

INTRODUCTION This flora represents my Colorado College research and fieldwork over the past three decades, building on that of my predecessors Jack Carter and Bill Penland and their students. Professors Carter and Penland built the modern Colorado College Herbarium out of its early phases of the late 1800's, and it was named in honor of Jack Carter in 1991. The Carter Herbarium now encompasses ca. 15,000 specimens, primarily from southeastern Colorado; this flora reflects not only what is vouchered here and my experience with the local flora, but also all that is known from additional herbaria with relevant collections from our area. These include herbaria of the University of Colorado, Boulder; Denver Botanic Garden, Colorado State University; and the University of Wyoming. I have also endeavored to track down and verify literature references to flora from this area in other non-regional herbaria. The first volume of this flora, entitled *Peak to Prairie: Botanical Landscapes of the Pikes Peak Region* (Kelso, 2012) provides an ecological and geological perspective for understanding the flora documented here. It also includes comments and perspectives on rarity and on weeds, both complicated issues. For practical reasons, the Pikes Peak region is arbitrarily circumscribed as including El Paso, Pueblo, Teller, and Fremont Counties. Our neighbors Elbert, Douglas, and Park Counties include some components of our flora, but have unique elements and biogeographic affiliations of their own that suggest the appropriateness of botanical separation.

The flora is as complete as can be achieved at this time from all herbarium and verified literature reports, although it does not include the grass or sedge families, but "complete" is a changing target and new additions are always in the pipeline as non-native species encroach and new discoveries are made. Grasses and sedges, the Poaceae and Cyperaceae, respectively, are large complex groups whose species are broadly distributed. They are treated comprehensively in other state-wide floras. The booklets by Janet Wingate from Denver Botanic Garden on grasses and sedges are particularly recommended for beginners; other information (including illustration) is available in Weber and Wittman: *Colorado Flora: Eastern Slope*, Culver and Lemly: *Field Guide to Wetland Plants*, and Ackerfield: *Flora of Colorado*. The information given here represents my own experience over the past decades with the plants of the Pikes Peak region, their distribution and their ecology. This information also reflects the contributions of all the plant explorers who have documented our extraordinary diversity and landscape since the early 1800's. They have all provided the foundations for this flora. Botanical colleagues at Fort Carson, the Air Force Academy, Peterson and Schriever Air Forces bases, the Forest Service, the National Resource Conservation Service and the Colorado Natural Heritage Program have also contributed enormously to our knowledge and documentation of the flora here.

This treatment includes the following: a guide to identifying plant families as traditionally recognized, utilizing not a key but a set of components that can be assessed relatively easily by beginners; for each family a treatment that includes a key to genera, and for each genus, a short description of known species (including main synonyms in play), with information on habitat and specific notes. I have deliberately chosen provide keys to the genera but not to species unless the species are complex enough to warrant detailed guidance. Keys have limited use since they depend heavily on a few characters that may not be available, and it is far better to look broadly and deeply at many aspects of any plant: all of its morphology, ecology, and "personality" as a biological entity. Keys can be shortcuts, but at the level of species can be too limiting and inhibit a multidimensional assessment of plant identity.

The name conundrum: changes, philosophies, and how to navigate them in the era of molecular genetics

Plant names and the philosophies about classification have always been problematic in botany. The botanists who develop them have individual field and laboratory expertise, and often different philosophies about splitting or lumping plant groups at any level (species, genera, and families) that are reflected in the names we apply. In the twenty first century, field expertise is in lesser supply than it once has been, and the tool of laboratory-based molecular genetics is very much on the rise. Molecular genetics is a powerful lens and has provided significant insights about relationships of species, genera, and families that once were guesswork at best. However, genetic analysis is not a single lens, but rather are many lenses, depending on the types and numbers of genes selected for analysis and how they are analyzed by computer programs. Different genes may provide different or conflicting perspectives, and any mode of showing species, generic, or familial relationships from them is not a uniform or easy process. Our molecular

perspectives are at best partial. Recently evolved plant groups may not yet have separated clearly or entirely from their relatives with respect to the genes assessed, and appear nested within other groups, leading to lumping. How much genetic separation merits a separate name for family, genus or species? What happens when morphology and ecology show clear separation, but our choice of genetic lens does not? Sometimes plant groups are clearly distinctive in one location, but not in another. And as has been long known, plants hybridize-their genetic boundaries are often porous, and this can now be shown genetically as well as morphologically. Plants “capture” each other’s genes relatively easily, and this genetic capture is not always visible on the living plant, but appears confusing and ambiguous in genetic analyses.

All of these issues, but especially some of the complexity surrounding how to apply genetic information, has led to a vexing time for botanists who seek stable, comprehensible names to apply. Families may appear to change radically (either by lumping or splitting, without easy to comprehend accompanying morphological substantiation), long established genera may disappear into others, or appear with a very different name resurrected from older treatments or developed de novo. Not surprisingly, botanists disagree with each other on how and when to apply names at all levels of plant diversity, and we yet we do need names for many reasons: to assess, document, or compare biodiversity at multiple levels, to reflect evolutionary pathways, and to show relationships, among others.

What to do? It helps to accept the inevitability of disagreement on names, and to realize that names will differ on the basis of different information, on philosophies about classification purposes, and what any botanist personally has studied about a group or a floristic area. Classification can reflect an evolutionary divergence still in progress, or it can reflect in-the-present differences in morphology or ecology that are important for our assessment of biodiversity. There is yet no universal truth for the parameters to apply for a biological name at any level, and so it helps to realize that names reflect a diversity of opinions, and may not be wrong in any concrete sense. For identification, it is important to use multiple floras, including their names and their descriptive information, and look at multiple sources to see what the options are. If it helps to separate out families that some botanists lump together, then do so. If it helps for a particular purpose to separate or lump genera together, follow that path. Look carefully at the characters used to distinguish, or not, species, and follow a path that is applicable for the needs of your study. Whatever the lumping or splitting, the use of any particular name should never diminish our appreciation of the multiple levels of biodiversity that exist on our landscapes, ever more threatened.

In this flora, the names applied and offered reflect options; they are a work in progress, offering options. Time may solidify some; additional information may diminish the validity of others. At best, these names reflect usable taxonomy with choices. They are intended for use with other floras, old and new; in the hope of making them compatible with earlier treatments, traditional familial names are generally used, with more recent “takes” offered. Suggested resources for additional opinions and useful (and different) perspectives include the following:

Web resources: www.plants.usda.gov (includes synonyms and names most commonly applied by federal agency botanists and the botanists who wrote Flora of North America treatments). It also has images.

Flora of North America project: large multivolume detailed analysis of plant species details for all of North America. Published by Oxford University Press with availability by family of online treatments.

Colorado Specific Floras:

Ackerfield, J. 2015. Flora of Colorado. BRIT Press, Fort Worth Texas

Carter, J.L. 2006. Trees and Shrubs of Colorado. Mimbres Publishing, Silver City, N.M.

Harrington, H.D. 1954. Manual of the Plants of Colorado. Sage Press, Denver, CO.

Weber, W. and R. Wittmann. 2012. Colorado Flora: Eastern Slope and Western Slope (2 vols.) University Press of Colorado.

PLANT CLASSIFICATION BASICS: A common (though not universally used) system of organization for plants, animals and fungi is a hierarchy of classification categories. You can remember these with the mnemonic *King Phillip Came Over For Good Spaghetti*. An example of classification for the common wild rose, one of our flowering plants, in the Anthophyta or Angiosperms, is shown here. The underlined endings indicate the category.

Kingdom: *Plantae*

Phylum: *Anthophyta* or *Magnoliophyta* (Flowering Plants)

Class: *Magnoliopsida* (Dicots) Note: the class for the Monocots is the *Liliopsida*

Order: *Rosales*

Family: *Rosaceae*

Genus: *Rosa*

Species: *woodsii*

The “scientific” name of a plant consists of the genus and species, and most field botany applications work just at the levels of family, genus and species. “Infraspecific” categories include varieties and subspecies; these may represent local differences in minor morphology or simply differences of opinion of botanists as to the status: one person’s subspecies may be another’s species. Varieties are usually lesser categories representing modest differences in size or color. The name or name of a person (e.g. L. for Linnaeus or A. Gray for Asa Gray) who first described the plant for science follows the species. This is called the “authority”, and is used generally for literature citations of a plant and on herbarium labels.

One of the most challenging exercises in botany is to try to key out a plant family for an unknown plant. Most botanical guides are organized by plant family and phylum, but family keys have to rely on some difficult technical characters such as number of ovarian locules that provide frustration even for experienced botanists. It is much easier to learn family recognition characters, and virtually all plant families have a few prominent features that identify them. These can either allow you to skip directly to a key within the family, or if you have to use a family key, make it much easier to navigate since family recognition makes it possible to eliminate families in the necessary choices. Once you can get to a family, or just a few possible family choices, finding the genus and then species is much easier. Many families have familiar “flagship” genera that are readily recognizable: these may be the “type” genus for the family (such as *Rosa* for the Rosaceae, or *Ranunculus* (buttercup) for the Ranunculaceae), or simply a familiar garden plant that exemplifies the family traits. As in human families, members of plant families usually show resemblances to each other, and these often can tip off the family placement. A good way to start is to make a “plant family notebook” with notes, pictures, pressings, and recognition hints that work for you.

To begin

Look very closely at the plant, all over, before you jump in and try to identify it via a key. Really look at it, and ask the following questions:

- Is the plant a gymnosperm or angiosperm, or a fern or fern ally?
- Is it woody or herbaceous?
 - Hint: woody plants (technically, trees and shrubs, those with permanent aboveground tissue) may be woody only at the base.
- Vining or not? Sprawling or erect?
 - Hint: Vining species may appear erect when young.
- Monocot or Dicot?
 - Monocots: parallel veins in leaves, flower parts in multiples of 3 (e.g. lily), Dicots: net veins, flower parts in multiples of 4 or 5
- Are the leaves opposite or alternate? Basal or off the stem?
- Where are the flowers? Terminal or in the leaf axils?
- What is the symmetry of the flowers? Radial (actinomorphic) or bilateral (zygomorphic)?
 - Hint: radial symmetry (think of a tire) is round when you look down on it and a flower can be cut in equal “pie” slices; bilateral symmetry (like a snapdragon) can only be cut 1 way in equal pieces

- What kind of inflorescence do you have? (learn the basic botanical terms for inflorescence types: simple, spike, umbel, etc)
- Pull apart a flower: what is the position of the ovary, superior or inferior?
 - Hint: a superior ovary has the sepals and petals attached below it; an inferior ovary (less common) has the sepals/petals attached above the ovary.
- Look at the male and female parts (anthers and stigma/style/ovary respectively). Are they both there? Is there anything unusual about them, for example, different looking anthers? What does the style look like?
- Is there anything unusual that you note about the plant? Odd smell? Spines? Sticky glandular? Milky or colored sap? Does it remind you of a familiar garden plant?

This list gives some quick hints in the form of short recognition characters for assessing plant families along with a familiar member that suggests the family “gestalt”, or overall character. If no common species is listed, the family is a small one with no familiar representative. Be sure to read more in the full description of the plant family in a key, and be aware that there are always exceptions! Plant identification is a science, but it is an art as well, where experience, observation, and sometimes just plain good guessing helps a lot. You can often use your sense of familiarity: “this reminds me of...” for productive results. It is highly recommended to learn the basic recognition features for our “big 20” families: these are the most abundant ones in Colorado and often important as garden plants as well. These families are marked in boldface in the list below. They are the traditional treatments-see text on the families for other options.

ANGIOSPERMS VS. GYMNOSPERMS

Gymnosperms are the easily recognized woody plants that reproduce by cones, not flowers and fruits. They have needles for leaves and as woody plants, are entirely perennial. We tend to think of them as the evergreen Conifers (though they are world wide a larger group than just our representatives and not all evergreen elsewhere). They include our pines, fir, spruce, and juniper. Angiosperms are the Flowering Plants, herbaceous and woody, that reproduce via flowers and various types of fruits. They are much more diverse than the Gymnosperms.

LOWER VASCULAR PLANTS FERNS AND FERN ALLIES

Botanists separate ferns and the plants we call the “fern allies” from other plant groups because they reproduce with *spores* instead of seeds via flowers; these groups (which include different phyla and families) are ancient, but at least in terms of longevity and distribution, very successful and common components of our landscape. Spores are minute reproductive bodies dispersed from special spore-bearing structures (*sporangia*) by wind; unlike seeds, they contain no nutritional tissue for the young plant embryo inside. While spore bearing plants were extremely common on earth millions of years ago, today only a few large groups, phyla (noted by the -phyta ending on the name), remain. In our region, these include the Equisetophyta (horsetails), the Lycophyta (club mosses), and the Pteridophyta (ferns). These are known collectively as the “lower vascular plants”; the horsetails and club moss groups are referred to as the “fern allies”. Although these phyla share a set of defining characteristics, they are evolutionarily independent lineages and have little relationship to each other. Their distinct evolutionary paths date back hundreds of millions of years.

ANGIOSPERMS: THE FLOWERING PLANTS

The flowering plants represent our broadest plant diversity. Although the flowers may be small, diverse in structure, or short-lived, their presence is the defining component of angiosperms. Seeds are produced in ovaries, which when ripe, are called fruits. Flowering plants represent many plant families. Learning basic plant structure and names of parts is critical to work with plant families, but once identification of a family or a few families is achieved, the rest is observation. Major plant families for our region are given in bold face, and learning to recognize these readily will make the process much faster. See also comments under each plant family, since family placement is variable now.

PLANT FAMILIES WITH WOODY MEMBERS (SHRUBS, SUBSHRUBS AND TREES)

Aceraceae: Opposite leaves, leaves simple or compound, fruit a samara. Example: maple

Anacardiaceae: Trifoliolate leaves, red berries (white if poison ivy) Examples: poison ivy, poison oak

Asteraceae: Flowers in a “head” inflorescence (ray and disk flowers as in a daisy, or just ray flowers like a dandelion, or just disk flowers like sage). This large, diverse and common family has both herbaceous and woody members. Examples: rabbitbrush, sagebrush

Berberidaceae: Holly-like leaves. Example: barberry

Betulaceae: Flowers in catkins, strong lenticels (white stripe-like structures) in bark, finely toothed leaf margins, tall shrubs along streams. Examples: birch, alder

Caprifoliaceae: Opposite leaves, paired or clustered flowers, short to medium shrubs.
Example: honeysuckle

Chenopodiaceae: Whitish scaly leaves, dry salty or alkaline areas. This family has herbaceous and woody members. Example: saltbush (woody species-see also under herbaceous families!)

Cornaceae: Opposite leaves, red stems, wet areas. Example: dogwood

Elaeagnaceae: Leaves with silvery scales. Example: Russian olive

Fabaceae: Compound leaves, fruit a pod. This family is large and diverse with both herbaceous and woody members that range from short shrubs to trees. Example: locust

Fagaceae: Lobed leaves, fruit an acorn. Example: oak

Frankeniaceae (1 species, a short shrub of dry barrens): Whorled, needle-like leaves.

Grossulariaceae: Lobed leaves, sometimes spiny, medium shrubs. Examples: current, gooseberry

Hydrangeaceae: Opposite, elliptical leaves. Example: mockorange

Oleaceae: Maple-like fruit (samara), trifoliolate leaves, trees or shrubs. Example: ash

Rhamnaceae: Leaves with 3 main veins, stamens opposite petals, short to medium shrubs.
Example: buckthorn

Rosaceae: White or pink 5-petalled flowers like an apple blossom, leaves with toothed margins, often with stipules (small leafy bract) along the petiole. Large and diverse family with many common representatives. Examples: rose, cherry, plum

Rutaceae: Trifoliolate leaves (single genus *Ptelea*, a medium sized shrub)

Salicaceae: Flowers in catkins, narrow leaves, occur always in moist areas, trees or medium or small shrubs. Example: willow, cottonwood, poplar, aspen

Solanaceae (1 woody genus): reflexed (bent back) petals, tubular flowers. A common family of the Southwest; most of our representatives are herbaceous. Example: tomato, pepper

Tamaricaceae (1 species): feathery divided leaves, pink flowers, medium shrub of wetlands, and streamsides. Example: tamarisk

Ulmaceae: Simple leaves with uneven, asymmetrical bases (one looks longer than the other). Example: elm

PLANT FAMILIES THAT ARE AQUATIC OR GROWING IN WATER

A. ***Dicots*** (Class Magnoliopsida: leaves with net veins; flower parts in 4's, 5's but often very tiny). The small-flowered aquatic families can be hard, especially without flowers or fruits. Check them all carefully!

Callitrichaceae: Tiny, delicate, linear leaves that are opposite.

Ceratophyllaceae: Dichotomous branching; looks like algae. Leaf segments have tiny teeth on the margins.

Haloragaceae: whorled pinnatisect leaves; flowers in clusters

Hippuridaceae: Whorls of short, blunt leaves

Hydrocharitaceae: Whorls of broad leaves.

Lemnaceae: Small clusters of bright green leaves, look like floating mats. Common in stagnant shallow water. Example: duckweed

Polygonaceae: Sheathing stipule at leaf base, pinkish or whitish flower spikes. Diverse family, with many representatives. *Persicaria* (also known as *Polygonum*-smartweed) is the most common aquatic representative. Examples: dock, rhubarb

Potamogetonaceae: Leaves long, ribbony and narrow or wider, sometimes different in submerged and emergent leaves.

Ranunculaceae: With narrowly divided leaves; 5-petalled yellow or white flowers. A large and diverse family, with just a few truly aquatic representatives. Example: buttercups

Sparganiaceae: Lumpy inflorescence, becoming fruits resembling WWII mines

Zannichelliaceae: Opposite, linear leaves, with a sheathing stipule (rare)

B. **Monocots** (Class Liliopsida: leaves with parallel veins, flower parts in 3's or multiples of 3's)

Typhaceae: Long strap shaped leaves, terminal brown structure resembling bratwurst. Example: cattail

Alismataceae: Plantain (the dicot *Plantago*) shaped leaves, more often arrowhead shaped, stems and leaves spongy to feel. Example: arrowhead

Pontederiaceae: (rare): flowers with 6 tepals (petals and sepals look alike) and 3 stamens, blue or yellow
Examples: water hyacinth, pickerelweed

DICOT FAMILIES WITH VINING SPECIES (young plants may not yet twine and appear erect-
look for curly stem endings if in doubt)

Anacardiaceae: white berries, leaves trifoliolate. Examples: poison ivy, poison oak

Cannabaceae: broad leaves, usually compound, dioecious (male and female plants)
Examples: hops, marijuana

Convolvulaceae: Twining, twisting, tubular showy flowers. Examples: morning glory

Cucurbitaceae: big broad leaves, sprawling plants. Examples: pumpkin, gourds

Cuscutaceae/Convolvulaceae (few species): parasitic, orange stems covering another plant species.
Example: dodder

Fabaceae: blue, purple or white flowers, compound leaves, fruit a pod.
Example: peas

Polygonaceae: Twining stems or sprawling on ground, small, nonshowy flowers, sheathing stipules on leaves. Example: silverlace vine, black medic

Ranunculaceae: Trifoliolate leaves (vine species only), showy sometimes 4-petalled flowers, may appear erect when young. Example: clematis

Smilacaceae: Dioecious, blue-black berries, climbing on other shrubs. Example: greenbriar

Vitaceae; broad leaves, climbing. Example: grape

TERRESTRIAL MONOCOT FAMILIES

(leaves with parallel veins, flower parts in 3's or multiples of 3's)

Agavaceae: sharp pointed spearlike leaves. Example: yucca

Asparagaceae (1 genus) feathery leaves. Example: asparagus

Commelinaceae (few rare species, 1 common 1): blue or white showy flowers

Iridaceae: inferior ovaries, pointed long leaves, fruit a capsule. Example: iris

Liliaceae: superior ovaries; simple basic monocot flowers with radial symmetry, not always having distinctly different sepals and petals. In large sense a diverse family, many botanists split this into multiple smaller ones! Example: lily

Orchidaceae: inferior ovaries, complex bilateral symmetry in the flowers. We have few showy representatives like lady's slipper, most of ours are small and very nondescript, often greenish white spikes.

See also Typhaceae (wetlands) and Smilacaceae (vining plants).

"GRAMINOIDS": GRASSLIKE PLANT FAMILIES

(Learn the specialized flower structures and terminology on these, especially for Juncaceae and Poaceae)

Cyperaceae: sedges; triangular stem ("sedges have edges"); includes sedges and some related genera—usually but not always in wetlands. Learn what a *perigynium* looks like—this is a key reproductive character. Not treated in this flora.

Juncaceae: rushes; round stem; flowers look like simple monocot flowers—always in wet areas (though sometimes just subsurface water). Look like tiny monocot flowers, parts in 3's, reproductive structure is a small capsule

Juncaginaceae: salt marsh species; flowers in clusters, often spikes, at top

Poaceae: true grasses; stems round; wet and dry areas! Not treated in this flora.

TERRESTRIAL HERBACEOUS DICOT FAMILIES

(net veins on leaves, flower parts in 4's or 5's)

Adoxaceae (1 species): 4-parted greenish corolla; small inconspicuous plants

Aizoaceae (1 species): low, sprawling succulent plants with opposite leaves

Amaranthaceae: disturbed areas, small, indistinct greenish flowers with papery floral parts. Example: amaranth

Apiaceae: inflorescence in an umbel, leaves divided usually, often aromatic, flowers small, 5-parted, ovary inferior. See also Araliaceae as a somewhat lookalike! Examples: carrots, parsley, cilantro, dill

Apocynaceae: milky juice, opposite leaves, small bell-like flowers. See also Asclepiadaceae

Araliaceae (1 species): can look somewhat like Apiaceae, but flowers with 4 parts, fruit a berry, not aromatic

Asclepiadaceae: milky juice, opposite leaves, flowers in multiple clusters, highly modified. Example: milkweed

Asteraceae: Huge family, diverse: learn the flower types (ray and disk: some species have both (daisy), some have ray only (dandelion), some have disk only (sage).
Examples: dandelion, sunflower, sage, daisy

Balsaminaceae (1 species): wetland, leaves shiny underwater
Example: jewelweed

Boraginaceae: 4-lobed ovary that divides in fruit, often with hooks on them, flowers radially symmetrical, blue or white, plants often hairy, leaves alternate. Examples:
borage, forget me not, chiming bells

Brassicaceae: 4-parted (cross-shaped) flowers, fruits either short and squat or long and thin; (see also Capparaceae, a look alike). Examples: radish, mustard

Cactaceae: succulent, spiny. Examples: prickly pear, cholla

Campanulaceae: bell shaped purple or blue flowers (or white); some also bilaterally symmetrical (*Lobelia*) and look like Scrophulariaceae. Example: harebells

Capparaceae: Long fruits like Brassicaceae, but flowers with long exserted stamens, often sticky or smelly (few species)

Caryophyllaceae: flower parts in 5's, often pink or white, opposite leaves, swollen nodes where leaves connect. Examples: garden pink, bouncing bet

Chenopodiaceae: disturbed areas, inconspicuous greenish flowers, leaves somewhat geometrical in shape, often with a whitish scaly covering (farina). Example: spinach

Cistaceae (1 rare species): unbranched wiry stems, 1 terminal yellow flower

Convolvulaceae: mostly twining species with showy flowers like a short trumpet; some are small and inconspicuous and not twining. Example: morning glory

Crassulaceae: succulent, non spiny plants, typically upright. Examples: sedum, portulaca

Dipsacaceae (1 species): Very tall, prickly species of wetlands; flowers violet, in tight heads, leaves in whorls around the stem. Example: teasel

Ericaceae; leathery, ovate leaves, acid soils, bell-shaped flowers. Example: blueberry

Euphorbiaceae: milky juice (some, not all); flowers often lacking petals and having bracts that are petal-like, often growing in disturbed areas. Example: poinsettia

Fabaceae: compound leaves, flowers papilionoid (in our species) fruits a pod. Examples: pea, bean, lupine, clover

Fumariaceae (2 species): flowers yellow, leaves blue green, fruit curved pods like a pea pod. Example: Dutchman's britches

Gentianaceae: Purple or blue flowers, sometimes green or white, fringed lobes sometimes on flowers. Typically blooms late in the summer (except for *Frasera*, green gentian).

Geraniaceae: Purple, pink or white 5-parted flowers, characteristic "crane's bill" fruit. Example: geranium (horticultural species is the genus *Pelargonium*).

Hydrophyllaceae: Coiled helical inflorescence that straightens out when mature, sometimes sticky, flowers delicate, with long exerted anthers, occur in gravelly soils

Hypericaceae: Yellow flowers, opposite leaves with translucent dots when held to the light. Example: St. John's wort

Lamiaceae: square stems, opposite leaves, often aromatic (not always!), bilaterally symmetrical pink, white, or purple flowers with a 4-lobed ovary. Examples: mint, catnip

Linaceae: delicate blue or yellow 5-petalled flowers. Example: flax

Loasaceae: Velcro-like feel to the leaves; often showy yellow or cream flowers that close during the day and open in early evening.

Lythraceae (few species): similar appearance to Lamiaceae and Scrophulariaceae, with bilaterally symmetrical flowers, wetlands. Example: loosestrife

Malvaceae: column of united stamens fused to and surrounding the female portions. Example: hollyhock

Martyniaceae (1 species): bilaterally symmetrical flower, unusual fruit that looks like an elephant head with curving tusks

Molluginaceae (1 species): prostrate annual, whorled leaves (see also Caryophyllaceae)

Nyctaginaceae: unusual papery "skirt" below the flowers (an involucre). Examples: four o'clock, bougainvillea

Oleaceae (1 herbaceous species, also woody species): yellow flowers, narrow leaves, fruits with 2 rounded lobes and a lid that pops off to release the seeds.

Onagraceae: flowers 4-petalled like Brassicaceae but with an inferior ovary; fruits long and slender, splitting along 1 side. Examples: fireweed, evening primrose

Orobanchaceae (in traditional narrow sense): pale green to whitish, parasitic on Asteraceae, spike of bilaterally symmetrical flowers

Oxalidaceae: leaves like clover or shamrock, flowers pink or yellow

Papaveraceae: delicate papery almost translucent petals, lobed leaves, milky juice. Example: poppy

Plantaginaceae (in traditional narrow sense): cluster of basal leaves, spike of inconspicuous flowers with papery corollas

Polemoniaceae: trumpet shaped flowers, 3 styles. Example: phlox

Polygonaceae: papery sheath at the base of the leaf, small papery "skirt" around the corolla in *Eriogonum* (buckwheat), 3-lobed fruits. Examples: rhubarb, dock

Portulacaceae: plants succulent, flowers delicate, small, often pink or white or yellow. Examples: purslane, portulaca

Primulaceae: flowers pink, rosy purple, or white, stamens opposite petals, short or long corolla tube. Examples: primrose, shooting star

Pyrolaceae: leaves broad and leathery, flowers waxy. Examples: wintergreen

Ranunculaceae: very diverse, 3 pistils with hooked spur on top. One group (Hellebore group) has follicle fruits, includes a number of floral morphologies with spurs.
Examples: columbine, monkshood, delphinium.
The Ranunculus group has achene fruits, flowers with radial symmetry and typically shiny yellow or white petals; usually prefers moist soils. Examples: buttercup, anemone

Resedaceae (1 uncommon species): 1-sided flowers with many stamens on one side and cleft petals.

Rosaceae: 5 separate petals, 5 separate sepals, many stamens, many styles. Leaves often toothed on the margins. Examples: raspberry, strawberry

Rubiaceae: square angled stems with whorled leaves; flowers tiny, ovary inferior. Examples: bedstraw

Santalaceae (1 species): leaves pale green, roots blue in cross section, parasitic on plains grasses or sage.

Saxifragaceae: flowers with 5 separate petals and 5 sepals, pistil with 2 styles growing swollen in age to resemble a jester's cap or old-fashioned oil and vinegar cruet.
Leaves extremely variable. Example: saxifrage

Scrophulariaceae: (older inclusive sense-now split to several different families) opposite or alternate leaves, flower usually bilaterally symmetrical, sometimes radial, sepals partly united, 4 stamens in 2 pairs, ovary not lobed. Examples: snapdragon, mullein

Solanaceae: reflexed petals and protruding anthers, sepals and petals united, flowers often white or yellow.
Examples: potato, tomato, pepper

Urticaceae (few species): stinging hairs, toothed leaves, tiny white or greenish flowers.
Example: nettle

Valerianaceae: compound leaves, flowers in umbels, fruits with plumose hairs at the top.

Verbenaceae: similar to mints with opposite leaves and bilaterally symmetrical flowers but lacking an odor, flowers bilaterally symmetrical. Example: verbena

Violaceae: heart-shaped leaves, flowers irregular. Example: violet, pansy

Zygophyllaceae (few species): hard, spiny or tuberculate fruits, sprawling. Example: caltrop

GYMNOSPERMS

The term "gymnosperm" means "naked seed", and refers collectively to a group of plant families where the seeds are not enclosed in ovaries as they are in the "angiosperms" or flowering plants, but rather carried "naked" on the scales of cones or cone-like structures. In our region, the gymnosperms include the familiar conifers in the family Pinaceae, and the Junipers (called "cedars" by some in other parts of the country) in the Cupressaceae.

Key to the Families

1. Plants with woody cones, scales carrying seeds on the upper surface; leaves needle-like, separate or in bundles.....Pinaceae
1. Plants with blue-gray "berries", actually cones with fused scales fused; leaves flat and scale-like or sharp-pointed needles.....Cupressaceae

Cupressaceae: Juniper Family

The Juniper or Cedar Family is relatively restricted here with respect to species diversity, although all our junipers are common. Singleseed juniper forms a dominant community type that can be seen in Fremont and Pueblo Counties, as well as in the Garden of the Gods in Colorado Springs. The junipers are typically called "cedar" in other parts of the country, the eastern "cedars" are also the genus *Juniperus* but true cedars fall into *Cedrus* of the Mediterranean region or into *Chamaecyparis* in the Pacific Northwest.

Juniperus "juniper, cedar"

Juniperus communis L. ssp *alpina* (J. E. Smith) Celakovsky

Syn. *Juniperus sibirica*

Plants low sprawling shrubs, needles sharp, awl-shaped and bi-colored, appearing white above and green below.

Habitat: Foothills, montane, and alpine zones, often occurring as an understory shrub in conifer forests

Notes: Extremely common throughout our region, from the foothills to the tundra. Look for the low growth and very sharp leaves. This is our "common juniper".

Juniperus monosperma Engelman

Syn. *Sabina monosperma*

Plants small trees, needles yellowish-green in color and appearing as overlapping scales.

Habitat: Foothills around Colorado Springs, especially around the Garden of the Gods but uncommon north of there; abundant throughout the foothills and mesas of Pueblo and Fremont Counties.

Notes: This species, "single seed juniper" is a common associate of pinon pine throughout southern Colorado and New Mexico and forms a dominant community type there called the Pinon Pine-Juniper ("P-J") Woodland. In our region, it is most common in the southern portion of El Paso County and throughout Fremont and Pueblo Counties. Although it only occasionally grows with *Juniperus scopulorum*, the two species are easily distinguished by their different aspect and coloration (step back about 10 feet!).

Juniperus monosperma has a yellow-green cast to it, and a rounded, almost egg-shaped appearance while *Juniperus scopulorum* has a deeper green color, and more pointed, Christmas-tree like appearance. It grows at higher elevations and in cooler locations than *J. monosperma*.

Juniperus scopulorum Sargent

Syn. *Sabina scopulorum*

Plants small to medium-sized trees, needles deep blue-green in color and appearing as overlapping scales.

Habitat: Foothills and montane throughout the Pikes Peak region.

Notes: "Rocky Mountain juniper": occurs throughout the foothills and montane zones, and occasionally in cooler sites on the mesas and rocky outcrops around Colorado Springs and the northern portion of El Paso County. It prefers cooler, moister locations, and is common in foothills canyons, especially on north-facing slopes. See discussion under *J. monosperma* for tips on how to distinguish these species. In some areas, Rocky Mountain juniper and singleseed juniper appear to hybridize where they co-occur.

Pinaceae: Pine Family

The Pine family includes our dominant tree species that form the conifer forests of the foothills and the montane. The genera are easily distinguished by the type of needles and by the cones.

Key to the Genera

1. Needles in bundles at the base.....*Pinus*
1. Needles not in bundles..... 2
2. Needles quadrangular (with edges when rolled between the fingers), sharp to the touch..... *Picea*
2. Needles flat, not sharp to the touch.....3
3. Needles stalked, cones hanging down, scales persistent, with distinctive 3-cleft bracts... *Pseudotsuga*
3. Needles not stalked, cones erect, scales deciduous, lacking 3-cleft bracts..... *Abies*

Abies "fir"

Abies concolor (Gordon & Glendower) Lindley ex Hildebrand

Plants small to medium-sized trees, needles 2-3 inches long, with a whitish blue-green coloration.

Habitat: Foothill and montane canyons

Notes: The Colorado Springs region marks the northern extent of this species, known as "white fir", which is otherwise common throughout southern Colorado and New Mexico. It prefers cool moist canyons with permanent water or seeps. Look for the distinctive long flat needles with a pale color. It is sometimes planted horticulturally as it is a very attractive species.

Abies lasiocarpa (Hooker) Nuttall

Syn. *Abies bifolia*

Plants medium-sized trees, needles less than 1 inch long, deep green in color.

Habitat: Subalpine and lower tundra slopes

Notes: Although "subalpine fir" is extremely abundant throughout the rest of Colorado, often forming the co-dominant species of the subalpine "spruce-fir" zone, in the Pikes Peak region this species is rare, reported only as occasional individuals in isolated locations on Pikes Peak. The low rainfall and snowpack coupled with our crumbly granitic soils that do not hold water may prevent it from occurring here. It has short, deep green needles that resemble those of Douglas fir (*Pseudotsuga douglasii*), but the cones do not have the distinctive bracts of that common species.

Picea "spruce"

Picea engelmannii Parry ex Engelmann

Plants medium to tall trees; cones usually only up to 3 in long, needles darker green in color.

Habitat: Foothills, montane and lower alpine zones

Notes: Although Engelmann spruce is the dominant species of our subalpine forests where it forms large uniform stands, it can also occasionally occur at lower elevations as isolated individuals on north-facing slopes and in canyons. It typically has a deeper green color than blue spruce, and usually grows above 10,000 ft. However, in cool canyons, hybrid swarms ("blengelmann spruce") of the two species often coexist, especially from 8-10,000 feet.

Picea pungens Engelmann

Plants medium-sized trees, cones usually over 3 in long, needles usually somewhat bluish in color.

Habitat: Foothills and lower montane zone.

Notes: Blue spruce typically occurs as isolated individuals and in small patches in the lower foothills canyons around Colorado Springs, and is most common at elevations between 8-10,000 feet. See discussion

under Engelmann spruce about hybrids: in many locations; in canyons it may be sometimes difficult to distinguish the two species. Blue spruce is often planted as a cultivar around homes.

Pinus "pine"

Pinus aristata Englemann

Plants small trees or appearing as dwarfed shrubs, especially at timberline. Needles in bundles ("fascicles" of 5), less than 2 in long, curved, with prominent white resin drops.

Habitat: Subalpine and tundra, sometimes into the montane zone in cool, moist canyons of the foothills.

Notes: The "bristlecone" pine is our highest elevation pine, and individuals can grow to over 1000 years old. It occurs at the higher elevations on Pikes Peak, sometimes over 13,000 feet in protected areas among boulders. Timberline individuals are often stunted and dwarfed, and appear as shrubs in comparison to those growing at lower elevations which characteristically take on a more symmetrical, tree-like appearance. Look for the white-resin drops on the needles.

Pinus contorta Douglas ssp. *latifolia* (Englemann) Critchfield

Plants tall, slender trees, with an appearance of a branched telephone pole. Needles in bundles of 2-3, less than 4 in long, somewhat yellowish green in color.

Habitat: Montane or lower subalpine.

Notes: "Lodgepole" pine is rare in our region, although a few individuals have been reported historically from Pikes Peak and Teller County, and occur now in parts of the Rampart Range north of Woodland Park. It begins to become quite common along the Palmer Divide at the Douglas County line. As with subalpine fir, it may be that our dry climate and poor soils preclude it from growing here as abundantly as it does elsewhere in Colorado.

Pinus edulis Englemann

Plants short trees, appearing rounded and bushy. Needles in bundles of 2-3, less than 2 in long.

Habitat: Mesas and lower foothills.

Notes: See comments under *Juniperus monosperma*. The piñon pine forms a dominant ecosystem type to our south, and the species is particularly common in Pueblo and Fremont Counties, especially on ridges and low mesas. In El Paso County, piñons are uncommon north of the Garden of the Gods, but can occur sporadically on the mesas and in the lower foothills.

Pinus flexilis James

Plants medium to short trees, branches very flexible, often contorted. Needles in bundles of 5, less than 3 in long.

Habitat: Foothills, montane and lower subalpine zones, often on windy, rocky or exposed sites.

Notes: The "limber" pine is well-adapted to difficult growing conditions, and its twisted, gnarly appearance can be striking. It tolerates more extreme conditions than ponderosa pine, and often replaces that species on ridgetops or in exposed, rocky habitats. Look for the very flexible branches.

Pinus ponderosa Douglas ssp. *scopulorum* (S. Watson) W. A. Weber

Plants tall trees, becoming broad and stately in age and in fire-maintained forests, but often spindly and stunted in areas such as the Black Forest where fires have not occurred for some years. Needles in bundles of 2-3, 5-7 in long.

Habitat: Foothills and montane zones, higher elevations and ridges on the plains.

Notes: The ponderosa pine is our dominant tree species in the foothills, especially on south-facing slopes. It forms wide expanses throughout Teller County and higher elevations in Fremont County. It is easily distinguished by its long needles and size. Mature healthy ponderosa stands are becoming rare in the Pikes Peak region. Ponderosas are often attacked by mistletoe (*Arceuthobium vaginatum*), a parasitic vascular plant that invades the vascular tissue, disrupts meristematic activity, and ultimately creates a "witches broom" effect.

Pinus strobiformis Englemann

Plants tall straight trees with little branching. Needles in bundles of 5, less than 3 in long, cones long and narrow.

Habitat: Foothills.

Notes: The presence of *P. strobiformis*, Mexican white pine, is somewhat controversial in Colorado and in the Pikes Peak region, where trees resembling this species have been found in Phantom Canyon outside Cripple Creek. It is difficult to distinguish *P. strobiformis* from *P. flexilis* except by growth habitat, which can be misleading since this can strongly affected by environmental conditions. *P. strobiformis* is a straighter tree than typical *P. flexilis*, and the cones are longer and more narrow. For the present, the identification of *P. strobiformis* in our region remains tentative pending genetic confirmation.

***Pseudotsuga* “Douglas fir”**

Pseudotsuga menziesii (Mirbel) Franco

Plants tall or medium sized trees. Cones with persistent scales, containing distinctive 3-pronged bracts.

Habitat: Foothills and montane, often on north-facing slopes.

Notes: While our “Douglas fir” is only a shadow of its large majestic relatives in the Pacific Northwest, these trees are common component of our foothills and montane forests. In the canyons, they dominate the north-facing slopes, where they often occur with *Abies concolor*, white fir. Firs (the genera *Abies* and *Pseudotsuga*) both have flat needles, but *Pseudotsuga* can always be distinguished by its cones with 3-pronged bracts.

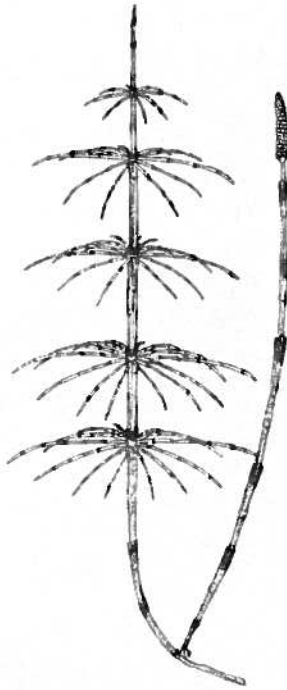
FERNS AND FERN ALLIES: AN OVERVIEW

In our region, these include the Equisetophyta (horsetails), the Lycophyta (club mosses), and the Pteridophyta (ferns). These are known collectively as the “lower vascular plants”; the horsetails and club moss groups are referred to as the “fern allies”. Although these phyla share defining characteristics (presence of a vascular system with xylem and phloem, reproduction by spores), they are evolutionarily independent lineages with distinct evolutionary paths dating back hundreds of millions of years.

EQUISETOPHYTA: HORSETAILS, SCOURING RUSHES

Equisetaceae: Horsetail Family

The members of the last remaining group in the Equisetophyta belong to one or two genera: *Equisetum* and *Hippochaete* (which many botanists include in *Equisetum*). Although not diverse in species, the horsetails are common in most moist terrestrial environments. The scale-like leaves are borne in whorls and the thin branches, when present, follow the same circular growth pattern. Their stems have characteristic teeth at the joints and contain silica granules that give them a gritty feel and provide the botanically inappropriate common name of “scouring rush”. True rushes (family Juncaceae, in the Flowering Plants) are seed-bearing, and lack the jointed stems. Horsetails generally indicate subsurface moisture, and are often found along stream banks. Our species are distinguished by characteristics of the teeth that occur at the stem joints and by aspects of the ridges on the stems. Look carefully with a hand lens or microscope to see the differences. Spores are born in cone like sporangia called “*strobili*” (singular, *strobilus*) that occur at the top of the stem; certain aspects of the strobili can help in identification.



Drawing by M.
Schurman

Key to Equisetum

- 1. Plant with branched stem (branches in whorls at nodes).....2
- 1. Plant lacking branched stem.....3

- 2. Plants with green, sterile, four-angled fronds and brown fertile stems with terminal cone. Teeth in whorls of 3-6.....*E. arvense*
- 2. Plants with green, branching, sterile, three-angled fronds and brown fertile stems with spores in terminal strobilus. Teeth in whorls of 8-15..... *E. pratense*

- 3. Plants with stout, many-angled stems..... 4
- 3. Plants with slim, few-angled stems. Strobilus borne on a thin stalk extending from the top of the stem and subtended by a papery sheath. Sheaths loose, with fine-pointed teeth.....*E. variegatum*

- 4. Sheaths with dark band at base. Clusters of sporangia on strobilus with a whitish, crystalline appearance.....*E. hyemalis*
- 4. Sheaths lacking dark band at base. Clusters of sporangia on strobilus with yellow cast ...*E. laevigatum*

***Equisetum* “horsetail”**

***Equisetum arvense* L.**

Plants with green, branching, sterile 4-angled fronds and brown fertile stems containing spores in strobilus on top. Teeth in whorls of 3-6.

Habitat: Moist areas, all elevations; very abundant.

Notes: The fertile fronds wither soon, while the green photosynthetic fronds last throughout the year.

***Equisetum hyemale* L.**

Syn. *Hippochaete hyemalis*

Plants with stout stems; stems many angled, sheaths with a dark band at the base; strobilus terminal.

Habitat: Wet areas, streamsides, ditches

Notes: Look for the stout stem with the dark bands on the sheaths.

***Equisetum laevigatum* A. Braun**

Syn. *Hippochaete laevigata*

Plants with relatively stout stems, stems many angled, sheaths lacking dark bands.

Habitat: Wet areas, streamsides, ditches.

Notes: Similar to *E. hyemalis*, but lacking dark bands and having a more rounded cone on top.

***Equisetum pratense* L.**

Plants with green, branching, sterile, 3-angled fronds, and brown fertile stems containing spores in terminal strobilus. Teeth in whorls of 8-15.

Habitat: Moist forests, higher elevations.

Notes: Known from Fremont County.

***Equisetum variegatum* Schleicher**

Syn. *Hippochaete variegata*

Plants with relatively slender stems, stems few angled, sheaths loose, with fine-pointed teeth.

Habitat: Sandbars in streams and along banks.

Notes: The smallest and most delicate of our horsetails.

LYCOPODIOPHYTA: CLUB MOSSES, SPIKE MOSSES AND QUILLWORTS

Once dominant in the swamp forests of the Paleozoic Era but becoming less and less diverse as their habitat disappeared on a changing Earth, this phylum has a small number of surviving genera. Only three - *Lycopodium*, *Selaginella*, and *Isoetes* – remain in our area. Each has its own family: Lycopodiaceae, Selaginaceae, and Isoetaceae. Typical features of this group overall include small, single-veined leaves arranged either spirally or in pairs and sporangia borne in cones or leaf axils. Their superficial resemblance to mosses gives them the common name for the phylum; true mosses, the Bryophyta, lack conducting tissue of xylem and phloem and do not have true leaves or roots.

Lycopodium: With 200-400 species worldwide, this genus is common around the globe from tropical to arctic habitats. It has not been found in the Pikes Peak region, although it can be found in other cool, moist high altitude regions of Colorado. A second genus related to *Lycopodium* that some botanists recognize as a separate entity is *Huperzia*. If it occurs here, it would be on rocky cirque walls of Pikes Peak; these are difficult to survey and thus far, no collections of *Huperzia* have been found in our area. It does occur to our west, in the mountains near Buena Vista.

Selaginellaceae: Spikemoss Family

Selaginella is the most moss-like in appearance of the phylum. Unlike *Lycopodium*, *Selaginella* is heterosporous – it produces two sizes of spores, megaspores (a female type) and microspores (a male type). *Selaginella* has a small flap of tissue at the base of the leaf above the sporangia called the *ligule*; this is not found in *Lycopodium*. *Selaginella* leaves are minute and overlapping. Leaf characteristics that distinguish species are hard to see with the naked eye, but a hand lens or microscope can reveal different attributes of color and hair points. More than one species can occur in a single mat, and it is not uncommon to find true mosses growing in the mat as well. *Selaginella* is very diverse in the Southwest; this is a drought tolerant group that can withstand long periods of dessication and thrive on rock walls with only sporadic moisture, quickly rehydrating when it gets moisture. On canyon walls, the mats can form large, dripping carpets that are quite spectacular when they hang off nearly vertical cliffs. Look for all our species in the foothills canyons, especially on north-facing sandstone or granitic cliff faces where they drape over the rocks.

Selaginella “spikemoss”

Key to *Selaginella*

1. Plants growing in short tufts or clumps, not in mats.....*S. weatherbiana*
1. Plants growing in mats.....2
2. Plants deep green in color, leaves with a white hairpoint, curved outwards.....*S. underwoodii*
2. Plants grey green in color, leaves with or without a hairpoint.....3
3. Leaves blunt, lacking a hairpoint at the tip, but ciliate margined below.....*S. mutica*
3. Leaves with a white hairpoint at the tip, curving upwards, lacking cilia.....*S. densa*

Selaginella densa Rydberg

Plants matted, with grey green leaves, thick, grooved, and curling upward and ending in a white hairpoint at the tip.

Habitat: Canyon walls and moist rock faces in the foothills, open soil on lower elevation ridges of plains and mesas.

Notes: Common throughout our region; most similar to *S. underwoodii*, but leaves more grey green and curving upwards rather than outward.

Selaginella mutica D. C. Eaton

Plants matted, with thick, grooved leaves, ciliate margined with short stiff hairs, and blunt at the tip, lacking a hairpoint.

Habitat: Canyon walls and moist rock faces in the foothills

Notes: Common throughout our region

Selaginella underwoodii Hieronymus

Plants matted with thick, grooved leaves ending in a white hairpoint tip, but differing from *S. densa* in that they curve more out than up, and are deep green rather than grey green in color.

Habitat: Canyon walls and moist rock faces in the foothills

Notes: Common; compare with *S. densa*. Look for the outward curving leaves.

Selaginella weatherbiana Tryon

Plants growing in short, erect clumps rather than mats where stems root at the nodes. Leaves green, curving inwards somewhat.

Habitat: Granitic canyon walls

Notes: Less common than other species here, but not rare. Occurs most frequently in the warmer canyons of Fremont and Pueblo Counties.

Isoetaceae: Quillwort Family

The least diverse of the lycophyte genera is *Isoetes* (quillwort), with approximately 75 species worldwide, only three of which have been found in eastern Colorado. An almost aquatic genus, *Isoetes* likes wet, muddy areas and can grow submerged. A defining trait for the genus is the strap-shaped leaves, which resemble chives or a short, tufted grass. *Isoetes* has been found on Pikes Peak in an area now much modified by reservoir construction. It remains extant in one of the least modified lakes, and may also exist on the higher ponds and wetlands as well.

Isoetes setacea Lamarck

Plants growing in short tufts less than 10 cm, resembling chives, leaves somewhat recurved, spores spiny.

Habitat: Known from the south side of Pikes Peak, in a high montane/subalpine lake with shallow water.

Notes: Difficult to find, as it typically grows underwater and may be mistaken for algae. Look in pond edges for tufted plants attached to the bottom.

PTEROPHYTA: FERNS

The ferns belong to a diverse phylum that originated in the Devonian period almost 400 million years ago. Today there are at least 10,000 surviving species; while many ferns prefer shady forests and moist areas, desert and aquatic ferns exist as well. Ferns typically possess large divided leaves called *fronds*, where the divisions are called *pinnae*. They grow off rhizomes. Ferns are also recognizable by their development; when plants are young, adaxial (top) shoot cells elongate faster than abaxial (bottom) shoot cells, creating a distinctive downward curvature. This process, called “fiddleheading” in the vernacular, is “*circinate vernation*” to botanists. Fern spores are produced in sporangia that are usually grouped on the undersides of pinnae into clusters called *sori* (singular: *sorus*). Not all fern species have sori – some like the cinnamon fern have separate structures for leaves and sporangia. In sorus-bearing species, sori are protected by a flap of leaf tissue called an *indusium*. Alternately, sori grouped near a pinnule edge may be enfolded by the pinnule margin; this form of protection is called a *false indusium*.

Key vocabulary:

- *Blade*: the broad part of a leaf.
- *Circinate vernation*: A distinctive growth pattern in ferns in which adaxial (upper) cells elongate more quickly than abaxial (bottom) cells, creating downward curvature in the plant.
- *False Indusium*: A folded pinnule margin protecting sori.
- *Fron*d: A large, divided leaf.
- *Indusium*: A small flap of leaf tissue protecting sori.
- *Pinnule* (pl. *pinnae*): The smallest pinnate division of a pinnately compound leaf.
- *Rachis*: The main axis of a structure (e.g. the leaf).
- *Rhizome*: A horizontal subterranean stem.
- *Sorus* (pl. *sori*): A cluster of *sporangia*.
- *Stipe*: A stalk supporting a structure; in this case, a stalk supporting a leaf blade.

The plants known collectively as ferns represent a diverse collection of plant families, although previously all ferns were placed in a single family, the Polypodiaceae. Modern research has shown that ferns demonstrate such genetic, morphological, and ecological differences that multiple families are justified. Although the classic fern "profile" is well known, this can be misleading, and many botany students have been fooled by such families as Apiaceae where leaves can look very "fernlike", or such genera such as *Castilleja* (Scrophulariaceae) where some species have divided fernlike leaves. Equally, some of the true ferns don't look like our common conception of ferns: for example, *Marsilea* resembles a four-leaf clover, and *Asplenium septentrionale* looks like a grass. Since ferns can be deceptive, it may be helpful to look for their diagnostic reproductive structures. Since many of the characters that separate families and genera of ferns are minute, it is almost always necessary to use a hand lens or microscope to do fern identifications, at least in the smaller species.

KEY TO FERN FAMILIES (See alternative names also)

1. Leaves with distinct petioles and appearing like 4-leaf clover; spores born at the base of the plant in round clusters, plants of wet habitats and ephemeral ponds on the plains**Marsileaceae**
1. Leaves not as above, plants of moist or seasonally dry habitats.....2
2. Fronds linear, undivided except for a few inconspicuous forks at the tip..... **Aspleniaceae**
2. Fronds not as above.....3
3. Fronds not all alike, some branches modified for reproduction only and carrying spore clusters4
3. Fronds all alike, spores not born on separate branches.....5
4. One branch of each frond carrying spores only.....**Ophioglossaceae**
4. Fronds of two distinct kinds, one sterile and yellow green, the other photosynthetic and green
.....**Pteridaceae** (*Cryptogramma*)
5. Edge of frond clearly curving over the sori; plants commonly hairy, scaly, or with a waxy coating beneath.....**Pteridaceae**
5. Edge of frond flat or indistinctly curled, or if curled, then plants lacking prominent hairs, scales or wax...
.....6
6. Fronds with lower branches equal in size to main branch or appearing as if facing forward.....7
6. Fronds not as above.....8
7. Fronds tall and coarse, sori born on inrolled edges of the pinnae.....**Dennstaedtiaceae**
7. Fronds not tall and coarse, sori on flat surface of the pinnae, indusium covering sori crescent shaped
..... **Dryopteridaceae**
8. Pinnae segments small and thick, often with hairs, scales or wax.....**Pteridaceae**
8. Pinnae segments thin, not as above.....9
9. Fronds pinnate but not pinnatifid, base of pinnae fused to the axis (stipe) of the frond**Polypodiaceae**
9. Fronds distinctly pinnatifid..... 10
10. Sori linear elliptic, indusium crescent shaped.....**Dryopteridaceae**
10. Sori round or elongate, indusia not crescent shaped.....11
11. Plants large and stout**Dryopteridaceae** (*Dryopteris*)
11. Plants small and delicate..... 12
12. Sori elongate.....**Aspleniaceae**
12. Sori round.....**Dryopteridaceae**

Aspleniaceae: Spleenwort Family

The spleenwort family includes just one very large genus: *Asplenium*, with numerous species worldwide, but few in our region. The blade shapes in this genus are very diverse, sometimes very unlike the common conception of "fernlike", especially in the simple undivided blade of *Asplenium septentrionale*. However, the sori are characteristically linear in shape.

***Asplenium* "spleenwort"**

Asplenium septentrionale (L.) Hoffmann

Plants small and inconspicuous, usually 10 cm or less, blades appearing as a simple undivided blade with enlarged and sometimes forked tips.

Habitat: rock crevices, often on the north-facing side of boulders.

Notes: This species strongly resembles a short clump of grass growing on rock ledges, and the common name is often "grass fern". The enlarged or forked tip is the key that it is something different. We have relatively few collections from the Pikes Peak region, ranging from the lower foothills and canyons from Rock Creek to Cheyenne Mountain, and at higher elevations in Teller County near Divide. Due to its small size and unremarkable appearance, this species is very easily overlooked!

Asplenium trichomanes L.

Plants less than 20 cm high, delicate, with thin, divided blades composed of oblong pinnae oblong; ori appearing as stripes on the undersides of pinnae, petioles dark reddish to blackish brown.

Habitat: rock crevices in the cool, moist canyons of the foothills.

Notes: The blades of this beautiful delicate fern resemble those of the maidenhair fern often grown as a houseplant. This species is quite rare in our area, although it is widely distributed in North America. Some botanists split the species into *A. trichomanes*, with a fully dark (red brown to black) leaf rachis, and *A. trichomanes-ramosum*, where the rachis dark below and green above.

Dennstaedtiaceae: Cuplet or Bracken Fern Family

This family has also been called the Hippolepidaceae and is something of a confusing group. The characteristics typically include sori with two indusia, with the outer one formed by an inrolled margin of the segments; the fronds also usually have hairs rather than scales. Our one representative, *Pteridium*, is a very characteristic species and easily recognized by its size and broadly double-pinnate fronds. Although an invasive species in some areas of the country since it is poisonous to livestock, bracken is relatively uncommon and not problematic in our region.

***Pteridium* "bracken"**

Pteridium aquilinum (L.) Kuhn

Fronds large and broad, up to 0.75 m tall and over 100 cm wide. Pinnae triangular, margins deeply incised, fronds typically covered with hairs.

Habitat: Moist areas in woods, often under cliffs and around hillside seeps in the foothills and montane.

Notes: Uncommon in our area, except in the moist foothills on the Palmer Divide. It is our largest fern.

Dryopteridaceae: Wood Fern Family

This large family has been treated in various ways by different botanists: the version provided here is inclusive of several smaller families recognized by other botanists. An earlier name for the family was the Aspidiaceae. One group includes the ladyferns that are marked by their crescent shaped indusia. The genus *Cystopteris* is extremely common throughout Colorado, but easily confused with *Woodsia*, a genus sometimes put into its own family, the Woodsiaceae, but included here in a broad concept of the Dryopteridaceae. *Cystopteris* can be distinguished from *Woodsia* by the flat rather than inrolled edges of the pinnae, by the distinct veins that reach to the edge of the leaf margin, and by the shape of the sori. *Dryopteris*, the wood or shield fern, has round or kidney-shaped sori, and *Gymnocarpium*, the oak fern, lacks an indusium. In general, this inclusive group can be recognized by the absence of needlelike hairs and

their often scaly stems and petiole bases. Similar chromosome numbers and spore-types also link these otherwise very different genera.

- 1. Fronds large, over 10 cm wide and 25 cm tall.....*Athyrium*
- 1. Fronds smaller2
- 2. Pinnae segments oblong, not deeply toothed on the margins.....*Gymnocarpium*
- 2. Pinnae segments tapered, deeply toothed on the margins.....3
- 3. Petiole bases persistent, indusia multilobed, veins indistinct and not reaching leaf margin.....*Woodsia*
- 3. Petiole bases not persistent, indusia ovate to lanceolate, veins distinct, reaching leaf margin..*Cystopteris*

Athyrium “ladyfern”

Athyrium filix-femina L.

Plants tall, to 25 cm, with broad blades. Pinnae pinnatifid (twice divided into segments), with thickish margins.

Habitat: Cool moist areas in foothills canyons, often as an understory with spruce or Douglas fir.

Notes: Relatively uncommon on our area. Most of our records come from Bear Creek and Cheyenne Canyons near Colorado Springs, but probably also common in the Wet Mts.

Cystopteris “fragile fern”

Cystopteris fragilis (L.) Bernhardt

Plants variable in size from small and delicate to relatively large (up to 20 cm) when growing in protected spots. Fronds thin, never thick in texture. Leaf petioles brittle in texture and breaking off easily, lacking hairs; dark in color at the base, but not usually the deep purple seen in *C. reevesiana*. Veins forking at tips, extending to the tooth edge on the margins of the pinnae.

Habitat: Cliffs, rocks, soil under conifer overstory, extending from the foothills to the tundra.

Notes: This is an extremely common fern, quite variable in size depending on the conditions under which it is growing. Common misidentifications occur with *Woodsia* and between our two species of *Cystopteris*, which probably hybridize and make some identifications challenging. Look for the brown scaly hairs on the petioles of *C. reevesiana* and for the leaf edges of *Woodsia* where the veins don't extend to the leaf margin.

Cystopteris reevesiana Lellinger

Plants variable in size, but usually to about 10-15 cm. Fronds thin, leaf petioles somewhat brittle in texture and breaking easily, with sparse hairs; usually deep purple in color at the base. Veins extending to the tooth edge of the margin.

Habitat: Cliffs, rocks, and soil in foothills and montane forests.

Notes: This is a common fern, but easily confused with *C. fragilis*. The deep purple leaf bases can usually distinguish the two, and it appears that *C. reevesiana* does not occur at the higher elevations. The hairs at the base of the petiole can also be used to distinguish the two species, but they are often inconspicuous.

Dryopteris “male fern”

Dryopteris filix-mas (L.) Schott

Plants with blades up to 0.5 m, broad, and somewhat stiff. Petioles at the base of the leaves with scattered brown scales of two kinds: one broad and one hairlike.

Habitat: Cool moist canyons and north-facing slopes in the foothills, often around seepage areas.

Notes: This large distinctive fern is relatively uncommon in our area. Look for the two types of scale.

Gymnocarpium “oakfern”

Gymnocarpium dryopteris (L.) Newman

Syn. *Gymnocarpium disjunctum*

Plants medium sized, 10-25 cm, fronds distinctly deltate (forming a triangle) in appearance, with pinnae occurring only on the upper portion; pinnae oblong, not deeply toothed.

Habitat: Known in our area from collections in the foothills of Pikes Peak, including Cheyenne Canyon and around Cascade. Apparently restricted to moist woodlands near streams.

Notes: The triangular shape is very distinctive, and although not a conspicuous species, it would be difficult to confuse it with other ferns in our area.

***Woodsia* "woodsia"**

Woodsia is very common and occurs throughout our region on rocks, soil, and cliff faces. It has sori where the covering indusium splits into narrow lobes, looking something like a starfish when mature. While some botanists put *Woodsia* into its own family, other taxonomists place *Woodsia* in the Dryopteridaceae with the very similar *Cystopteris*, a genus with which *Woodsia* is very often confused. *Woodsia* can be distinguished by its persistent petioles, and by the barely visible veins that don't reach the leaf margins. Often the leaf margins in *Woodsia* roll under in our species, whereas they are usually flat in *Cystopteris*.

***Woodsia oregana* D.C. Eaton**

Plants usually small and fairly delicate, and rarely are over 15 cm in height, often smaller. The stem bases are dark red to most commonly dark purple. The midrib of the segments lack hairs.

Habitat: Forest floors under conifers, rock crevices, and cliff faces.

Notes: This species is easily confused with *Cystopteris fragilis*! The dark purple leaf bases are a helpful characteristic; look also at the veins and leaf margins (see above).

***Woodsia scopulina* D. C. Eaton**

Plants usually small, but occasionally reach 10-15 cm in height. As in *Woodsia oregana*, the base of the stems are dark red or purple; *W. scopulina* is easily distinguished, however, by the multicellular hairs that occur along the midribs of the leaf segments.

Habitat: Forest floors under conifers, rock crevices, and cliff faces.

Notes: This species is easily confused with *Cystopteris*; look at the veins and leaf margins.

Marsileaceae: Pepperwort Family

The pepperwort family is a family that few would immediately recognize as related to the ferns: *Marsilea* is our only representative, and looks like a four-leaf clover, but with odd almost parallel veins. The round reproductive structures are called *sporocarps* and occur at the base of the plant late in the season. They require seasonally moist environments, but can tolerate late season drying out of their plains mudholes.

***Marsilea* "pepperwort"**

***Marsilea mucronata* A. Braun**

Syn. *Marsilea vestita*

Plants low, forming mats of clonal groups. Leaf blades appearing like four-leaf clovers.

Habitat: Seasonally wet low areas such as playas on the plains, mudpuddles, and ephemeral ponds.

Notes: Our oddest fern can occur sporadically from year to year, depending on rainfall. When it does appear, it forms large colonial groups in shallow water. Uncommon.

Ophioglossaceae: Adder's Tongue Family

The adders tongue family of ferns, *Botrychium* and its close relative *Botrypus*, is tricky indeed. Only the most expert fern specialists can go looking for these species: usually we just find them by stumbling over them by accident. They are small, scattered, and inconspicuous by blending into a background of grasses, and also extremely challenging to identify to species! They are all unusual, and a special find. Since species can often be mixed in a small area, be sure to look carefully at the diversity of shapes and sizes. For all genera in this family, the spores are born on a separate stalk from the photosynthetic leaves. Good luck!

Key to the Genera

1. Fronds over 10 cm tall, triangular in outline, deep green in color.....*Botrypus*

1. Fronds considerably less than 10 cm tall, not triangular in outline, yellowish green in color

.....*Botrychium*

***Botrychium* “moonwort”**

Our species of *Botrychium* all grow at the middle to upper elevations in the foothills and on Pikes Peak. They all typically occur in montane or alpine meadows. Few characters distinguish them except for lobing of the leaf pinnae and breadth of the segments. No detailed habitat information is available for these species that have been identified from our region. To be sure, it is always best to send *Botrychium* specimens to a specialist. Weber and Wittman (Colorado Flora: East Slope; 2012) has excellent descriptions and illustrations. New species are always being identified in this group. See also *Botrychium pinnatum* and *B. spathulatum*.

Botrychium echo W. H. Wagner

Pinnae well separated with linear to oblanceolate segments.

Botrychium lanceolatum (Gmelin) Angström

Sterile frond broadly triangular, with narrowly linear segments.

Botrychium lineare W. H. Wagner

Blades somewhat fleshy, with linear segments. Known only from Pikes Peak; apparently very rare.

Botrychium lunaria (L.) Swartz

Syn. *Botrychium neolunaria*

The most common species, often occurring above treeline. Blades shaped like a crescent moon to wedge-shaped.

Botrychium simplex E. Hitchcock

Apex of sterile frond not deeply divided, somewhat concave, with lobes fused.

***Botrypus* “rattlesnake fern”**

Botrypus virginianus (L.) Holub

Plants triangular, sterile fronds deeply dissected and delicate. Fertile frond very narrow.

Habitat: Known from one location near Saint Peters Dome in the foothills west of Pikes Peak; the population has not been relocated. Elsewhere in Colorado, this species grows as an understory in woodland forest and shrub thickets.

Notes: Very rare or at least rarely collected; possibly still existing in moist canyons of Pikes Peak or the Rampart Range. Look for the triangular overall frond shape and delicate pinnae.

Polypodiaceae: Polypody Family

The polypody family is now more narrowly circumscribed than in a previous taxonomic era when this family name encompassed all of the ferns. Today it includes primarily the genus *Polypodium*, although some taxonomists separate out other narrow segregate genera. In our region, we have only the single species *Polypodium saximontanum*. The family is distinguished by its disk-shaped sori that lack indusia.

Polypodium saximontanum Windham

Plants up to 0.3 m tall, lobed with pinnate divisions about 2- 4 cm wide. Stems slender, white pruinose (with white mealy granules). Segments oblong, with only crenate to entire margins.

Habitat: Granitic boulders and rock faces in the foothills and lower montane forests.

Notes: A rare species; generally restricted to the area between S. Dakota and New Mexico.

Pteridaceae: Maidenhair Fern Family

This diverse family includes some separate and quite distinctive fern groups: our representatives are primarily in the lipferns; the maidenhair ferns are also in the family but have not been discovered in our region. The group as a whole can be distinguished by the submarginal sori that lack indusia and are covered by the inrolled edge of the leaf.

The lipferns are one of the most common fern groups in the Southwest, and are well represented in the Pikes Peak region where species occur in relatively dry canyons. The name comes from the “lip” of the

leaf margins curving over the sori beneath. The character occurs in other fern families, but when seen in combination with the characteristic hairs, wax, or scales of our species, it is diagnostic here. The only member of this group lacking scales, wax or hairs in our region is the green, glabrous, and rare genus *Pellaea*, which has very distinctive pinnate fronds where the separate segments are divided to the midrib. Although the group is divided into different genera, they all go by the common name of "lipfern".

Another distinct group represented in this family is the rock brake group, sometimes treated as a separate family called the *Cryptogrammaceae* because of its separate fertile and sterile fronds. It includes a pair of species in Colorado, only one of which grows in our region. The second species, *Cryptogramma stelleri*, is rare in Colorado, and has thus far been found only to our west.

Key to the Genera

- 1. Plants with separate fertile and sterile fronds.....*Cryptogramma*
- 1. Plants with sori born beneath leaves; fronds not separate.....2
- 2. Fronds green, glabrous, little divided.....*Pellaea*
- 2. Fronds hairy or scaly, or waxy below.....3
- 3. Fronds not waxy, but having scales or hairs.....*Cheilanthes*
- 3. Fronds waxy below.....*Argyrochosma*

***Argyrochosma* " lipfern, cloakfern"**

Argyrochosma fendleri (Kunze) Windham

Plants white waxy beneath, usually about 10-15 cm tall, but occasionally up to 0.3 m.

Habitat: Acidic rocks, typically on Pikes Peak granite boulders and cliff faces in the foothills. Tolerates relatively dry conditions, and is quite common in Fremont County.

Notes: Common in our region. Look for the very delicate appearance and white wax below

***Cheilanthes* "lipfern"**

Cheilanthes eatonii J. G. Baker in Hooker & Baker

Plants more than once pinnate, with the fronds densely hairy with tangled hairs below; usually about 10 cm in height but occasionally larger in wet areas. Lower portions scaly.

Habitat: Rocky slopes and cliff faces in the foothills.

Notes: Not rare, but the least common of our *Cheilanthes* species. Look for the dense hairs.

Cheilanthes feei T. Moore

Plants more than once pinnate, with fronds densely hairy below with distinctive reddish hairs; usually about 10 cm in height but occasionally larger. Lower portions lacking scales.

Habitat: Sandstone cliffs and ledges.

Notes: Generally on sandstone cliffs. Look for the distinctive red hairs.

Cheilanthes fendleri Hooker

Plants more than once pinnate, with fronds lacking hairs below but often scaly with non-ciliate scales; 10-20 cm tall.

Habitat: Granitic rocks and cliff faces in the foothills.

Notes: Our most common member of this group. Look for the scales, which lack cilia (hairlike extensions).

***Cryptogramma* "parsley fern"**

Cryptogramma acrostichoides R. Brown in Franklin

Plants short, with densely tufted evergreen leafy fronds and separate fertile stalk to 25 cm. Blade deltate to lanceolate-oblong, leathery.

Habitat: Rocky crevices, foothills to montane. Known here from Pikes Peak, in the "Bottomless Pit".

Notes: Look for the separate fertile and photosynthetic stalks. Uncommon in our region, but quite common elsewhere in Colorado.

***Pellaea* “cliffbrake”**

Pellaea atropurpurea (L.) Link

Plants with scales uniformly brown to tan in color.

Habitat: Cliff faces, in rock crevices, usually on limestone. Leaf segments without a bristle tip.

Notes: this species is quite rare here, found only a few times in our region. Look for the deep purple petiole bases.

Pellaea glabella Mett. ex Kuhn.

Plants lacking scales; plants with pinnae segments whitish, appearing fringed on margins.

Habitat: Limestone cliff faces; known from scattered locations where limestone outcrops occur in Fremont and El Paso counties.

Notes: Apparently restricted to limestone, so should be looked for where cliffs occur. Look for the lack of scales and the erose (fringed) segment margins.

Pellaea truncata Goodding

Plants with bicolored scales with a dark center and lighter margins; lower pinnae often appearing as three together. Leaf segments with a bristle-tip, pinnae with 3-5 segments.

Habitat: Cliff faces.

Notes: rare, known only from Phantom Canyon and the Royal Gorge area in Fremont County.

Pellaea wrightiana has also been reported from Fremont County. It is similar to *P. truncata* in that the leaf segments also have a bristle-tip, but the pinnae are divided into 3-5 rather than 10 segments.

ANGIOSPERMS: THE FLOWERING PLANTS

Aceraceae: Maple Family

The maple family has an alternative placement in the Sapindaceae or soapberry family. However, it is so easily recognized here, we treat it in its traditional sense of a separate family. The maple tree is immortalized on the Canadian flag: its lobed leaf is instantly familiar. We have two native species in our region, with many cultivated species occurring around urban areas and in yards. These cultivated species include *Acer platanoides* (Norway maple), *Acer rubrum* (red maple) and *Acer saccharinum* (silver maple). Many of these species are native to eastern United States, but do not naturalize here. Maples are often recognizable by the two-winged boomerang-shaped fruit called a *samara*. These fruits are characteristic of the maple family, but also appear in *Fraxinus* (ash), a cultivated tree species in the Oleaceae (olive family) naturalized along roads and residential areas.

Acer "maple"

Acer glabrum Torrey

Plants shrubs or small trees, often with many stems which appear somewhat reddish. Leaves opposite, palmately lobed with 3-5 lobes (rarely divided almost to the base), margins sharply dentate.

Habitat: Moist canyons and gulches in the foothills.

Notes: Common throughout the foothills.

Acer negundo L.

Syn. *Negundo aceroides*

Plants shrubs or small trees, usually 1-3 m in height. Leaves opposite, compound with 3-5 leaflets, rarely appearing entire with deep lobes divided to the base. Leaves on a single individual can vary considerably in morphology; margins usually toothed on the upper part to entire on the lower edges.

Habitat: Streambanks in the lower foothills, plains and into the Black Forest region. Cultivated around towns and occurring along roadsides.

Notes: Common in our region. Twigs of the boxelder are not red like those of mountain maple; the two can often occur together in the moist foothills canyons.

Adoxaceae: Muskroot or Moschatel Family

This family, with only one representative here, is superficially similar to the Ranunculaceae (buttercup family) in appearance, with lobed leaves and whitish, radially symmetrical flowers but it is most closely related to the Caprifoliaceae, the honeysuckle and elderberry family. Some botanists even place the genera *Sambucus* and *Viburnum* in the Adoxaceae! They are placed here within the Caprifoliaceae until further study reveals their relationships to our other representative, the inconspicuous but not uncommon herbaceous *Adoxa*. See Caprifoliaceae for descriptions of those woody plants.

Adoxa "muskroot"

Adoxa moschatellina L.

Plants small and herbaceous, usually less than 10 cm. Leaves trifoliate, with several rounded lobes on a longer stem, all basal, with flowering stem separate and often very inconspicuous. Flowers small, 4-lobed, yellowish-green, in tight rounded heads.

Habitat: Moist areas, montane through alpine zones. Often growing under shrubs such as willows, or in rock crevices on the tundra. Plants are very easily missed, even when in bloom.

Notes: *Adoxa* is much more common than collections would indicate. Its inconspicuous appearance and habit of growing beneath a shady overstory of other plants or among boulders makes this unusual species easy to miss.

Agavaceae: Agave Family

This distinctive family with sharply pointed leaves and tall flowering stalks symbolizes the dry desert landscapes of the American Southwest, where yuccas, agaves, and their smaller relative *Nolina* (beargrass) are common components. Many species have long histories of ethnobotanical use for food and fiber; most

play important interactive ecological roles with diverse animal species in the desert community as well. Some botanists place *Leucocrinum* (sand lily) in this family, rather than its traditional placement in the broad Liliaceae.

***Yucca* “soapweed, Spanish bayonet”**

Yucca glauca Nuttall

Plants up to 1 m, a clump of vertical, rigid, sharp-pointed leaves, inflorescence a spike of large greenish-white blossoms, petals and sepals similar, 6.

Habitat: Plains, mesas, and hot, dry areas in the foothills, occurring sometimes to lower montane, although uncommon at higher elevations.

Notes: An unmistakable plant, and very painful to encounter in the field. *Yucca baccata* occurs in New Mexico and adjacent areas of southern Colorado, but has not been found in our area. It has broader leaves than *Y. glauca* and is used as a landscaping plant.

Aizoaceae: Carpetweed Family

The Aizoaceae is well known to Californians and to gardeners, especially the genus *Mesembryanthemum* (ice plant), grown in many warm climates and native to Africa. The family somewhat resembles the Portulacaceae in its succulent habit and tendency to grow in a sprawling fashion.

***Sesuvium* “sea purslane”**

Sesuvium verrucosum Rafinesque

Plants prostrate succulent herbs, leaves rounded, ovate, 5-8 mm long, appearing similar to the garden weed purslane (*Portulaca*) but with opposite leaves and flowers consisting of 3-5 united purple “tepals” (sepals and petals alike).

Habitat: Alkaline flats on the plains.

Notes: Occurring in the Arkansas Valley in the southern portion of our region. Look for the opposite leaves to distinguish this from the Portulacaceae.

Alismataceae: Water Plantain Family

This family of aquatic plants occurs across the United States, but our representatives are relatively few due to the lack of wetlands here. These species grow in shallow water and mud along pond shores. *Sagittaria* is immediately recognizable by its “arrowhead” leaf shape, with strongly cuneate bases. *Alisma* is less common, but can be readily identified by its oval leaves on long stalks that extend down through the water to root in the mud below.

Key to the Genera

- 1. Leaves entire, lacking an arrowhead shape at the base.....*Alisma*
- 1. Leaves with prominent arrowhead flanges at the base*Sagittaria*

***Alisma* “water plantain”**

Alisma triviale Pursh

Syn. *Alisma plantago-aquatica*

Plants with leaves relatively thick in texture, oval to broadly elliptical, 4-10 cm long with rounded bases and long extended

petioles. Flower clusters occurring with unequal branches, stems rooted in the mud, not floating.

Habitat: Shallow ponds and muddy shores on the plains.

Notes: Often occurs with *Sagittaria*.

***Sagittaria* “arrowhead”**

Sagittaria cuneata Sheldon

Plants with leaves thick in texture, 4-6 cm long, prominently sagittate (arrowhead-shaped) at the base and with long extended petioles; these leaves are highly variable in shape. Fruiting heads large and globose, fruits with straight vertical beaks.

Habitat: Shallow ponds and muddy shores plains through montane.

Notes: Fruit is usually necessary for identification to species. The bracts under the fruits of *S. cuneata* are typically lanceolate, while those of *S. latifolia* are broader and more obtuse. However, if plants are not in

fruiting or flowering condition, the species are difficult to distinguish.

Sagittaria latifolia Willdenow

Plants with leaves thick in texture, 4-6 cm long, prominently sagittate (arrowhead shaped) at the base and long extended petioles. Fruiting heads globose, fruits with beak extending in a line horizontal to fruit body.

Habitat: Shallow ponds and muddy shores on the plains through the montane zone.

Notes: See comments under *S. cuneata*.

Alisma gramineus has been noted for the southern portion of our range, but at most, it is rare here. Look for its long, very narrow leaves.

Alliaceae: Onion Family

The onion family, easily recognized by its smell and appearance of the familiar garlic or onion, was once treated as part of a larger comprehensive Liliaceae, Lily Family, and some treatments still place it there. While the wild onion, *Allium*, looks like a classic lily with its simple monocot flowers of tepals (where the sepals and petals look alike), genetic work has clearly established them as a separate family closely related to Amaryllis. Onions have clear bulbs at the base, and flowers in an umbel. While we have only a few wild representatives, the family as a whole includes chives, garlic, onions, shallots, and leeks.

***Allium* "wild onion, wild garlic"**

This genus is easily recognized by the smell. While the species can superficially resemble the highly poisonous death camas (*Zigadenus*, in the Liliaceae), which grows in similar habitats, the distinctive garlicky smell of the wild onion is an easy and safe recognition factor.

Allium cernuum Roth

Plants with pink flowers, umbel distinctly nodding from a bent scape.

Habitat: Dry meadows and slopes, mesas and foothills to lower montane.

Notes: Look for the distinctive nodding umbel of pink flowers that earns the common name "nodding onion".

Allium geayeri Watson

Plants with pink flowers, umbel erect, not nodding, leaves 3 or more per stem.

Habitat: Moist meadows, high plains and Black Forest to the montane through subalpine.

Notes: Look for the erect umbel and pink flowers. This species is generally distributed at higher elevations than either *A. cernuum* or *A. textile*.

Allium textile Nelson & Macbride

Plants with white, sometimes slightly pinkish, flowers, umbel erect, leaves 2 per stem.

Habitat: Dry grasslands and meadows of the plains and mesas.

Notes: Look for the white flowers. This species is abundant in the late spring and early summer.

Amaranthaceae: Amaranth Family

Although the Amaranth family is important globally as a source of an important grain crop and several horticultural members are quite striking with brightly colored floral spikes, our representatives are nondescript and often weedy. The family can be recognized by the reddish stems and the dense inflorescence of minute flowers without petals and subtended by persistent papery bracts. Stellate pubescence (with minute star shaped hairs) is common in the family. Some treatments now include the former Chenopodiaceae in the Amaranthaceae, but these families are treated here according to their traditional separation.

Key to the Genera

1. Leaves alternate, plants lacking stellate hairs or woolly tomentum.....*Amaranthus*
1. Leaves opposite; plants tomentose or stellate pubescent.....2

2. Plants stellate pubescent with star shaped hairs, prostrate.....*Tidestromia*
2. Plants woolly, erect.....*Froelichia*

***Amaranthus* “pigweed”**

Amaranthus albus L.

Syn. *Amaranthus pubescens*

Plants sprawling to somewhat bushy clumps, usually with some ascending stems forming a tumbleweed shape 1-3 dm tall; leaves ovate; flowers in leaf axils. Bracts with a long midrib, twice length of sepals.

Habitat: Disturbed areas on the plains, especially in cultivated fields.

Notes: Adventive species. Look for the extended midrib on the bracts.

Amaranthus arenicola I. M. Johnston

Plants with broadly lanceolate leaves, 1-3 cm long; inflorescence strikingly elongate in an extended spike at the top of the stem.

Habitat: Sandhills on the plains.

Notes: Uncommon or little collected in our region. Known from the sandy soils of El Paso and Pueblo Counties.

Amaranthus blitoides S. Watson

Syn. *Amaranthus graezicans*

Plants prostrate, forming mats and branching in all directions from a central taproot. Leaves small, oval, with flowers in tight clusters in the leaf axils.

Habitat: Disturbed areas at lower elevations; common in cultivated fields.

Notes: Adventive species. Look for the mat forming growth.

Amaranthus retroflexus L.

Plants tall and coarse, to 1 m, sometimes with ascending side branches. Leaves with long petioles, blades broadly lanceolate. Inflorescence a pale green, spike-like terminal cluster with persistent stiff, spiny scales.

Habitat: Disturbed areas.

Notes: Adventive species; extremely common in our region. Look for the tall growth and pale inflorescence.

Several other species of weedy amaranths may occur in our region as well, but have not yet been verified here. These include *Amaranthus pubescens*, a densely sticky-pubescent species, and *Amaranthus wrightii*, a species resembling *A. retroflexus* but showing an inflorescence tipped with red, rhombic (diamond shaped) to ovate leaves, and a narrower spike.

***Froelichia* “cottonwool”**

Froelichia floridana (Hooker) Moquin

Plants with a simple erect stem about 10 cm tall, side branches few or lacking. Inflorescence with cottony spikes.

Habitat: Plains grasslands.

Notes: Probably less common than *F. gracilis*. Look at the stem branching pattern to tell the species apart.

Froelichia gracilis (Hooker) Moquin

Plants branched from the base, inflorescence with cottony spikes.

Habitat: Plains grasslands, mesas, and lower foothills

Notes: Very common in our region throughout the lower elevations.

***Tidestromia* “honey sweet”**

Tidestromia lanuginosa (Nutt.) Standley

Syn. *Cladothrix lanuginosa*

Plants annual, stems branched, usually prostrate. Leaf blades oval to orbicular, 5-30 mm long; both stems and leaves densely stellate pubescent (use a lens).

Habitat: Dry, usually sandy, areas, Arkansas River drainage.

Notes: Uncommon in our area, recently found in Pueblo Co.

Anacardiaceae: Cashew or Sumac Family

The cashew family includes a number of wonderfully tasty fruits and nuts for human consumption: cashews, mangos, and pistachios are among them. It also includes some very nasty plants, the bane of field biologists everywhere: poison ivy and poison oak, the genus *Toxicodendron*. While we do not have poison oak in Colorado, poison ivy is quite common and should be avoided even by those who think they are immune to its toxic compounds. The family also includes one of our most important foothills shrub community components, *Rhus aromatica* (skunkbrush or 3-leaf sumac), as well as other representatives of *Rhus*.

Key to the Genera

- 1. Plants not clearly shrubby, leaflets 3 with a petiolate terminal leaflet shiny.....*Toxicodendron*
- 1. Plants shrubby, leaflets 3 or more with the terminal leaflet sessile, dull.....*Rhus*

***Rhus* “sumac”**

Rhus aromatica Aiton

Syn. *Rhus trilobata*

Plants shrubby, up to 2 m in height; leaflets coarsely crenate on the margins, fruits red, in small clusters.

Habitat: Rocky areas in the lower foothills, mesas, occasional on the plains on bedrock outcrops occur.

Notes: This shrub (“skunkbrush” or “3-leaf sumac”) forms one of the three dominant species in the transitional foothills shrub zone, and typically occurs there with *Cercocarpus montanus* (mountain mahogany), and at least in moister areas, with *Quercus gambelii* (Gambel oak). In the Colorado Springs region, our plants have glabrous leaves and stems and represent ssp. *trilobata*. To the south, especially in canyons of Las Animas County, a very pubescent form called ssp. *pilosissima* is common. This form also occurs around Cañon City. Many transitional forms occur, especially around Pueblo Reservoir and the two subspecies are not clearly distinguished except in their extreme forms.

Rhus glabra L.

Plants forming low shrubs, typically less than a meter tall; leaflets more than 3, margins sharply toothed ; fruits red, in short clusters.

Habitat: Eroding granite slopes on canyon sides and lower foothills.

Notes: This species is easily distinguished from other *Rhus* species by its low growth form and clear preference for eroding gravelly slopes on the lower canyonsides rather than the more stable outcrops and mesa tops. Although locally common, *Rhus glabra* is not abundant throughout our region and represents the northern extent of a species more common in areas to our south.

Rhus typhina L.

Plants forming tall shrubs; leaflets more than 3, serrate on the margins; fruits red, in tall pointed clusters.

Habitat: A cultivated species, occasionally naturalized in our area, especially in open areas near houses.

Notes: Although the leaf shape is similar to the native *Rhus glabra*, this species can easily be distinguished by its taller size and the diagnostic tall red pyramid-shaped clusters of fruits that give it the common name “staghorn” sumac.

***Toxicodendron* “poison ivy”**

Toxicodendron rydbergii (Small) Greene

Plants less than 1 m to over several m in moist sites. Leaves with 3 shiny leaflets; berries white. Plants often forming thickets, but sometimes single.

Habitat: Moist foothill canyons and slopes near springs or rivulets, often at the base of cliffs where extra moisture collects, moist areas on the higher plains where subsurface water occurs. Sometimes also occurring on higher elevations on the plains.

Notes: The chemical urushiol in the leaves and stems of this plant is extremely toxic and produces an unpleasant itchy rash. The compound is so potent that sensitive people can develop the rash from handling newspaper that plants have been pressed in or from the fur of dogs. While not as abundant here as in the east, poison ivy is quite common in moist foothill sites, especially in Fremont Co. and El Paso Co. The 3 shiny leaflets are diagnostic, so watch out for these and for the small white berries about 2-3 mm in diameter.

Apiaceae (Umbelliferae): Carrot or Parsley Family

The carrot or parsley family is easily recognized, but its genera and species can pose identification challenges. The family shows the characteristic umbel shape of the flowers and fruits, known to all gardeners who plant parsnips, dill, carrots, parsley, cilantro, or fennel. Often the leaves are aromatic, although typically not sweet smelling. The smell of the leaves can be diagnostic for determining some species. The family is extremely diverse and different genera occur in many habitats throughout our region. Some are very poisonous, so accurate and careful identification is critical. Generally, flowers and fruits are required for identification, along with leaf shape and sometimes root characteristics as well. Note: *Oreoxis*, *Aletes*, *Cymopterus*, and *Pseudocymopterus* are sometimes all placed into an inclusive *Oreoxis*, or an inclusive *Cymopterus*. The separation here is based on traditional in Colorado floras.

Key to the Genera

1. Plants with leaves palmately cleft in 5-9 simple toothed segments, fruit with hooked bristles.....*Sanicula*
1. Plants not as above2

2. Basal leaves pinnately compound, with only the lower pair of leaflets incised. Plants of lower elevation wetlands, flowers minute, white.....*Berula*
2. Plants not as above3

3. Low plants of grasslands or tundra4
3. Tall or coarse plants of the foothills, forests, meadows, or roadsides.....10

4. Plants occurring in subalpine or alpine zones, flowers pale yellow*Oreoxis*
4. Plants usually occurring at lower elevations, if higher, then see *Pseudocymopterus*5

5. Plants stemless, leaves all basal*Aletes*
5. Plants with stems, leaves occurring on flowering stem6

6. Leaf divisions linear, leaves stiff and broomlike*Harbouria*
6. Leaf divisions broader than linear, leaves not stiff and broomlike7

7. Leaf rachis (main axis) winged so lobes appear to run together*Musineon*
7. Leaf rachis not winged, lobes appearing separate8

8. Fruits strongly flattened, flowers white with red anthers*Lomatium*
8. Fruits not strongly flattened, ribs conspicuous, flowers yellow, white or pink9

9. Plants of dry areas in the lowlands*Cymopterus*
9. Plants of higher elevations, montane to alpine*Pseudocymopterus*

10. Flowers yellow*Pseudocymopterus*
10. Flowers white11

- 11. Fruits long and narrow, with a licorice odor when crushed*Osmorhiza*
- 11. Fruits short and broad, not smelling of licorice12

- 12. Tall coarse plants with broad leaves and segments over 1 cm wide13
- 12. Slender plants, or if tall, then leaf segments less than 1 cm wide15

- 13. Leaves like giant maple leaves, stems stout, several cm wide*Heracleum*
- 13. Leaves not maple-shaped14

- 14. Leaves with lanceolate segments, plants of wetlands in the lowlands*Cicuta*
- 14. Leaves with ovate segments, plants of streamsides at higher elevations.....*Angelica*

- 15. Umbels with conspicuous ring of leaflike bracts, fruits with bristles.....*Daucus carota*
- 15. Plants not as above.....16

- 16. Plants of streams, moist meadows, or irrigation ditches, lower elevations to montane17
- 16. Plants of forests or montane zone.....18

- 17. Plants tall, usually around 2 m, with hollow stems spotted with purple*Conium*
- 17. Plants less than 1 m tall, fruits smelling of caraway, stem not spotted*Carum*

- 18. Plants less than 1 m tall, unbranched.....*Conioselinum*
- 18. Plants over 1 m, branched, with numerous large leaves.....*Ligusticum*

***Aletes* “Indian parsley”**

Aletes anisatus (A.Gray) Theobald & Tseng

Syn. *Cymopterus anisatus*

Plants in loose clumps, with the mature flowering stem longer than the leaves; stems to about 15 cm or less; leaves somewhat shorter. Leaves with distinctly sharp-pointed divisions. Flowers yellow.

Habitat: Common on loose gravelly slopes in the foothills, especially on Pikes Peak.

Notes: Plants with a strong anise odor when the leaves are crushed. A similar species, *A. acaulis*, occurs on gravels generally north of Denver, but is not known from our region. It has no anise odor.

***Angelica* “angelica”**

Angelica ampla A. Nelson

Plants large, often over 2 m, with large umbels and very broad leaves around 10 cm wide.

Stems thick, over 2 cm wide. Flower clusters are globose, not flat topped as in *Heracleum*.

Habitat: Common in moist meadows and along streambanks in the montane and subalpine zones.

Notes: The most common lookalike to *Angelica* is *Heracleum*, which grows in similar habitats and is another large coarse plant. The two can be distinguished by the palmately compound, somewhat maple-shaped, leaves in *Heracleum* and by the pinnately-compound leaves in *Angelica*.

Angelica grayi (Coulter & Rose) Coulter & Rose

Plants relatively low, usually less than 1 m, with large umbels; involucre bracts very long, often exceeding the umbels.

Habitat: Rocky alpine and upper subalpine slopes, Pikes Peak.

Notes: A high elevation representative of the genus, much smaller than *A. ampla*. Look for the long bracts and short stature.

***Berula* “water parsnip”**

Berula erecta (Hudson) Coville

Plants usually less than 20 cm, somewhat weak-stemmed. Leaves narrowly elliptic and deeply toothed, with the lowest pair showing a large lobe. There is no characteristic smell to the plants. Flowers white.

Habitat: Common in plains wetlands.

Notes: This is a common but inconspicuous component of wetlands and pond margins at lower elevations.

***Carum* “caraway”**

Carum carvi L.

Plants up to 30 cm, somewhat sprawling. Flowers white.

Habitat: Adventive species in hay meadows, now naturalized in the Black Forest and montane zones.

Notes: The plants have the characteristic smell of caraway (the seed in rye bread flavoring); they are cultivated as a commercial source of the seed. Caraway can be locally abundant in hay fields in our area, but it is relatively uncommon in undisturbed meadows.

***Cicuta* “water /poison hemlock”**

Cicuta douglasii (de Candolle) Coulter & Rose

Syn. *Cicuta maculata*

Plants usually less than 1 m, sometimes larger. Leaves compound, resembling marijuana in shape. Plants with a parsley-like odor; roots with horizontal chambers when cut in half. Flowers white.

Habitat: Wet areas, especially along slow streams and irrigation ditches in the lowlands.

Notes: This is an extremely poisonous plant, and can resemble other nonpoisonous species, so identification should be done with care. The narrowly compound leaves and chambered roots are diagnostic.

***Conioselinum* “hemlock parsley”**

Conioselinum scopulorum (A. Gray) Coulter & Rose

Plants relatively low, with few stem leaves, and few or no branches to the stems. Flowers white.

Habitat: Common in the foothills and montane zone, streams, moist meadows and roadsides.

Notes: This species resembles *Ligusticum* but is smaller and has a less branched stem.

***Conium* “poison hemlock”**

Conium maculatum L.

Plants tall and rank, often over 2 m with the flowering stem. Stems with purple blotches. Leaves initially forming a basal rosette of pinnately divided leaves that are green and visible in winter.

Habitat: Common in the low elevations along streams, seeps, and in moist meadows.

Notes: This adventive species has become abundant throughout our region. It is one of the two species that go by the common name poison hemlock, and like its namesake *Cicuta*, it is very toxic if eaten.

***Cymopterus* “spring parsley”**

See also *Oreoxis* and *Pseudocymopterus*.

Cymopterus acaulis (Pursh) Rafinesque

Plants initially low, appearing stemless, but stems elongating in age and plants can become much taller, to ca. 20 cm. Leaves bright green and glossy; flowers white. Bracts below the umbel lack papery margins.

Habitat: Common in plains grasslands and on the mesas.

Notes: One of our early spring wildflowers. Look for the glossy green leaves.

Cymopterus montanus Torrey & Gray

Plants initially low, but elongating somewhat in age and becoming taller. Leaves somewhat fleshy and glaucous (bluish green) in appearance, flowers pinkish. Bracts below the umbel with papery margins.

Habitat: Common in the plains grasslands and on the mesas.

Notes: One of our early spring wildflowers. The two species of *Cymopterus* can be distinguished by the appearance and coloration of the leaves, although they share similar habitats. See also the bracts.

***Daucus* “Queen Anne’s lace”**

Daucus carota L.

Plants biennial, up to 80 cm, with a strong carrot smell. Flowers white, with a pink or purple coloration in the center. Umbels multiple, forming a birdcage-like structure when mature.

Habitat: Uncommon adventive species in our regions, sometimes occurring in fields or around parking lots in disturbed ground.

Notes: This species can be a problematic weed in the east, but seems not to have become naturalized here.

***Harbouria* “whiskbroom parsley”**

Harbouria trachypleura (A. Gray) Coulter & Rose

Plants with mostly basal leaves, with stiff broom-like linear segments. Flowers yellow, in globose umbels.

Habitat: Open gravelly slopes on the mesas through the lower foothills to the montane.

Notes: The stiff narrow leaves of this species are diagnostic.

***Heracleum* “cow parsnip”**

Heracleum sphondylium L.

Plants with broad leaves, palmately compound and appearing maple-shaped in outline. Stems very tall and stout, up to 2 m, topped with flat-topped umbels of white flowers.

Habitat: Common along streamsides and moist areas in the foothills and montane.

Notes: Sometimes confused with *Angelica ampla*, another very large and stout species occurring in the montane. *Heracleum* but easily distinguished by the flat-topped umbels and different leaf shapes. See *Angelica*.

***Ligusticum* “lovage, osha”**

Ligusticum porteri Coulter & Rose

Plants to 1 m, stout and robust in appearance, much branched. Leaves ovate in outline. Flowers white.

Habitat: Moist areas along streams and in wet meadows, lower foothills through the montane and subalpine.

Notes: This plant is sometimes referred to as “osha”, and used medicinally for a great variety of ailments. Overcollecting in some areas of Colorado has led to local extinctions. Because of this and because of the risk of confusing *Ligusticum* with other species of similar appearance that are poisonous, would-be herbalists should be discouraged from wild collecting this plant.

***Lomatium* “biscuitroot, salt and pepper plant”**

Lomatium orientale Coulter & Rose

Plants low at first, less than 10 cm, but stems elongating in age and mature stems can be 20 cm.

Flowers white, with contrasting dark red anthers, the source of the common name.

Habitat: Very common on the plains and mesa grasslands.

Notes: This is one of our earliest blooming spring wildflowers and is very inconspicuous at first when the flowers are hidden within the leaves. Later in the spring, the stems are more elongate and noticeable in fruit. The light and dark appearance of the flowers is very characteristic.

***Musineon* “wild parsley”**

Musineon divaricatum (Pursh) Nuttall

Plants low, appearing stemless even when in fruit, with leaves spreading out over the ground. Flowers yellow.

Habitat: Common on the plains in grasslands.

Notes: This species has a very characteristic growth habit, unlike some of the other early-blooming umbels, it remains low and close to the ground even when in fruit.

***Oreoxis* “alpine parsley”**

See also *Cymopterus*

Oreoxis humilis Rafinesque

Syn. *Cymopterus humilis*

Plants low and inconspicuous, but growing in large patches; flowers yellow. Leaves and entire plant glabrous (hairless).

Habitat: Gravelly areas on the tundra of Pikes Peak.

Notes: This species is very similar to the much more widespread *Oreoxis alpina* that occurs throughout the mountains of Colorado, but differs in being entirely glabrous (lacking hairs). *Oreoxis humilis* is apparently restricted to Pikes Peak (where it is common); *O. alpina* has never been collected there. The genetic relationship between the two species has yet to be fully resolved.

***Osmorhiza* “sweet cicely”**

Osmorhiza depauperata Philippi

Plants up to 1 m, leaf segments twice ternately compound (divided in 3's), leaflets ovate to almost orbicular. Umbels lacking bracts at the base. Roots strongly scented with licorice; fruits club-shaped, broad at the apex.

Habitat: Locally common in the moist canyons of the foothills but apparently limited in extent here.

Notes: This is our most common species of *Osmorhiza* in the Pikes Peak region. Two other species have been reported: *Osmorhiza longistylis*, which is distinguished by its well-developed bracts at the base of the umbels, and *O. chilensis* (*O. berteroi*) which has narrowly cylindrical rather than club-shaped fruits seen in *O. depauperata*. All three species are part of the relictual eastern forest element and appear at the fringe of their range here. It is very difficult to distinguish them without careful examination of the umbels and the ripe fruit, so it is likely that all three exist in our region, especially in the moist canyons of the Palmer Divide and on the west side of Pueblo County in the moist canyons coming off the Wet Mountains. Bracts and fruits should be examined closely for identification.

***Pseudocymopterus* "mountain parsley"**

Pseudocymopterus montanus (A. Gray) Coulter & Rose

Syn. *Cymopterus lemmonii*

Plants variable in size (usually ca. 20 cm) and leaf morphology, stems slender and erect, leaflets narrow, pinnate. Umbels compound, flowers yellow.

Habitat: Common in dry soil of ponderosa pine forests, especially in the Black Forest and throughout the montane zone as a conifer understory species and in dry montane meadows.

Notes: This species is quite variable in appearance, but is one of the few upper elevation umbelliferous species that prefers drier habitats, especially under pines and occasionally around oaks. The bright yellow flowers often stand out in early summer in the pine duff where relatively few colorful species exist.

***Sanicula* "snakeroot"**

Sanicula marilandica L.

Plants with leaves palmately divided in 3-7 segments, with oval to obovate leaflets and characteristic toothed margins. Umbels of greenish-white flowers capitate (in head like clusters), on very short stalks, containing a leaflike involucre beneath. Fruits with distinctive hooked bristles.

Habitat: Locally abundant in moist canyons of the foothills and in the Black Forest, but limited to these habitats. *Sanicula* often occurs with *Osmorrhiza*.

Notes: This is a distinctive species of the moist forest habitats. Although it is often abundant locally, the moist areas where these populations occur are infrequent in our dry region and these communities should be considered worthy of note.

Apocynaceae: Dogbane Family including Asclepiadaceae: Milkweed Family

The dogbanes strongly resemble the milkweeds (traditionally the Asclepiadaceae) in having opposite leaves, milky juice, and pod-like fruits and are now included in some familial treatments together. However, they lack the complex flower structure of the milkweeds (here having bell-shaped flowers in which the parts are easily interpreted) and are treated traditionally as a separate family.

I. Key to the Genera (traditional Apocynaceae, with bell shaped flowers)

- 1. Flowers bell-shaped, white to pink, in terminal clusters.....*Apocynum*
- 1. Flowers open, purple, in the leaf axils*Vinca*

***Apocynum* "dogbane"**

Apocynum androsaemifolium L.

Plants erect, to ca. 0.5 m, somewhat branched in pairs. Leaves shortly petiolate, 2-10 cm, lanceolate to ovate, appearing to droop. Flowers pink to white, up to 3 times the length of the calyx.

Habitat: Common in the lower foothills and on the mesas.

Notes: The species of dogbane are prone to hybridize (recognized as *A. x floribundum*) and it is often difficult to distinguish them when not in flower. Look for the drooping appearance of the leaves in this species.

Apocynum cannabinum L.

Syn. *Apocynum sibiricum*

Plants erect, to ca. 0.5 m, branching in pairs. Leaves usually somewhat petiolate, 2-10 cm long, ovate to lanceolate, erect to somewhat spreading but not drooping. Flowers greenish white, less than 3 times the length of the calyx.

Habitat: Common along roadsides and in moist ditches on the plains. Apparently occurring at lower elevations than *A. androsaemifolium*.

Notes: Due to hybridization, the species of *Apocynum* can be difficult to distinguish. A large leafed form with cordate (heart-shaped) bases has been described from the Great Plains as *A. sibiricum*, and some of our individuals can approach this form in appearance, which is very different than the true *cannabinum*. Due to many intermediate forms, most botanists now treat the complex as a single highly variable species under the name *A. cannabinum*. Look for the spreading leaves in this species.

***Vinca* “periwinkle”**

Vinca minor L.

Plants low, mat-forming, evergreen with opposite, oblong or elliptic leaves and blue-purple flowers that are solitary in the leaf-axils.

Habitat: Uncommon naturalized garden plant around towns and old cabins in the foothills.

Notes: This is a well-known garden species used as a ground cover persisting around old home sites in the foothills and sometimes spreading.

II. Asclepiadaceae: Milkweed Family (reflexed flower parts with hoodlike internal structures)

This morphologically distinctive group with opposite (occasionally appearing alternate!) leaves and milky juice has both common and rare members, with representatives spanning numerous local ecosystems. The floral structure is extremely complex, with close relationships to specific pollinators as well as to butterflies and their larvae who use milkweed leaves as host plants and nectar resources from the flowers. *Asclepias* is our most abundant representative; *Sarcostemma* is much harder to find, or perhaps is so hard to see, it goes unnoticed.

Key to the Genera (traditional Asclepiadaceae)

- 1. Plants not a vine, stems erect to spreading.....*Asclepias*
- 1. Plants a vine, stems twining.....*Sarcostemma*

***Asclepias* “milkweed”**

Asclepias arenaria Torrey

Plants stout and conspicuous, up to 1 meter but often sprawling. Large, ovate, and leathery leaves somewhat crowded on the stems. Surfaces canescent-tomentose (with dense short hairs), and at least some leaves are distinctly petiolate (with stalks at the base).

Habitat: Deep open sand on the plains.

Notes: This species resembles *A. latifolia*, but can be distinguished by the hairy petiolate leaves and its occurrence in deep sandy soils, as well as its sprawling growth habit.

Asclepias asperula (Decaisne) Woodson

Plants generally low and sprawling, with stout stems and large lanceolate leaves up to 10 cm long.

Flowers in a large globose umbel, with distinctive green and purple flowers.

Habitat: Gravelly or sandy slopes, especially in and around shrub thickets on the mesas and foothills, occasionally on the ridges and outcrops of bluffs on the plains under piñon pine or juniper.

Notes: This is one of the most striking and distinctive of our milkweed species with its characteristic green and purple flowers. Although not rare, plants typically don't occur in large numbers in any location. Its unusual common name is “antelope horns”.

Asclepias engelmanniana Woodson

Plants tall, to 1 m, with moderately stout glabrous stems, and flower clusters in the axils of the stem leaves. Leaves droopy, long and linear, less than 3 mm wide, and margins somewhat revolute (bent under). Flowers greenish white to slightly purplish, with the lobes reflexed.

Habitat: Dry, sandy or rocky areas on the plains.

Notes: This species is most similar to *A. stenophylla*, which grows in similar habitats. *Asclepias*

englemanniana can be distinguished by its glabrous (hairless) rather than pubescent stems and by the structure of the floral hood, which is not 3-lobed as in *A. stenophylla*.

Asclepias hallii A. Gray

Plants tall, up to and sometimes over 1 m, with stout stems and ovate-lanceolate leaves that tend to be acute at the apex. Flowers in terminal clusters, corollas small, greenish white tinged with purple.

Habitat: High plains to upper foothills and montane, in moist gravelly soils, often on stream benches or banks. Uncommon to rare.

Notes: Somewhat resembling *A. speciosa*, but generally occurring at higher elevations and with very different flowers than that species.

Asclepias incarnata L.

Plants usually to a meter tall, stems sometimes branched and only moderately stout, with oblong-lanceolate leaves. Flowers in terminal clusters, pink to rosy purple.

Habitat: Wet areas and seeps on the plains; rare to uncommon in our region though much more common in regions to the north.

Notes: This distinctive wetland milkweed may have been more common in the past before wetland draining occurred here. It currently is recorded from the plains wetlands of Pueblo and southern El Paso County, and probably occurs in remaining wetlands around Falcon and Peyton.

Asclepias latifolia (Torrey) Rafinesque

Plants tall, stout and conspicuous, up to 1 m, with large, ovate, leathery leaves somewhat crowded on the stems. The leaves are glabrous (lacking hairs) and somewhat shiny, without obvious hairs, and lack petioles.

Habitat: Rocky, gravelly, and sometimes sandy areas on the plains, especially common along roadsides.

Notes: This species resembles *A. arenaria*, but can be distinguished by the glabrous stalkless (sessile) leaves and the erect growth. It is extremely common in Pueblo and eastern Fremont Counties.

Asclepias pumila (A. Gray) Vail

Plants small, usually less than 20 cm, and delicate looking with tufted stems and whorled, linear, filiform leaves. Flowers small, greenish white, terminal or in the upper leaf axils.

Habitat: Mesas, lower foothills, and plains, typically in grassland communities.

Notes: This species is common, but somewhat inconspicuous, especially when not in flower. The short, tufted stems and small flower clusters are diagnostic.

Asclepias speciosa Torrey

Plants tall, up to 2 m in, with thick stems and oblong-ovate, shortly petiolate leaves up to 25 cm long. Leaf veins are very prominent. Flower clusters very showy, with large pink or whitish clusters at the top of stems or in upper leaf axils. Often occurring in clumps or groups.

Habitat: Moist sites, along roadsides, ditches, and in meadows on the plains up to the montane. Extremely common throughout our region.

Notes: This is a very noticeable and common species. Although native, it acts in a somewhat weedy fashion, invading disturbed areas along roadsides and ditches in large populations.

Asclepias subverticillata (A. Gray) Vail

Plants tall and slender, up to 1 m in height, with whorled linear leaves and long internodes. Flower clusters occurring in the upper leaf axils, flowers small, whitish to somewhat greenish.

Habitat: Roadsides, dry areas on the plains.

Notes: This species is common and somewhat weedy, occurring abundantly along roadsides. The leaf whorls often contain smaller leaves within the longer ones.

Asclepias tuberosa L. ssp. *terminalis* Woodson

Plants low and sprawling, leaves lanceolate, opposite to alternate, somewhat hairy. Flowers bright orange, in terminal clusters.

Habitat: Gravelly slopes of the foothills.

Notes: This is one of our most beautiful midsummer wildflowers of the foothills and is quite noticeable

with its orange flowers that attract many butterflies. Because this species has a restricted habitat, is rarely abundant in its scattered populations, and often picked by hikers, it should be regarded as special for our region and protected when possible. *Asclepias tuberosa* often lacks the milky juice typical of the genus.

Asclepias uncialis Greene

Plants inconspicuous, delicate, less than 10 cm, leaves linear, sometimes wider at base, with margins containing incurved hairs. Flowers small, purplish.

Habitat: Sandy or gravelly soils, in open areas of grasslands, sometimes among pine or juniper clumps. Apparently extremely rare.

Notes: This species occurs across Colorado and into neighboring western states, but is nowhere abundant. It is very difficult to spot and often does not flower or even appear from year to year.

Asclepias viridiflora Rafinesque

Plants low and somewhat sprawling, with variable leaf widths ranging from narrowly to broadly lanceolate, and most often with undulate margins. Flowers greenish white, in leaf axils.

Habitat: Common but scattered as individuals in dry or rocky areas of the plains, mesas and lower foothills. It typically occurs around shrubs on rocky outcrops.

Notes: This species is quite variable in leaf morphology but characteristically sprawls and has distinctively curling leaf margins.

***Sarcostemma* “twinevine”**

Sarcostemma crispum Benth.

Syn. *Funastrum crispum*

Plants a vine, typically growing on other species such as oaks or tall grass clumps, but young plants occasionally show only a straight stem. Leaves hastate or sagittate (with an arrowhead base) at the base, narrowly to broadly lanceolate, with sometimes curly margins. Pods long and linear.

Habitat: Oak and piñon-juniper woodlands and rocky slopes, southern portion of our area.

Notes: This species is apparently rare in our region, at the edge of its range in the Great Plains.

Our collections come from the Phantom Canyon area, where it has been found in sandstone crevices and growing on oaks and grass clumps. Other sites are known from rocky slopes just southeast of our region.

Warning: a locally common weedy species, *Convolvulus equitans* in the Morning Glory Family, also has a vining habit and sagittate leaves but lacks the opposite leaves and milky juice of *Sarcostemma*.

Araceae: Arum Family (excluding Lemnaceae: Duckweed Family)

This primarily tropical family is typically aquatic. Our single representative *Pistia stratiotis*, water lettuce, is nonnative, and appears only sporadically from short-lived introductions from aquatic gardens and fish tank dumping. Persistence and spread is unlikely but possible. *Pistia* has broad leaves with prominent ribs occurring in a basal cluster. It is a floating plant, not anchored in mud. The Lemnaceae (*Lemna*, duckweed) is sometimes also included in this family, but treated separately here.

Araliaceae: Ginseng Family

The *Aralia* or ginseng family resembles the Apiaceae with its umbellate inflorescence, but the fruit is a round black berry. It is a representative of the eastern geographic element, somewhat unusual in our region, and mostly restricted to cool moist foothill canyons and the Black Forest.

***Aralia* “wild sarsaparilla”**

Aralia nudicaulis L.

Plants with a long petiolate (stalked) basal leaf carrying 3 leaflets and a separate flowering stem of a few globose umbels. Fruits a small black berry.

Habitat: Uncommon in wet foothill canyons; most common in the Palmer Divide west of Palmer Lake.

Notes: Like other representatives of the eastern forest element, this species is not abundant here, although it can be locally abundant.

Asparagaceae: Asparagus Family

Although we would all recognize the early spring “spears” of asparagus, it is often difficult to find them in the wild. The later form, with delicate filmy leaves off a branching stem and red fruits, is much more obvious but plants are no longer edible at that point.

Asparagus officinalis L.

Plants up to 2 m, with thin branches and narrow delicate leaves. Flowers greenish yellow, becoming red globose fruits later.

Habitat: Common in moist areas along trails and ditches on the plains and lower foothills. Adventive but naturalized throughout our region.

Notes: Easily identifiable, but caution should be exercised about eating this species, delicious though it is, because it can often grow in highly polluted water or soils. It is easier to spot in the later tall, branching stage (not edible), than when it is growing as young tender shoots.

Asteraceae (Compositae): Aster Family

The Aster family (sometimes called Daisy or Sunflower family) is large and complex, especially in the Southwest. Its representatives occur in all habitats: wetlands and arid lands, plains to the highest tundra and talus slopes of the mountains. Although many of the representatives are superficially similar, at least at the generic level the taxa are fairly straightforward to identify, although they have specialized parts and terminology. As with all complex plant families, name changes are frequent at the generic level, and not all botanists agree on which generic name to use. This key uses the most traditional genera, but alternatives are given. The Asteraceae have a particularly complex inflorescence, and knowing its specialized terminology is critical for identification in this family. Here is a short guide to terms; getting used to them is just a matter of practice!

Head: the type of inflorescence where specialized flowers (*ray* and *disk* flowers) work together as a reproductive unit. Some heads in the Asteraceae have both ray and disk flowers, some are all ray flowers, and some are all disk flowers.

Ray flowers: the flat petal-like flowers (what gets pulled off in the game “s/he loves me-s/he loves me not”) that serve usually only as attractants for pollinators and are not fertile, although they typically contain a residual ovary and stigma.

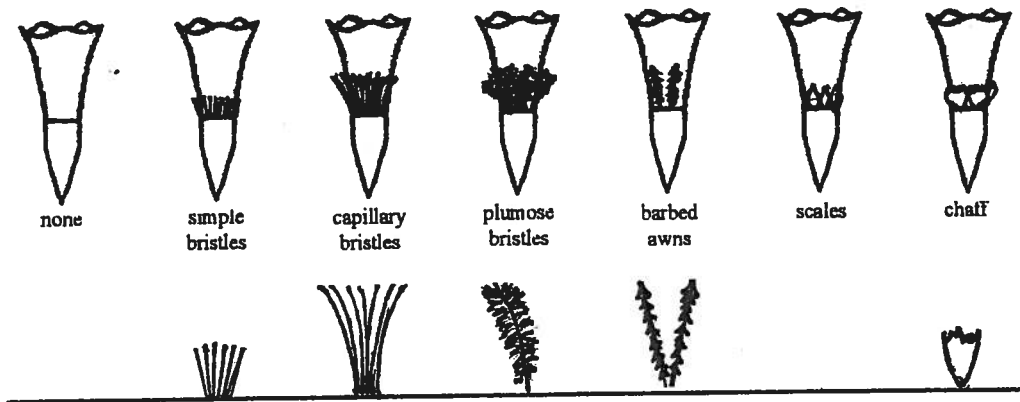
Disk flowers: the inner set of flowers. Usually a different color than the ray flowers; typically fertile, with a single inferior ovary and corolla of tiny fused petals.

Pappus: technically the modified calyx of the disk flowers that sits on the upper edge of the ovary. It can appear as hairs or bristles, scales, or short awns (short pointed stiff projections), or even be lacking in some species. Illustrations of these are given below. The pappus will be located on the top of the ovary, which is inferior, just below the fused base of the floral tube. The pappus is very important in keying, especially in getting to different portions of the key, so look carefully and practice recognizing the different types. A lens or microscope is extremely useful in seeing the pappus type. See the illustrations below of different types of a pappus.

Achene: the mature ovary turns into an achene (think of a sunflower seed). This is a dry, non-splitting, single-seeded fruit, where the seed is attached to the ovary wall.

Receptacle: the top of the stem where the disk flowers are embedded. Usually a dome-shaped structure, and sometimes containing small flat scales called “chaff”. In small hards, the chaff on the receptacle is hard to see sometimes, as it is located tightly between the ovaries stuck into the receptacle. Don’t confuse a chaffy receptacle, with a chaffy pappus! The term describes the appearance, but the different chaff types are located in different places.

Phyllaries: Small bracts beneath the inflorescence that look like and are positioned as sepals would be in a simple flower (see *pappus*, the true modified sepals). Color, shape, arrangement, and ornamentation of the phyllaries can be diagnostic at the generic and species levels. The *involucre* (a whorl of bracts below an inflorescence) refers to the phyllaries collectively.



Simple bristles are straight hairs, capillary bristles are thin, somewhat arching hairs, and plumose bristles are feathery. Barbed awns sharp points with downward projections as on a fish hook. Scales are thin and dry structures, and chaff is a broader, membranous structure. Don't confuse a chaffy pappus with chaff on the receptacle, as occurs in a sunflower.

Given the large size of the family, keys to identification are typically broken up into separate groups. The groups identified here are the usual segregates in the Asteraceae. Be aware that occasional mutants and/or rayless species occur in several genera where ray flowers usually occur. These are most common in Groups C and D, where the disks are very prominent. The milky sap is apparent only in living plants.

- 2. Flowers composed entirely of strap-shaped ray flowers, stems and leaves with milky sap...**Group A**
(Dandelion-like group)
- 2. Flowers not as above, plants lacking milky juice 2
- 3. Both ray and disk flowers present 3
- 3. Only disk flowers present5
- 4. Ray flowers yellow or orange4
- 3. Ray flowers white, pink, purple or blue **Group B** *(Daisy and Aster-like group)*
- 4. Pappus chaffy (broad scales), or of firm awns or absent **Group C** *(Sunflower-like group)*
- 5. Pappus of capillary or plumose (feathery) bristles **Group D** *Senecio and Goldenrod-like group)*
- 6. Inflorescences spiny and bur-like OR phyllaries with either spines or broad papery margins
..... **Group E** *(Thistle-like group)*
- 5. Inflorescence not as above 6.
- 6. Pappus of capillary or plumose bristles **Group F** *(Rabbitbrush-like group)*
- 6. Pappus absent or composed of scales, short awns, or teeth **Group G** *(Sagebrush-like group)*

GROUP A: DANDELION-LIKE GROUP: PLANTS WITH RAY FLOWERS ONLY, SAP MILKY.

- 1. Flowers blue, pink, purple or white2
- 1. Flowers yellow or orange.....9
- 2. Flowers sky blue, pappus a crown of blunt scales.....*Cichorium*
- 2. Flowers not sky blues, pappus composed of bristles, not scales.....3
- 4. Pappus plumose (feathery).....4
- 3. Pappus simple bristles, not feathery.....5
- 4. Leaves elongate and somewhat grasslike, stems tall and with few branches, heads large with swollen stem (peduncle) below.....*Tragopogon*
- 4. Leaves short and inconspicuous, stems wiry and branched, heads small, peduncles not swollen.....*Stephanomeria*
- 5. Stems low and branched; leaves narrowly linear or very short and bractlike.....6
- 5. Stems tall and unbranched, leaves well developed.....7
- 6. Plants annual, pappus white.....*Shinnersoseris*
- 6. Plants perennial, pappus brownish*Lygodesmia*
- 7. Leaves lanceolate, tips of lobes tapered to a point.....*Lactuca*
- 7. Leaves oblanceolate, tips rounded.....8
- 8. Leaves lacking hairs (glabrous) and glaucous (with a bluish white surface coloration), heads nodding.....*Prenanthes*

8. Leaves with hairs, not glaucous, heads erect	<i>Hieracium albiflorum</i>
9. Leaves mostly basal, stem leaves reduced in size upwards on the stem.....	10
9. Leaves not mostly basal, stem leaves not reduced in size on the stem.....	18
10. Pappus of plumose (feathery) bristles, heads nodding; plants of montane and subalpine zones	<i>Microseris</i>
10. Pappus of simple bristles, plants not as above and in all elevations	11
4. Plants with a basal rosette of almost entire to denticulate (finely toothed) leaves, heads less than 4, with a broad noticeable bract at the base.....	<i>Krigia</i>
11. Plants not as above.....	12
5. Heads single, stem leafless.....	13
12. Heads more than one, stem with at least 1 leaf (usually more)	15
13. Leaves with wavy margins carrying crinkly hairs.....	<i>Nothocalais</i>
6. Leaves not as above.....	14
7. Achenes with 10 ribs (appearing as lines), flowers orange or yellow; if yellow, then large with erect phyllaries.....	<i>Agoseris</i>
14. Achenes with 4-5 ribs; plants with large yellow flowers and down-curved phyllaries OR plants small and inconspicuous, growing in the alpine zone.....	<i>Taraxacum</i>
<i>Note: Agoseris, Taraxacum, and Nothocalais look a lot alike; check all three genera!</i>	
8. Ray flowers orange, stems with gland-tipped hairs and stiff, spreading hairs.....	<i>Hieracium</i>
15. Ray flowers yellow; pubescence (hairs) otherwise or lacking.....	16
16. Pappus white.....	17
9. Pappus brown or reddish.....	<i>Hieracium</i>
10. Dwarf alpine plants of scree slopes; leaves simple and entire, succulent.....	<i>Crepis nana</i>
17. Plants of wet meadows on the plains through the upper montane; stems not short and dwarf.....	<i>Crepis</i>
11. Leaves simple, not toothed or divided.....	<i>Tragopogon</i>
18. Leaves toothed or divided.....	19
12. Leaves ovate, margins dentate; pappus lacking.....	<i>Lapsana</i>
19. Leaves not as above; pappus present.....	20
13. Pappus plumose, leaves lobed, margins not sharply toothed.....	<i>Scorzonera</i>
20. Plants not as above; leaf margins sharply toothed.....	21
14. Fruits beaked, involucre below the heads cylindrical.....	<i>Lactuca</i>
20. Fruits not beaked; involucre below heads broad.....	<i>Sonchus</i>

**GROUP B: ASTER OR DAISY-LIKE GROUP: PLANTS WITH BOTH RAY AND DISK FLOWERS; RAY FLOWERS
WHITE, PINK, PURPLE, OR BLUE**

1. Plants growing in low, tight cushions with heads recessed deeply into the linear-lanceolate leaves; plants of barrens in the Arkansas River drainage.....	<i>Parthenium</i>
1. Plants not as above.....	2
2. Lower leaves opposite.....	3
2. Lower leaves alternate.....	6

3. Ray flowers pink, purple, or blueish.....	4
3. Ray flowers white.....	5
5. Leaves pinnatisect (divided to midrib), plants of the Black Forest region and adjacent plains... <i>Cosmos</i>	
4. Leaves simple, plants of sandy areas on the plains..... <i>Palafoxia</i>	
5. Plants perennial, low, bushy and somewhat woody at the base; heads 1 cm or more in diameter <i>Melampodium</i>	
6. Plants annual, tall and slender, head <0.5 mm in diameter <i>Galinsoga</i>	
7. Receptacle chaffy with broad scales among the ovaries or achenes.....	7
6. Receptacle not chaffy.....	9
7. Ray flowers purple, chaffy scales stiff and pointed..... <i>Echinacea</i>	
8. Ray flowers white or creamy, chaffy scales not stiff and pointed.....	8
8. Leaves finely dissected and aromatic; heads with few broad ray flowers..... <i>Achillea</i>	
9. Plants not as above; leaves in basal rosettes, stems tall and leafless; ray flowers many. .. <i>Hymenopappus</i>	
10. Pappus lacking.....	10
9. Pappus present, composed of bristles.....	11
11. Leaves simple to pinnatisect, heads >1 cm in diameter, plants not distinctly aromatic and smelling of pineapple..... <i>Leucanthemum</i> (see also <i>Matricaria perforata</i>)	
10. Leaves finely pinnatisect, head<1 cm in diameter, plants aromatic, smelling like pineapple <i>Matricaria</i>	
12. Leaves very large, cordate-triangular with white hairs below..... <i>Petasites</i>	
11. Leaves not as above.....	12
13. Pappus of rigid bristles, plants low, bushy cushions, often stemless..... <i>Townsendia</i>	
12. Pappus of long capillary bristles, plant not as above.....	13
14. Phyllaries in rows, appearing layered, not leaflike nor with chartaceous (papery) bases that contrast with green tips.....	14
13. Phyllaries more or less equal and leaflike or in several layers with a chartaceous base and green tips	17
15. Ray flowers numerous, very narrow and short.....	15
14. Ray flowers few or numerous but not narrow and short.....	16
16. Ray flower "ligule" (the single petal) minute, hardly noticeable, involucre <0.5 mm <i>Conyza</i>	
15. Ray flower "ligule" conspicuous, or involucre >0.5 mm..... <i>Erigeron</i>	
16. Plants perennial, often with woody caudices (persistent stem bases) or deep rhizomes..... <i>Erigeron</i>	
17. Plants annual, biennial, or short-lived perennial..... <i>Erigeron (divergens group)</i>	
17. Plants annual, pappus conspicuous and appearing like a powderpuff when in fruit..... <i>Brachyactis</i>	
18. Plants perennial, pappus not as above.....	18
18. Leaves usually linear (except for basal leaves, which may be lanceolate).....	19
19. Leaves usually broader, not linear (but see <i>Aster, virgulus-group</i> also)	20

- 20. Leaves <1 cm long, plants low and bushy branched;*Leucelene*
- 19. Leaves >3 cm long, plants taller and little branched, rays white with pale yellow disk flowers
.....*Oligoneuron (Unamia) album*
- 21. Leaves toothed or divided.....*Machaeranthera*
- 15. Leaves entire.....21
- 21. Involucre 3-4 mm, leaves linear-oblong and short.....*Aster - "virgulus" group*
- 16. Involucre >4 mm, leaves broader and long.....*Aster*

Group C: Sunflower-like Group: Plants with both ray and disk flowers; ray flowers yellow or orange, pappus "chaffy" or of firm awns or absent.

Note: Ray flowers are sometimes lacking in *Bidens*, which will key here. See description of the genus.

- 1. Phyllaries sticky or gummy with sap.....2
- 1. Phyllaries not sticky or gummy.....4
- 2. Gummy sap on phyllaries occurring in narrow lines, leaves opposite.....*Flaveria*
- 2. Sap on phyllaries not occurring in narrow lines, leaves alternate.....3
- 3. Leaves broad, lanceolate-oblong, heads > 1 cm in diameter.....*Grindelia*
- 3. Leaves narrowly linear, heads < 0.5 cm in diameter.....*Gutierrezia*
- 4. Receptacle with scale-like chaff or bristles (use a lens).....5
- 4. Receptacle lacking chaff or bristles (use a lens).....19
- 5. Receptacle with bristles, ray flowers typically bi-colored yellow and orange-red.....*Gaillardia*
- 5. Receptacle with chaff, ray flowers not bi-colored.....6
- 7. Phyllaries broad and rounded, plants short, w/slightly twisted linear lanceolate leaves.....*Zinnia*
- 6. Plants not as above.....7
- 7. Achenes flattened at right angles to the radius of the head.....8
- 8. Achenes not flattened or if flattened, then parallel to the radius of the head.....12
- 9. Leaves scratchy to the touch.....9
- 8. Leaves not scratchy to the touch.....10
- 10. Plants less than 1 m tall, plants of dry prairie and roadside*Engelmannia*
- 9. Plants tall, up to 2 m, plants of moist prairie (historical record only, sometimes cultivated).....*Silphium*
- 10. Pappus of 2-4 barbed awns (appearing like short horns), leaves entire or pinnatifid.....*Bidens*
- 11. Pappus of 2 minute teeth or entirely lacking, leaves pinnate, basal.....11
- 11. Lobes of disk flowers equal, triangular, plants of wet areas.....*Coreopsis*
- 12. Lobes of disk flowers unequal, oblong to linear-lanceolate, plants of dry areas.....*Thelesperma*
- 13. Phyllaries in a single row, glandular, ray flowers very short, plants sticky.....*Madia*
- 12. Phyllaries not as above, ray flowers not notably short, plants not sticky.....13
- 13. Receptacle prominently elongate or conical so disk sticks up as a lump.....14
- 13. Receptacle flat or only slightly convex.....18
- 14. Receptacle elongate, ray flowers or maroon, leaves with narrow divisions.....*Ratibida*
- 14. Receptacle conical, ray flowers all yellow, leaves simple or with broad divisions.....15

15. Ray flowers with well-developed styles (use a lens), flower heads large, over 3 cm diameter, disk flowers greenish or dark brown.....	<i>Rudbeckia</i>
15. Ray flowers lacking styles, flower heads smaller, disk flowers yellowish, brown or reddish.....	16
16. Leaves mostly alternate, somewhat to strongly silvery white hairy below.....	<i>Verbesina</i>
16. Leaves opposite, green below.....	17
17. Leaves entire.....	<i>Heliomeris</i>
17. Leaves serrate (sharply toothed) on the margins.....	<i>Heliopsis</i>
18. Pappus persistent, achenes flattened, plants of the montane zone.....	<i>Helianthella</i>
18. Pappus deciduous, achenes plump, not obviously flattened, plants of lower elevations to montane.....	<i>Helianthus</i>
<i>Note: this distinction is difficult. Check both genera!</i>	
19. Leaves divided or pinnatifid (divided to the midrib).....	20
19. Leaves simple.....	24
20. Plants lacking basal rosettes.....	21
20. Plants with basal leaf rosettes.....	22
21. Plants perennial, leaves not strongly aromatic.....	<i>Picradeniopsis</i>
21. Plants annual, leaves strongly aromatic.....	<i>Dyssodia</i>
22. Rosette of basal leaves with many divisions, tips rounded.....	<i>Bahia</i>
22. Rosette of basal leaves with few divisions, tips pointed.....	23
23. Plants of lower and middle elevations, heads <2 cm in diameter, phyllaries in 2 rows.....	<i>Picradenia</i>
23. Plants of the tundra, heads > 3 cm in diameter, phyllaries in 1 series.....	<i>Rydbergia</i>
24. Plants with woolly hairs, ray flowers becoming papery in age.....	<i>Psilostrophe</i>
24. Plants not as above.....	25
25. Plants annual, leaves opposite.....	26
25. Plants perennial, leaves alternate.....	27
26. Plants with a lemony aroma, leaves linear.....	<i>Pectis</i>
26. Plants lacking lemony aroma, leaves lanceolate.....	<i>Flaveria</i>
27. Leaves linear lanceolate, plants with basal leaves or appearing as a tight cushion.....	<i>Tetraneuris</i>
27. Plants not as above.....	28
28. Leaves decurrent (extending downwards at base) on the stem, top of stem not woolly pubescent, ray flowers not drooping.....	<i>Helenium</i>
28. Leaves not decurrent, top of stem woolly, ray flowers slightly drooping... <i>Dugaldia/Helenium hoopesii</i>	

**GROUP D: PLANTS WITH DISK FLOWERS AND YELLOW RAYFLOWERS; PAPPUS COMPOSED OF BRISTLES
(SENECIO-GOLDENROD GROUP)**

1. Leaves opposite.....	<i>Arnica</i>
1. Leaves alternate.....	2
2. Phyllaries mostly in a single series (may be a few smaller ones at the base).....	3
2. Phyllaries in 2 or more series.....	7

3. Heads turban shaped, usually nodding when young, leaves somewhat succulent and often aromatic.....	<i>Senecio "Ligularia group"</i>
3. Plants not as above.....	4
...	
4. Leaves reduced in size on upper portion of stem, heads erect, plants with woody caudices (stem bases at or just below the ground)	<i>Senecio "Packera group"</i>
4. Leaves more or less equal in size throughout stem, noticeable.....	5
5. Leaves with minute teeth (use a lens) on the margins... <i>Senecio "Lugentes group"</i>	
5. Leaves lacking minute teeth on the margins	6
6. Plants with numerous stems forming bushy clumps, leaves linear.....	<i>Senecio "Suffruticosi group"</i>
6. Plants with few or single stems, leaves not linear.....	<i>Senecio "Triangulares group"</i>
7. Heads small and numerous.....	8
7. Heads few and relatively large.....	9
8. Leaves all linear.....	<i>Euthamia</i>
8. Leaves broader, or only a few upper leaves linear.....	<i>Solidago</i>
9. Leaves pinnatifid (divided to midrib).....	<i>Machaeranthera pinnatifida</i>
9. Leaves entire or only toothed.....	10
10. Plants annual, leaves with spiny teeth on margin, resembling <i>Grindelia</i>	<i>Rayjacksonia</i>
10. Plants perennial, not as above.....	11
11. Leaves not mostly basal, always entire.....	12
11. Leaves mostly basal, sometimes toothed on margins.....	14
12. Involucre ca 1 cm high, pappus brownish.....	<i>Oonopsis</i>
12. Involucre <1 cm high, pappus white.....	13
13. Pappus double, consisting of short outer bristles or scales and longer inner bristles, phyllaries narrow.....	<i>Heterotheca</i>
13. Pappus single, phyllaries broad.....	<i>Oreochrysum</i>
14. Plants with heads solitary on long stems.....	<i>Pyrrcoma</i>
14. Plants with heads on short stem, barely longer than basal leaves.....	<i>Tonestus</i>

KEY E: PLANTS WITH INVOLUCRES A SPINY BUR (THISTLE-LIKE GROUP)

1. Leaves with spiny margins.....	2
1. Leaves lacking spiny margins.....	4
2. Pappus bristles plumose (feathery), receptacle bristly.....	<i>Cirsium</i>
2. Pappus bristles simple, receptacle barbed.....	3
3. Receptacle not honey-combed or fleshy.....	<i>Carduus</i>
3. Receptacle fleshy, honey-combed on the surface.....	<i>Onopordum</i>
4. Heads spherical, phyllaries slender with hooked tips, leaves large, cordate (heart-shaped) ovate.....	<i>Arctium</i>
4. Plants not as above.....	5
5. Phyllaries fused into a simple spiny bur.....	6
5. Phyllaries separate, spines, if present, occurring along margins	<i>Centaurea</i>

- 6. Heads small, less than 1 cm tall, spines not hooked.....*Ambrosia*
- 6. Heads over 1 cm tall, "bur" spines hooked.....*Xanthium*

KEY F: PLANTS WITH PAPPUS OF PLUMOSE (FEATHERY) BRISTLES (RABBITBRUSH-LIKE GROUP)

- 1. Plants true shrubs.....2
- 1. Plants herbaceous or woody only at the base.....5
- *2. Plants dioecious (male or female).....*Baccharis*
- *2. Plants with perfect flowers.....3
- *Note: this is a tough decision even with good flowers. *Baccharis* is an uncommon genus here: we have only *B. salicina*, a species that looks a lot like a willow and grows in floodplains of the Arkansas River drainage, and the uncommon *B. wrightii*, which is low, bushy shrub of rimrock outcrops of limestone in the very southern portion of our area. The other genera are much more likely to be encountered.
- 3. Leaves scabrous (scratchy), flowers white or greenish.....*Brickellia*
- 3. Leaves not scabrous, flowers yellow.....4
- 4. Phyllaries +/- of equal length; plants low shrubs, with white hairy leaves.....*Tetradymia*
- 4. Phyllaries in several imbricate (layered) rows; plants low or tall shrubs, sometimes whitish.....*Chrysothamnus/Ericameria*
- 5. Plants woody at the base.....6
- 5. Plants herbaceous.....8
- 6. Flowers yellow.....7
- 6. Flowers white to cream-colored*Brickellia*
- 7. Heads small, involucre less than 1 cm high.....*Chrysothamnus/Ericameria*
- 7. Heads larger, involucre more than 1 cm high.....*Oenopsis*
- 8. Leaves opposite or whorled in circle around stem.....9
- 8. Leaves alternate.....11
- 9. Leaves opposite, flowers white or creamy.....*Ageratina*
- 9. Leaves whorled, flowers purplish.....*Eupatorium*
- 10. Flowers yellow, leaves opposite.....*Arnica*
- 10. Flowers white to pinkish purple, leaves whorled.....*Eupatorium*
- 11. Flowers all alike, perfect (look for anthers-use a lens).....12
- 11. Flowers not all alike, outer flowers all female or plants dioecious.....17
- 12. Flowers yellow or orange.....13
- 12. Flowers lavender, pink, or white to creamy white.....15
- 13. Plants annual garden weeds, heads lacking ray flowers.....*Senecio vulgaris*
- 13. Plants perennial, not as above.....14
- 14. Heads turban shaped, nodding, succulent.....*Senecio "Ligularia group"*
- 14. Heads erect, not turban shaped or notably succulent.....*Senecio "Packera group"*
- 15. Flowers white or creamy.....*Brickellia*
- 15. Flowers purple.....16
- 16. Flowers in spike-like racemes.....*Liatris*

16. Flowers in flat-topped clusters.....	<i>Vernonia</i>
17. Plants with tap roots.....	18
17. Plants with fibrous roots.....	20
18. Plants annual, with a single ball-like leaf cluster.....	<i>Evax</i>
18. Plants annual or perennial, steam leafy.....	19
19. Heads small, less than 5 mm in diameter, stem < 20 cm tall.....	<i>Gnaphalium</i>
19. Heads larger, over 5 mm in diameter, stem >30 cm tall.....	<i>Pseudognaphalium</i>
20. Basal leaves present, stem often with rhizomes or stolons (“runners”), plants forming patches.....	<i>Antennaria</i>
20. Basal leaves usually lacking, plants sometimes with rhizomes but lacking stolons.....	<i>Anaphalis</i>

KEY G: PAPPUS NOT PLUMOSE, CONSISTING OF SCALES, TEETH OR AWNS OR ENTIRELY LACKING (SAGEBRUSH-LIKE GROUP AND OTHERS)

1. Phyllaries sticky gummy, tips recurved.....	<i>Grindelia</i>
1. Phyllaries not sticky gummy with recurved tips.....	2
2. Heads of separate sexes: involucre of female heads with hooked bristles or spines; corollas inconspicuous, greenish.....	3
2. Heads not as above.....	4
3. Female involucre with hooked spines.....	<i>Xanthium</i>
3. Female involucre with straight spines or knobs.....	<i>Ambrosia</i>
4. Leaves opposite.....	5
4. Leaves alternate or basal.....	8
5. Leaves triangular with long extended tips; plants low, rounded bushes.....	<i>Pericome</i>
5. Leaves not triangular, plants not as above.....	6
6. Plants tall and weedy with cordate (heart-shaped), sunflower-like leaves.....	<i>Cyclachaena</i>
6. Plants low annuals with dissected leaves.....	#
7. Phyllaries with glandular spots, plants strongly aromatic.....	<i>Dyssodia</i>
7. Phyllaries not glandular, plants not strongly aromatic.....	<i>Schkuhria</i>
8. Receptacle chaffy or bristly.....	9
8. Receptacle not chaffy or bristly, sometimes hairy.....	10
9. Leave oblong, heads single in leaf axils, nodding.....	<i>Iva axillaris</i>
9. Leaves large, triangular-ovate, heads in panicles.....	<i>Cyclachaena xanthifolia</i>
10. Pappus consisting of scales.....	11
10. Pappus absent, or only a minute set of teeth.....	13
11. Leaves entire, flowers pink.....	<i>Palafoxia</i>
11. Leaves pinnatisect (divided to the midrib).....	12
12. Phyllaries with papery tips.....	<i>Hymenopappus</i>
12. Phyllaries with green tips.....	<i>Chaenactis</i>
13. Phyllaries in 1 series, leaves linear, plants glandular, often sticky, annuals.....	<i>Madia</i>

13. Phyllaries in several series, annuals, perennials or shrubs, not sticky.....14
14. Flowers yellow, in flat-topped clusters or solitary.....15
14. Flowers greenish yellow, in spikes, panicles, or racemes.....*Artemisia*
15. Plants low herbs, smelling of pineapples.....*Matricaria*
15. Plants taller, aromatic with a medicinal odor.....*Tanacetum*

Achillea "yarrow"

Achillea millefolium L.

Syn. *Achillea lanulosa* var. *alpicola*

Plants up to 1 m, but usually less in our region especially at higher elevations. Stems soft woolly hairy; leaves finely divided and fern-like, distinctly aromatic. Heads of white ray flowers and pale disk flowers, in terminal, somewhat flat-topped, clusters.

Habitat: Meadow and fields, from the plains to the tundra.

Notes: This is a native species, formerly treated as *A. lanulosa*, but now regarded as native variety of the Eurasian species *A. millefolium*. Its aroma is unmistakable, and has led to numerous suggested medicinal uses for the plant.

Ageratina "thoroughwort, fragrant snakeroot"

Ageratina herbacea (A. Gray) King & Robinson

Syn. *Eupatorium herbaceum*

Plants perennial, stems to 80 cm. Leaves opposite, ovate to triangular ovate, bases truncate to somewhat cordate (heart-shaped), margins obscurely toothed, apex acute. Flowers 10-20 per head, white to somewhat purplish.

Habitat: Meadows, montane to subalpine zones.

Notes: Somewhat uncommon here. Look for the pale flowers and opposite leaves. This is easily confused with some species of *Brickellia* (see *Brickellia* discussion of species differences).

Agoseris "mountain dandelion, false dandelion"

Agoseris species resemble dandelions, but lack the recurved phyllaries of our most common species, the weedy *Taraxacum officinalis* or common dandelion. *Agoseris* is native in our area.

Agoseris aurantiaca (Hooker) Greene

Plants up to about 0.5 m; leaves somewhat narrow to oblanceolate, entire to deeply divided. Heads few, ray flowers deep orange, drying to a purplish color.

Habitat: Meadows and forested areas, from the montane to the subalpine.

Notes: Relatively small headed in comparison to *A. glauca*. Look for the distinctive orange flowers.

Agoseris glauca (Pursh) Rafinesque

Plants highly variable in size and pubescence. Leaves, primarily basal, also variable in size and shape.

Heads generally relatively large, up to 2 cm or more in width, with yellow flowers.

Habitat: Meadows, montane to subalpine.

Notes: An extremely variable species in all aspects; very common in mid to upper elevation meadows. Look for the yellow flowers.

Agoseris parviflora has also been reported from this region. The leaves are deeply divided; ray flowers are also yellow. It apparently prefers dry habitats such as pinyon pine-juniper or oak thickets.

Ambrosia "ragweed"

The ragweeds are the bane of all hayfever sufferers, a late season blast of pollen. None are showy plants, and all but a few species are regarded as unpleasant weeds. The spike of small heads (male or female, since the genus is monocious) is characteristic. The pistillate (female) heads (look below the staminate heads with the pollen) have a burlike involucre, with tubercles or spines that are often diagnostic for the species. The leaves are quite diverse in this genus. Some of the ragweed species were formerly placed in the genus *Franseria*, which is now included under *Ambrosia*.

Ambrosia acanthicarpa Hooker

Plants annual, to about 1 m. Leaves mostly lobed, delta-shaped overall, alternate above and opposite below. Leaves with stiff hairs. Fruits with several circles of stiff sharp spines.

Habitat: Fields, gardens, and roadsides.

Notes: An abundant, apparently native, weed.

Ambrosia artemisiifolia L.

Plants annual, up to or over 1 m when mature. Stem and leaves blue-green, leaves opposite below, alternate above, pinnately divided, segments narrow, leaves appearing grayish beneath. Fruits with a row of spines on one side.

Habitat: Roadsides, fields, disturbed areas.

Notes: Uncommon or little collected in our region; easily confused with *A. acanthicarpa*, but lacking the sharp spines on the burs and with more pubescence on the lower surface of the leaves. Both species have leaves that resemble some species of *Artemisia*.

Ambrosia confertifolia DeCandolle

Plants perennial, stem to about 0.5 m, pubescent with appressed or spreading hairs. Leaves bipinnatifid into oval or linear segments. Heads glandular, short hairy, or gland dotted (use a lens). Similar to *A. linearis*, but with broader leaves that are less prominently white below and lack notable revolute margins.

Habitat: Dry prairie, roadsides, Arkansas River drainage.

Notes: Possibly occurring in Pueblo Co., but not recorded north of the lower Arkansas Valley.

Ambrosia linearis (Rydberg) Payne

Plants perennial, usually less than 20 cm. Leaves narrowly linear with few divisions, ca 1 cm long, sessile. Leaf margins revolute (with bent under margins), showing as green edges against a white woolly hairy underside (tomentose).

Habitat: Roadsides, playa lake basins on the plains, on clay-rich soils.

Notes: This species is an endemic of the eastern plains of south-central Colorado. It can be relatively locally common along roadsides where moisture gathers off road surfaces, but the native habitat is the seasonally wet lake and lowland basins (playas). These habitats are unusual and perhaps threatened, and the species is of conservation concern. Look for the rolled leaf margins and the green-on-white coloration. See also *A. confertifolia*, a look alike.

Ambrosia psilostachya DeCandolle

Plants perennial with deep taproots. Stems 30-80 cm, canescent-strigose (with short stiff hairs). Leaves twice pinnatifid, with segments divided to the midrib, with gray hairs on both sides, somewhat thick.

Habitat: Disturbed areas on the plains through lower foothills.

Notes: Extremely common weedy native species.

Ambrosia tomentosa Nuttall

Plants perennial, to about 0.5 m. Stems with long tangled hairs, becoming glabrous and brown in age. Leaves mostly alternate, twice pinnatifid, segments broad, divided to the midrib, dark green above and white-pubescent below.

Habitat: Sandy areas on the plains.

Notes: A distinctive species, relatively uncommon or little collected in our region. Look for the long tangled hairs on the stem and the broad segments, and a tall stout growth form.

Ambrosia trifida L.

Plants tall, stems to or exceeding 1 m. Leaves opposite, broadly ovate, palmately lobed with 3-5 lobes. Fruits 4-5 ribbed, with short conical spines.

Habitat: Disturbed areas, plains to lower foothills; especially common along roadsides and trails.

Notes: This adventive species is one of the worst offenders for hayfever. Look for the tall stem and broad lobed leaves. This tall ragweed can look like *Cyclachaena xanthifolia* with its height and large leaves. *Cyclachaena* has entire (but slightly lobed) leaves; *A. trifida* usually has notably divided leaves.

***Anaphalis* "pearly everlasting"**

Anaphalis margaritacea (L.) Bentham & Hooker

Plants to about 0.5 m, usually less. Stems single off a rhizome, with narrow stem sessile (lacking a petiole) leaves, lacking basal rosettes. Heads terminal on upper branches; phyllaries in several rows, outer pearly white and scarious (thin, dry). Ray flowers lacking; disk flowers mostly female, occasionally with a few central male flowers.

Habitat: Montane meadows and forests.

Notes: Resembling a large single stemmed *Antennaria*; common throughout our region, but especially in Teller County forests and meadows. The common name refers to the white phyllaries, which are prominent in late anthesis.

***Antennaria* "pusstoes"**

Antennaria is an easily recognizable genus, with prostrate mats of ovate to elliptical, often gray green, basal leaves abundant in the forests of the lower foothills to the tundra. Getting *Antennaria* to species level, however, can often be a challenge. It is difficult to identify whether species are bisexual, dioecious, or apomictic, and some species hybridize! Look for stolons (runners, as in strawberries) for some helpful distinctions, along with the color of the leaves. The descriptions here are general guidelines for our region.

Antennaria media Greene

Plants mat-forming, with leafy stolons, leaves white-tomentose on both sides. Outer phyllaries blackish-green at the apex.

Habitat: Subalpine and alpine meadows.

Notes: One of the higher elevation species. Look for the white hairs on both sides of the leaves and the black-green phyllaries.

Antennaria microphylla Rydberg

Plants mat-forming, with leafy stolons, leaves white tomentose on both sides, obovate. Outer phyllaries yellowish green; inflorescence and upper stem leaves glandular.

Habitat: Dry areas, foothills and montane.

Notes: Look for the yellowish-green phyllaries and glandular upper part of the stem.

Antennaria neglecta Greene

Syn. *Antennaria howellii* ssp. *neodioica*

Plants mat-forming, with leafy stolons, leaves green above, lanceolate-elliptical, heads with male and female flowers or all female flowers. Phyllaries white, lacking a brown spot.

Habitat: Mesas and lower foothills, meadows and open areas in forests.

Note: Look for the stolons, and leaves that are green above.

Antennaria parvifolia Nuttall

Plants mat-forming, with leafy stolons. Leaves white tomentose on both sides, heads rather large, with an involucre to about 1 cm high.

Habitat: Montane forests and meadow edges.

Notes: Look for the large heads; one of our most common *Antennaria* species.

Antennaria pulcherrima (Hooker) Greene

Syn. *Antennaria anaphaloides*

Plants not mat-forming and lacking leafy stolons. Leaves with parallel venation.

Habitat: Dry meadows, foothills to montane.

Notes: A very common species; lacking a mat growth form; it typically occurs as a single rosette.

Antennaria rosea Greene

Plants mat-forming; with leafy stolons. Leaves white tomentose on both sides, heads small, often pinkish in color.

Habitat: Montane to subalpine forests and lower foothills.

Notes: A very common species, similar to *A. parvifolia* but with smaller heads. Although this species is often pink in color, other species can also be pink, so look carefully at all the characters.

***Arctium* "burdock"**

Arctium minus (J. Hill) Bernhardt

Plants biennial, with a rosette of large, cordate (heart-shaped) hairy leaves the first year; stems to 3 m the second year. Leaves hairy, margins somewhat wavy. Heads with purple flowers, numerous, typically from leaf axils or stem branches. Heads prominently covered with numerous long, slender, hooked spines.

Habitat: Disturbed areas, especially in the lower elevations.

Notes: A very common adventive species throughout our region. Look for the slender hooked spines on the phyllaries of the rounded involucre. *Arctium* and *Xanthium* can be superficially similar; see comments under *Xanthium*.

***Arnica* "arnica"**

The arnicas resemble some species of *Senecio* in having medium sized heads with bright yellow ray flowers, but can always be distinguished from *Senecio* by their opposite leaves (*Senecio* in its broad sense, including segregates like *Packera*, has alternate leaves).

Arnica chamissonis Lessing

Plants to about 0.4 m, stems single, leafy. Leaves tapering at both ends. Heads several, relatively small, to about 2 cm.

Habitat: Meadows, montane zone.

Notes: This species is common elsewhere in Colorado, though its distribution here is unclear. We have few records for the region. Look for a tuft of hairs near the tip of the phyllaries.

Arnica cordifolia Hooker

Plants to about 0.5 m, stems single, soft hairy. Leaves petiolate, to about 10 cm in length, heart-shaped and soft hairy. Heads large, ray flowers bright yellow, about 3 cm long. Disk flowers yellow.

Habitat: Moist meadows and thickets, montane and subalpine zone.

Notes: A common and highly variable upper elevation species, with an unmistakable leaf shape.

Arnica fulgens Pursh

Plants usually less than 0.5 m, stems single, somewhat hairy glandular. Leaves lanceolate, petiolate at least on the upper stem, older leaf bases with brownish hairs in the axils. Heads solitary, ray flowers to ca. 3 cm.

Habitat: Meadows and forest openings, lower foothills to montane.

Notes: Occurs in somewhat drier habitats than *A. cordifolia*, and having distinctive brown hairs in the lower leaf axils.

Arnica latifolia Bongard

Plants relatively short, to about 20 cm. Stems slender, somewhat sticky glandular. Leaves sessile, oval to triangular, margins toothed. Heads about 3 per stem, ray flowers about 2 cm long.

Habitat: Moist shady areas in the forested zone, upper montane to subalpine.

Notes: This species shares a habitat *A. cordifolia*, but differs in the leaf morphology and plant size. Look for the shorter stems and non-heart shaped leaves.

Arnica parryi Gray

Plants to ca. 0.5 m. Stems slightly sticky glandular. Flowers rayless, nodding, brownish-yellow.

Habitat: Montane slopes and open forests.

Notes: This is a very distinctive species with its rayless, nodding heads. Its distribution here is uncertain, but it occurs at least near the margins of the Pikes Peak region.

Arnica rydbergii is a tundra species similar to *A. fulgens*, but lacking tawny hairs in the leaf axils. It is likely to occur on Pikes Peak, but we have no documented records.

***Artemisia* "sagebrush"**

No plant exemplifies the American West more than sagebrush. The sage of the movies refers usually to *Artemisia tridentata*, a tall, shrubby species with 3-toothed leaves that does not occur in the Pikes Peak

region except as horticultural introduction. We have multiple other species, however. Some botanists split the genus into separate ones, including *Seraphidium* and *Oligosporus*, depending on whether ray flowers and/or fertile disk flowers are present or not. Since this is a difficult distinction, they are placed here in the inclusive genus *Artemisia*. Not all species smell “sagey”; the non-aromatic ones are noted in the descriptions. The common shrub winterfat (*Krascheninnikovia lanata*; Chenopodiaceae) can superficially resemble sagebrush, but is white woolly and does not smell.

Artemisia absinthium L.

Plants perennial, herbaceous, stem leaves present but basal rosettes withering by flowering time; leaves pinnatisect with rounded lobes.

Habitat: Cultivated fields and disturbed areas; low elevations.

Notes: An uncommon adventive species, but potentially problematic if it spreads. Look for the deeply divided leaves with broader segments than in the common *A. frigida*, and lack of basal leaves.

Artemisia biennis Willdenow

Plants biennial, herbaceous, stems to a meter or more; stem leaves present, basal rosettes withering; leaves pinnatisect, with sharp-pointed lobes.

Habitat: Disturbed areas, forest roads and trails, montane and foothills.

Notes: Somewhat uncommon here or at least undercollected. Look for the sharply pointed leaf lobes.

Artemisia bigelovii A. Gray

Plants shrubby, usually less than 1 m but often spreading into rounded bushes. Leaves gray green, with 3-lobed tips.

Habitat: Common on lower elevation alkaline barrens, dry hillsides, and rocky outcrops in Pueblo and Fremont Counties; rare in El Paso County.

Notes: Similar to a short stubby *A. tridentata* with its 3-lobed leaf tips; almost always occurs on limestone or calcareous chalks or shales.

Artemisia campestris L. var. *caudata* (Michx.) Palmer & Steyermark

Syn. *Artemisia caudatus*; *Oligosporus caudatus*

Plants biennial or monocarpic (living to bloom only once); leaves bright green, glabrous (lacking hairs), withering at flowering time.

Habitat: Sandy soils and dunes on the plains.

Notes: These two varieties of *A. caudatus* are easily distinguished in our area: var. *pacifica* has much more hairy leaves than var. *caudatus*. Some botanists separate them at the species level, others integrate them as a single variable species.

Artemisia campestris L. var. *pacifica* (Nuttall) Peck

Syn. *Oligosporus pacificus*

Plants biennial or monocarpic; leaves silvery gray, hairy.

Habitat: Gravelly soils, plains to montane.

Notes: See comments under var. *caudatus*.

Artemisia cana Pursh

Syn. *Seriphidium canum*

Plants tall shrubs, with simple broadly linear, sometimes somewhat lobed, leaves. Stems grey-tomentose.

Habitat: Moist areas, along streams, lower elevations.

Notes: Distribution and abundance in our region are not yet fully known. Look for the almost linear leaves. This species can resemble *A. tridentata* and the two may possibly hybridize.

Artemisia carruthii Wood

Plants herbaceous but with slightly woody stem bases; stems to about 30 cm, densely leafy with finely divided leaves; inflorescence a dense spike, plants often forming patches.

Habitat: Plains grasslands, in sandy soil.

Notes: A characteristic species of the plains. Look for the woody base, the dense spike and finely divided leaves.

Artemisia dracunculus L.

Syn. *Oligosporus dracunculus*

Plants perennial, herbaceous, lacking basal leaves at flowering. Leaves glabrous, simple, narrow, to about 2 mm wide. Not aromatic.

Habitat: Lower to middle elevations, mesas, forests, and roadsides.

Notes: A very common species; look for the narrow leaves that give it the common name of wild tarragon. This species has no "sagey" smell.

Artemisia filifolia Torrey

Syn. *Oligosporus filifolius*

Plants shrubby, to about 1 m and forming large clumps. Leaves narrowly linear to filiform, silvery, aromatic.

Habitat: Sandy soil on the plains.

Notes: A very distinctive and beautiful species that dominates the sand sage prairie of southeastern El Paso and northern Pueblo Counties.

Artemisia franserioides Greene

Plants rhizomatous, heads in 1-sided ("secund") spikes, leaves twice divided, lobes with rounded apices. Sweetly aromatic.

Habitat: Rocky slopes, ledges, forest openings, middle elevations.

Notes: Somewhat uncommon or rarely collected since its habitat can be difficult to access. Look for the rhizomes and sweet odor. More common in the Wet Mts. than in the Pikes Peak region.

Artemisia frigida Willdenow

Plants herbaceous above and woody below, forming short silvery clumps with finely dissected leaves. Aromatic.

Habitat: Plains, mesas, dry meadows up to the alpine.

Notes: Extremely abundant and widespread species at all elevations. Look for the finely divided leaves.

Artemisia ludoviciana Nuttall

Plants herbaceous, rhizomatous, appearing as a single stem or a few together. Leaves extremely variable, from entire to divided, usually quite silvery. Inflorescence open, somewhat spreading. Plants aromatic.

Habitat: Plains to montane, often in disturbed areas including steep slopes, rock slides, roadsides and open grasslands.

Notes: The variation in this extremely common species is enormous although most often the leaves are entire.

Artemisia pattersonii A. Gray

Plants herbaceous, usually less than 10 cm, leaves pinnatisect (divided to the midrib); phyllaries with a narrow dark margin and appearing bicolored.

Habitat: Alpine tundra on Pikes Peak.

Notes: One of our tundra sage species; it differs from *A. scopulorum* in having fewer heads and narrower dark margins on the phyllaries.

Artemisia scopulorum A. Gray

Plants herbaceous, usually less than 10 cm (occasionally taller), leaves twice pinnatisect; phyllaries with a broad dark margin.

Habitat: Alpine and subalpine meadows.

Notes: Common on dry tundra and in subalpine meadows; similar to *A. pattersonii* but with a broader margin on the phyllaries and doubly divided leaves.

Aster/Symphotrichum "aster"

Most of our traditional aster species are now placed into the genus *Symphotrichum*, with only *Aster alpinus* (which does not occur here) representing a true "aster" (for genetic reasons). For simplicity, they are treated

here with the traditional name, with alternatives. Modern genetic analysis confirms the validity of splitting this large genus into different genera, and some several botanists have already suggested *Virgulus*, *Eucephalus*, *Almutaster*, and *Virgulaster* as possibilities in addition to *Symphotrichum*. However, it is not possible to easily distinguish these on the basis of morphological characters, and a reliable key is challenging. Our species are numerous and abundant across the landscape, often very similar except for small differences in hairs or leaves. Some can be difficult to distinguish from daisies, the genus *Erigeron*. To distinguish *Aster* in a broad sense from the lookalike daisy- *Erigeron*, it is often helpful to look at the phyllaries. In *Erigeron* they are typically in a single row, appearing all more or less of the same length, whereas *Aster* shows several rows, a "shingled" appearance. Asters often have leafy stems and broader ray flowers than daisies, but this difference is not always reliable! Check also that the phyllaries are not recurved: *Machaeranthera* species (tansy aster) looks like an aster but show the distinctive bent-back phyllary that is never seen in *Aster*. The distinctive genus *Brachyactis*, formerly included in *Aster*, is separated out here on the basis of the distinctive puffy pappus and annual growth habit. Otherwise, the segregate genera for aster are treated under the broader concept here.

PURPLE- BLUE FLOWERED SPECIES

Aster foliaceus Lindley

Syn. *Symphotrichum foliaceum*

Plants with stems around 1 m, leaves and stems often hairy and/or glandular. Leaves broad, > 4 cm long, heads 1-3 per stems with leaf-like outer phyllaries; heads over 2 cm in diameter.

Habitat: Montane and subalpine meadows and rocky sites.

Notes: Very common, but variable in leaf sizes. Look for the leaflike broad phyllaries and upper bracts.

Aster laevis L.

Syn. *Symphotrichum laeve*

Plants up to 1 m, leaves and stem glabrous, leaves somewhat glaucous (with a bluish-white surface color), up to 20 cm long, lanceolate, margins entire to somewhat toothed, bases distinctly cordate and clasping the stem.

Habitat: Dry to moist areas, including streambanks, plains through the montane. Extremely common.

Notes: The species name "smooth" (*laevis*) comes from the lack of hairs on this species; most other asters have some hairs on the stems or leaves. The clasping leaf bases are also diagnostic. The flowers on this species can also be whitish in color though the most common color is purple.

Aster lanceolatus Willdenow ssp. *hesperius* (A. Gray) Semple & Chmielewski

Syn. *Symphotrichum lanceolatum* ssp. *hesperius*; *Aster hesperius*

Plants up to 1 m, stem with hairs below the heads in distinct lines extending below the base of the leaves, leaves clasping the stem. Ray flowers purple.

Habitat: Wet areas, lower elevations to montane.

Notes: Common species, and very distinct with the lines of hairs below the leaves. The flowers are less showy than in *A. foliaceus* and the involucre bracts less prominent.

Aster spathulatus Lindley

Syn. *Aster occidentalis*; *Symphotrichum spathulatum*

Plants up to 0.5 m, stems pubescent; leaves on upper portion of stem much smaller than lower leaves.

Phyllaries almost equal in length, appearing like an *Erigeron* in this respect. Ray flowers purplish.

Habitat: Moist montane meadows and streamsides.

Notes: This species can be mistaken for a large-flowered *Erigeron*. Look for the small upper leaves. This species may hybridize with *A. foliaceus*.

ASTER: "VIRGULUS GROUP" This group of *Aster*-like species can be challenging, and it is not easy to provide easy distinctions in a key. All are somewhat or extremely weedy in our region and appear in disturbed areas, often along roadsides or, in the case of *A. novae-angliae*, in creek drainages and floodplains. Pink or purple-flowered species include *A. novae-angliae* (probably now a horticultural escape here) and *A. ascendens*, and our white-flowered species include the extremely common *A. falcatus*, *A. fendleri*, and *A. ericoides*. *Aster ascendens* can be white or purplish.

Aster ascendens Lindley

Syn. *Aster chilensis* ssp. *ascendens*; *Symphotrichum chilense*

Plants to about 0.5 m; stems clumped, wiry, somewhat reddish. Leaves lanceolate, to about 10 cm long, typically pointing upwards. Heads to about 3 cm in diam., ray flowers purple to white. Involucres strongly imbricate, lower phyllaries obtuse, with green centers and pale thickened margins.

Habitat: Roadsides, wetlands, most commonly in middle elevations, rarely lower.

Notes: Look for the pale thickish margins on the phyllaries and the "ascending" look of the leaves.

Aster fendleri Gray

Syn. *Virgulus fendleri*; *Symphotrichum fendleri*

Plants less than 1 m, stems branched from the base; leaves linear, less than 3 cm in length, ciliate with marginal hairs. Heads numerous, relatively small. Stems hairy, with spreading hairs.

Habitat: Meadows, roadsides, the plains to montane.

Notes: Extremely common in late summer. See notes on *A. falcatus*, *A. fendleri*, and *A. porteri*.

Aster novae-angliae L.

Syn. *Symphotrichum novae-angliae*

Plants over 1 m, somewhat bushy, leaves over 3 cm long and broadly lanceolate. Rays bright red-purple, with dark phyllaries.

Habitat: Monument Creek floodplain; possibly present in other moist locations on the plains.

Notes: Although this species probably occurred in our region as a native at one time, it seems to occur here now only as a horticultural escape. It is a species of New England (hence its species name) and common west to the Great Plains where it occurs in wetland pockets with other cool-climate relicts. Plains locations away from habitation should be documented as possible native populations.

WHITE-FLOWERED SPECIES: SEE ALSO *ASTER LAEVIS* UNDER PURPLE-FLOWERED SPECIES.

Aster junciformis Fries

Syn. *Symphotrichum boreale*; *Aster borealis*

Plants ca. 0.5 m, upper portion of stem pubescent. Leaves narrow, usually less than 5 mm wide. Heads few and relatively small, less than 1 cm high, ray flowers white.

Habitat: Relatively rare or uncommon in montane wetlands.

Notes: A fairly distinctive delicate species with very narrow leaves (rushlike, hence the species name "*junciformis*") and a wetland habitat; otherwise similar to *Aster porteri*.

Aster porteri A. Gray

Syn. *Symphotrichum porteri*

Plants ca. 0.5 m, stems much branched from the base, with narrow, almost linear leaves, glabrous, heads numerous (about 10 per stem), ray flowers white, involucres about 5 mm high.

Habitat: Foothills and montane in relatively dry sites, especially in canyons, along logging roads and in dry meadows. Sometimes also in grasslands of the high plains around the Black Forest.

Notes: Extremely common in the late summer, one of several small-headed, white flowered asters. See also the *Virgulus*-group for several lookalike species. *A. porteri* can be distinguished by its glabrous stems and the branching from the base. See also *Unamia alba*, *Aster falcatus*, *A. ericoides*, and *A. fendleri*.

VIRGULUS GROUP: WHITE FLOWERED SPECIES: SEE ALSO *ASTER FENDLERI* AND *ASTER ASCENDENS*

Aster ericoides L.

Syn. *Virgulus ericoides*, *Symphotrichum ericoides*

Plants less than 1 m, leaves linear to somewhat oblong, with a slightly spiny tip, less than 3 cm in length. Heads numerous, relatively small, less than 5 mm in height. Stems hairy, with hairs appressed or pointing upward.

Habitat: Meadows, roadsides on the plains and throughout the montane.

Notes: This is an extremely common species of the late summer; easily confused with *A. falcatus* (distinguished by its spreading hairs), *A. fendleri* (which typically has purple flowers, but rarely with white

forms), and *A. porteri* (which lacks hairs). *Aster porteri* has somewhat larger flowers than either *A. ericoides* or *A. falcatus*.

Aster falcatus Lindley

Syn. *Virgulus falcatus*, *Symphotrichum falcatum*

Plants less than 1 m, stems much branched. Leaves linear, tip slightly spiny, less than 3 cm in length.

Heads numerous, relatively small, less than 5 mm in height. Stems pubescent, hairs spreading.

Habitat: Dry meadows, roadsides, lower elevations to montane.

Notes: Common species of late summer. Easily confused with *A. falcatus*, but differing in having spreading rather than erect hairs and the slightly spine-tipped leaves (also in *A. ericoides*)

***Baccharis* "groundsel tree"**

Baccharis salicina Torrey & Gray

Plants tall shrubs usually over 1 m, stems leafy, somewhat sticky resinous, glandular dotted (use a lens).

Leaves to 5 cm long, oblong to oblong lanceolate or linear lanceolate. Heads in paniculate clusters, involucre 4-8 mm high. Pappus white, elongating in fruit.

Habitat: Saline soils in the Arkansas River drainage.

Notes: An uncommon species in our region, but documented along the Arkansas River in the Pueblo area; more common in SE Colorado. This species strongly resembles a willow, so check fruits to distinguish it as well as the sticky leaves and stem, not seen in willows.

Baccharis wrightii A. Gray

Plants woody at the base only, stems relatively low, ca 0.5 m. Leaves linear, to 3 cm long. Heads to about 1 cm high.

Habitat: Rocky and sandy areas, mesas, low elevations.

Notes: Known primarily from SE Colorado but with a few scattered locations in southern Pueblo County on rocky slopes of the Huerfano Uplands.

***Bahia* "field chrysanthemum"**

Bahia dissecta (A. Gray) Britton

Plants annual, with a solitary stem up to 0.5 m, from a basal rosette of once or twice divided leaves. Stems somewhat sticky glandular. Heads relatively few, branches of inflorescence widely spreading, ca 1-2 cm diameter; ray flowers yellow.

Habitat: Gravelly slopes, roadside, plains through montane.

Notes: This species is quite distinctive when in flower, and common on the lower slopes of Pikes Peak on unstable gravels. It also occurs commonly on the floodplains of perennial creeks.

***Bidens* "beggar's ticks"**

The common name for this genus refers to the bur-like nature of the achenes. The 2 awn-like pappus horns make the achenes stick to clothing or socks!

Bidens cernua L.

Plants tall, up to 2 m but sometimes shorter; peduncles curved just below the head thus making them nod.

Leaves simple, with serrate (sharply toothed) margins, lacking a petiole.

Habitat: Wet or muddy areas, from the plains to lower montane.

Notes: Common and somewhat weedy, often in disturbed areas. Look for the nodding head. *Bidens comosa* (*B. tripartita*), not yet recorded from our region but possibly here, is a similar species to *B. cernua*. It is shorter, does not have nodding heads, but does share the characteristic of simple rather than divided leaves. These are almost entire (not serrate) and do have a petiole. The heads do not nod.

Bidens frondosa L.

Plants up to about 1 m; heads not nodding, often lacking ray flowers. Leaves can be simple, but usually divided into 3 leaflets with serrate (sharply toothed) margins.

Habitat: Wet or muddy areas, from plains to lower montane.

Notes: Common, especially in the lowlands on the plains. Look for the divided leaves and erect heads.

Bidens tenuisecta A. Gray

Plants up to about 1 m, heads not nodding. Ray flowers few. Leaves with narrowly linear segments.

Habitat: Gravelly areas, especially along roadsides and trails on the high plains, through the foothills and montane.

Notes: A distinctive species with narrow leaf segments; unlike *Bidens cernua* and *B. frondosa*, typically growing in gravelly soils along trails or roads.

Brachyactis

This genus was formerly included within *Aster*, but our species are easily distinguished by having very short or absent ray flowers, a prominent puffy-looking pappus, and annual rather than perennial growth habit. The flowers in both species are a pale purple to whitish, and the short or lacking ray flowers make the heads nondescript in coloration.

Brachyactis ciliata Ledebour

Syn. *Aster ciliata*; *Aster brachyactis*

Plants annual, stems about 0.5 m, branching, leaves 3-10 cm, linear, entire and more or less ciliate on the margins. Ray flowers virtually absent. Pappus abundant, prominent when flowers are in fruiting stage.

Habitat: Wet areas on the plains.

Notes: Similar to *B. frondosa*, but lacking ray flowers.

Brachyactis frondosa (Nuttall) Gray

Syn. *Aster frondosa*

Plants annual, stems to almost a meter in height, leaves linear, ciliate on the margins. Ray flowers purple, present but extremely short, no more than 2 mm. Pappus abundant, prominent when flowers are in fruiting stage.

Habitat: Wet areas on the plains.

Notes: Similar to *B. ciliata*, but with short, often curled, ray flowers.

***Brickellia* "tasselflower, bricklebrush"**

Brickellia blooms in late summer, a genus characterized by the creamy-colored heads composed of only disk flowers, and a preference for dry habitats. Some species previously placed into *Kuhnia* are treated here under *Brickellia*.

Brickellia californica (Torrey & Gray) A. Gray

Plants shrubby, to about 1 m; much branched from the base; leaves triangular-ovate, margins crenate (with rounded teeth) to almost entire. Heads small, less than 1 cm high, in dense axillary clusters.

Habitat: Rocky canyon-sides.

Notes: Common in Fremont County. Look for the readily apparent woody growth and triangular leaves.

Brickellia eupatorioides (L.) Shinnery

Syn. *Kuhnia eupatorioides*; *Brickellia rosmarinifolia*; *Kuhnia chlorolepis*

Plants herbaceous, sometimes slightly woody at the base, to about 0.5 m. Leaves lanceolate to rhombic, toothed on the margins. Inflorescence somewhat dense and spike-like.

Habitat: Dry grasslands, lower elevations.

Notes: Common throughout our region. *Brickellia rosmarinifolia*, a form with more linear leaves and a spreading inflorescence, is now included in this species.

Brickellia grandiflora (Hooker) Nuttall

Plants herbaceous (but somewhat woody at the base), to about 1 m; leaves triangular-ovate, margins deeply serrate or crenate. Heads larger than 1 cm tall, nodding.

Habitat: Rocky slopes, foothills to montane.

Notes: This species somewhat resembles *B. californica*, but differs in having larger flowers and a less noticeable shrubby growth habit.

***Carduus* "musk thistle, nodding thistle"**

This genus resembles *Onopordum* (Scotch thistle) but has a densely bristly, honeycombed receptacle.

Carduus nutans L.

Plants biennial, with stout stems up to 2 m tall. Leaf bases decurrent along the stem. Stem ribs spiny. Heads large, nodding, lacking ray flowers, disk flowers purple. Phyllaries broad, very stiff and sharp.

Habitat: Grasslands, roadsides, plains and foothills to montane meadows.

Notes: This thistle relative is a common noxious adventive weed in our region that poses problems for livestock grazing. It can be identified by the decurrent leaf bases, the broad sharp phyllaries, and the nodding heads.

A related species, *Carduus acanthoides* (plumeless thistle) is known from elsewhere in CO but not yet collected in our region. It has smaller flowers than *C. nutans*, and the leaves lack a prominent midrib.

***Centaurea* "knapweed"**

The large inclusive genus *Centaurea* is sometimes now split into several segregate genera, including *Acroptilon* (Russian knapweed), *Acosta* (diffuse and spotted knapweed) and *Jacea* (brown knapweed). The species may be hybridizing, and intermediates appear to be increasingly common. The blue horticultural species known colloquially as "cornflower" or "bachelor's button", is sometimes placed into the genus *Leucacantha*. For simplicity sake, and because many are known by their common names, they are all treated here under the more inclusive genus for knapweeds, although the generic splits reflect more appropriate genetic relationships.

Centaurea cyanus L.

Syn. *Leucacantha cyanus*

Plants to about 0.5 m tall, leaves lanceolate, stems somewhat branched. Flower heads relatively large, with bright blue disk flowers. Plants not spiny.

Habitat: Naturalized in some areas, and especially common west of Palmer Lake in the lower foothills.

Notes: A horticultural species known as "bachelor's button", now naturalized but not causing the problems with invasiveness like other members of this group. That species has attractive bright blue heads.

Centaurea diffusa Lamarck

Syn. *Acosta diffusa*

Plants perennial, to about 0.5 m tall, stems widely branched. Heads small, usually white to occasionally lavender.

Habitat: Disturbed areas, burn scars, roadsides, plains through foothills and lower montane zone.

Notes: A noxious weed, currently the most common knapweed in El Paso County and spreading rapidly throughout the region. The lack of a spot on the spiny brownish phyllaries distinguishes it from *C. maculosa* (*C. stoebe*); diffuse knapweed can hybridize with *C. maculosa* and hybrids can be quite variable.

Centaurea repens L.

Syn. *Acroptilon repens*

Plants perennial, to about 0.5 m tall, stems much branched at the top, plants often forming large colonies from rhizomes. Heads purple, rarely white. Phyllaries with papery margins, lacking a black spot.

Habitat: Disturbed areas, lower elevations to montane zone.

Notes: A noxious weed species, less common than others in our region, but spreading, especially at the higher elevations. The phyllaries in this species are green with a white margin, not spiny. Look for a densely bristly receptacle and presence of fine wooly hairs on some leaf axils.

Centaurea maculosa L.

Syn. *Acosta maculosa*; *Centaurea stoebe*

Plants perennial, to about 0.5 m tall, stems with few branches. Heads about 1 cm tall, flowers purple. Phyllaries with a distinctive dark spot and comb-like margin.

Habitat: Disturbed areas, usually in the foothills, but also plains to lower montane zone.

Notes: A noxious weed species, increasing in our region, especially in northern El Paso County.

The horticultural (and apparently not invasive) species *C. dealbata* has naturalized in a limited region around Fountain. It can be recognized by its relatively large, bright pink heads.

***Chaenactis* "pincushion, false yarrow"**

Chaenactis douglassii (Hooker) Hooker & Arnott

Plants biennial, stem leafy showing remains of a basal rosette where dense tangled hairs are often present to about 20 cm high; leaves deltoid in outline, 2-3 pinnate, heads several, flowers white to flesh-colored.

Habitat: Sandy gravelly soils on steep unstable slopes in the montane zone.

Notes: Somewhat uncommon or undercollected in our region. *Chaenactis alpina* occurs at high elevations in the subalpine or alpine in similar habitats. It has not yet been documented here, but possibly occurs on Pikes Peak.

***Chrysothamnus/Ericameria* "rabbitbrush"**

Our rabbitbrush species are a common component of the late summer landscape, where they often go by the name "chamise" or "chamisso" in the Southwest. Their bright yellow heads of disk flowers and elongate leaves are distinctive. Some rabbitbrushes are placed by botanists into the genus *Ericameria* based primarily on molecular genetic evidence, but the distinctions are difficult based on morphology alone, so the traditional inclusive *Chrysothamnus* is used here. SEE ALSO *OONOPSIS ENGELMANNII*, WHICH SUPERFICIALLY CAN RESEMBLE RABBITBRUSH.

Chrysothamnus nauseosus (Pallas ex Pursh) Britton

Syn. *Ericameria nauseosa*

Plants shrubby, quite variable in height from low to tall shrubs. Stems with feltlike dense hairs (tomentum). Leaves linear-lanceolate, straight. Heads in cymes (flat or round topped inflorescence where the terminal one blooms first) at the end of branches, flowers showy, bright yellow, phyllaries not prolonged into long tips.

Habitat: Plains to montane, generally in somewhat dry habitats.

Notes: An extremely common and highly variable species. Probably the most common species of rabbitbrush in the Pikes Peak region, but one in which numerous races have been described. Look for the lack of prolonged phyllaries to distinguish this species from *C. parryi*.

Chrysothamnus parryi (A. Gray) Greene

Syn. *Ericameria parryi*

Plants shrubby, variable in height. Stems with felt-like dense hairs (tomentum). Leaves linear-lanceolate, straight. Heads in spikes or racemes at the end of the branches, flowers showy, with phyllaries prolonged at the apex in long slender tips.

Habitat: Plains to montane, generally in somewhat dry habitats.

Notes: Common and variable, especially with respect to the leaf pubescence and numbers of flowers. The long-tipped phyllaries are distinctive, and serve to separate this species from *C. nauseosus*. Several subspecies have been described.

Chrysothamnus viscidiflorus (Hooker) Nuttall

Plants low shrubs, leaves narrow and usually distinctively twisted or spiraled; flowers not as showy as in our other species.

Habitat: Dry sites, foothills to middle elevations.

Notes: The twisted leaves and smaller size of the plants are diagnostic for this species.

***Cichorium* "chicory"**

Cichorium intybus L.

Plants to 1 m, usually somewhat shorter; upper branches broadly spreading. Leaves basal, toothed or pinnately divided, up to 10 cm or more long. Stem leaves smaller, much reduced in size. Flowers bright sky blue. Plants with white sap.

Habitat: Plains, roadsides, lower foothills, meadows of the Black Forest.

Notes: An adventive species, locally common and naturalized throughout North America, and not particularly problematic as a weed. The flowers close late in the afternoons and evenings.

Cirsium "thistle"

The thistle and thistle-like group of species are placed here in an inclusive *Cirsium* complex since they are easily recognized together. The knapweeds, with which they may be confused, have smaller flowers and leaves that are not spiny. Not all our thistles are problematic weeds; the native species do not appear to spread even in disturbed areas. See also *Onopordum* for another thistle-like group, the cultivated Scotch thistle naturalized in our area, and *Carduus* (musk/nodding thistle). Both of these genera resemble thistles, but have leaf bases decurrent (extending downward) along the stem so that they connect almost the entire length of the stem. In *Cirsium*, even species with decurrent bases have separation between the leaves.

Cirsium arvense (L.) Scop.

Syn. *Breea arvensis*

Plants to ca 1 m; stems often branching. Plants forming extensive colonies from underground rhizomes. Leaves alternate, sessile (lacking a petiole), oblong to lanceolate, with spiny irregularly shaped lobes, usually glabrous beneath (rarely with hairs). Heads relatively small, to about 1 cm tall; flowers purple (rarely white).

Habitat: Roadsides, wet areas, especially along lowland streams, moist to mesic meadows, abundant at lower elevations and now extending well up into the montane zone.

Notes: An adventive noxious weed, one of our most damaging wetland plants. A very aggressive species that is almost impossible to eradicate. A race with tomentose lower leaf surfaces (*Cirsium/Breea incana*) is included here under *C. arvense*.

Cirsium canescens Nuttall

Plants biennial, usually around 1 m. Leaves lacking decurrent bases; heads large (3-4 cm tall), phyllaries reflexed backwards or spreading, flowers white or pale purple.

Habitat: Plains, mesas, usually in open grasslands.

Notes: A common native species. Look for the large heads with pale flowers.

Cirsium flodmanii (Rydberg) Arthur

Plants perennial to ca. 1 m., from rhizomes, but not forming dense patches. Heads pink, fairly small. Spines on involucre fairly long (to 4 mm), weak and slender; leaves white to gray tomentose (wooly hairy) beneath.

Habitat: Wet areas on the plains.

Notes: Superficially similar to *C. arvense*, but a native species that is much less common in our area. This species has bisexual heads, unlike *C. arvense* where the heads are only a single sex (dioecious plants).

Cirsium arvense usually (not always) has glabrous leaves, and typically grows in patches. *Cirsium flodmanii* not an invasive species, and should be considered an uncommon wetland plant.

Cirsium ochrocentrum A. Gray

Plants biennial, to about 1 m and often forming clumps. Leaves with decurrent bases, densely pubescent below and with tufts of hair above, sharply spiny with yellowish spines. Heads relatively large, flowers purple, sometimes pale or yellowish, phyllaries with long, stout, spiny tips.

Habitat: Low elevations, plains to foothill valleys, usually in sandy soil.

Notes: A relatively common native species. Look for the decurrent leaf bases and long spiny phyllaries.

Cirsium scariosum Nuttall

Syn. *Cirsium coloradense*

Plants consisting either of a large basal rosette of leaves with sessile (stemless) flower heads in the center, or a tall stem with sessile flower heads in the leaf axils. Phyllaries lacking hairs (glabrous), glandular with yellowish glands on the back surface. Flowers white.

Habitat: Subalpine and alpine meadows.

Notes: A common and distinctive native species frequent in the upper elevation zones. It can be distinguished from *C. scopulorum* by its glabrous phyllaries and lack of nodding heads. The usual growth form is the basal rosette of sessile flower heads.

Cirsium scopulorum (Greene) Cockerell

Syn. *Cirsium hesperium*

Plants perennial, up to about 0.5 m, heads congested in a dense cluster at the top of the stem, often nodding. Flowers yellow or pale purple, phyllaries with long multicellular hairs.

Habitat: Montane, subalpine, and tundra meadows.

Notes: Our highest elevation native thistle; common at high elevations throughout Colorado.

Cirsium undulatum (Nuttall) Sprengel

Plants similar to *C. ochrocentrum* but forming single stems rather than clumps. Heads with smaller flowers (corollas to <1 cm) and phyllaries with only weak spine tips and containing a glandular dorsal ridge. Flowers purplish to white.

Habitat: Plains, often in *Artemisia* communities.

Notes: Common at low elevations but not usually locally abundant. Look for the small heads.

Cirsium vulgare (Savi) Tenore

Plants biennial, stems to over 1 m, stems stout, with many spreading branches. Upper leaf surface with many sharp spines, lower surfaces wooly pubescent. Leaf bases decurrent node to node as in *Carduus*. Flower heads dark purple, large, to 3 cm tall, with noticeable cobwebby pubescence.

Habitat: Disturbed areas, pastures, and roadsides in the lower elevations montane meadows.

Notes: Adventive species, but not as aggressive or abundant as *Cirsium arvense*. It can be distinguished from Canada thistle by its larger flowers and spiny upper leaf surfaces with white hairs below.

Conyza "horseweed"

Conyza canadensis (L.) Cronquist

Syn. *Laennecia canadensis*

Plants annual, tall, up to almost 2 m but often beginning to flower when much shorter. Stems much branched at the top, with numerous narrowly lanceolate entire leaves, up to 10 cm long, but reduced in size towards the upper portion of stem. Lower heads numerous, very small, less than 5 mm in diameter and 3 mm high, crowded into terminal clusters. Ray flowers very short and hidden by the phyllaries.

Habitat: Roadsides, gardens, fields, plains through montane.

Notes: An abundant adventive species. Look for the numerous small heads with very indistinct rayflowers.

Conyza coulteri Gray

Syn. *Laennecia coulteri*

Plants annual, with oblanceolate, somewhat toothed leaves, reduced in size upwards, and with minute golden glands and wooly hairs. Ray flowers lacking, pappus white.

Habitat: Montane forests, disturbed areas in lower elevations.

Notes: Adventive species, not common in the Pikes Peak region. The habitats seem variable, ranging from dry soils south of the Arkansas River to montane forests.

Conyza schiedeana (Lessing) Cronquist

Syn. *Laennecia schiedeana*

Plants annual, with oblanceolate, somewhat toothed leaves, and minute glands and wooly hairs. Ray flowers present; otherwise similar to *C. coulteri*.

Habitat: Montane forests, lower elevations on the plains near the mountain front.

Notes: Adventive species, not common in the Pikes Peak region.

Coreopsis "golden tickseed"

Coreopsis tinctoria Nuttall

Plants often growing in patches, stems slender, erect, to 1 m. Leaves opposite, dark green, glossy, palmately divided into narrow segments. Ray flowers yellow with a reddish brown spot at the base; disk flowers also reddish.

Habitat: Plains wetlands, often around pond margins or roadsides.

Notes: Not yet documented as native in our region, but possibly occurring in the plains wetlands and playa basins. It is a popular component of prairie seed mixes and as a garden plant, and may become established

under the right ecological conditions. Ephemeral populations have been reported near developed areas. Look for the distinctive yellow and red spotted ray flowers and divided leaves.

Cosmos "cosmos"

The common garden cosmos (*Cosmos bipinnatifida*) is a taller version of this species, but the relationship is immediately obvious. Garden cosmos does not seem to have naturalized in this region, but *C. parviflora* has been found in several locations in the Black Forest and eastern El Paso County (as well as Custer County) and seems to be well established there. It has been suggested that *C. parviflorus* perhaps was established here by the Spanish some centuries ago, since it is more common in regions much to the south of us, including Texas, Arizona, and Mexico. It is an intriguing addition to our flora.

Cosmos parviflorus (Jacquin) Pers.

Plants annual, around 0.5 m; leaves opposite, divided to the midrib (pinnatifid) with narrow leaf segments. Ray flowers pink to purplish, less than 3 cm in diameter, usually ca. 1-2 cm.

Habitat: Meadows and pine forests, gravelly floodplains on the eastern plains; Black Forest Region.

Notes: Appears as a delicate, smaller version of the more showy garden cosmos. Look for the small flowers and narrowly divided leaves.

Crepis "hawk's beard"

The large, diverse, and unwieldy genus *Crepis* is often split by botanists into several different segregate genera under the names *Askellia* and *Psilochenia*. The sound-alike genus *Chlorocrepis* is treated here under the inclusive name *Hieracium*. Although diverse in growth and ecology, "*Crepis*" in its traditional sense shows medium sized heads of yellow ray flowers. *Crepis (Askellia) nana*, is a somewhat rare plant of high tundra scree slopes, not yet documented from Pikes Peak. Our other species resemble *Krigia* and *Hieracium*, and these should be carefully distinguished. Check for descriptive comments under those genera.

Crepis atribarba Heller

Syn. *Psilochenia atribarba*

Plants 15-70 cm, leaves pinnately lobed into segments; heads few to many, involucre about 1 cm tall, usually with hairs, flowers yellow.

Habitat: Dry montane forests.

Notes: Apparently somewhat uncommon in our area; thus far collected only in Teller County but probably present elsewhere.

Crepis nana Richardson

Syn. *Askellia nana*

Plants diminutive, somewhat sprawling, with succulent, ovate basal leaves on long petioles, margins entire to lyrate (fiddle-shaped) with a few broad teeth. Heads few, flowers yellow, involucre less than 1 cm in height.

Habitat: Scree and talus slopes, among boulders on the tundra, generally over 3,000 m.

Notes: Not yet documented in our area and generally rare or rarely collected in Colorado. If it occurs in our region, it would be scree slopes of the upper reaches of Pikes Peak where late snowbeds provide moisture.

Crepis runcinata James ex Torrey

Syn. *Psilochenia runcinata*

Plants up to 30 cm, with basal leaves that are divided to entire, variable in amount of hairs or sometimes entirely glabrous. Heads to 1.5 cm in height, flowers yellow, few to several in loose terminal clusters, phyllaries in a single row.

Habitat: Wet meadows, plains to the subalpine.

Notes: This common species is somewhat similar to the very rare *Krigia biflora* and shares a similar habitat in the Black Forest and high plains; however, *Krigia* has a distinctive large bract below the inflorescence, and very different phyllaries in two distinct rows. *Crepis runcinata* has deeply divided leaves and lack the prominent bract below the inflorescence.

Cyclachaena "giant sumpweed"

Cyclachaena xanthifolia Fresen.

Syn. *Iva xanthifolia*

Plants annual, tall, often to 2 m or more. Leaves opposite or upper alternate, with long petioles. Leaf blades ovate, to 30 cm long and resembling those of cockleburs in shape; veins prominent, margins toothed. Inflorescence in dense crowded spikes in upper leaf axils and stem apex; flowers minute, greenish white.

Habitat: Damp areas such as stream banks or gravels, or around road culverts, moist disturbed areas.

Notes: Native, but somewhat weedy in growth and habitat. The leaves resemble a giant cocklebur, though there are no spiny burs. The plants are often extremely tall, earning the common name of "giant sumpweed", and can resemble giant ragweed, *Ambrosia trifida*, but lacks that species divided leaves.

Dugaldia "sneezeweed": SEE *HELENIUM*

Dyssodia "fetid marigold"

Both of our species have a strong rank odor that reminds one of an intense marigold. Walking or driving over them releases the odor. *Dyssodia papposa* is extremely common and weedy species here; *D. aurea* is considerably more common in southeastern Colorado than it is here. The two species can be distinguished by the size of the flowers and whether the leaves are spiny tipped or not.

Dyssodia aurea (A. Gray) A. Nelson

Syn. *Thymophylla aurea*

Plants low, about 10 cm, with conspicuous ray flowers up to 4 mm long. Pappus scales lacking bristles, leaf-divisions lacking spiny tips.

Habitat: Sandy or gravelly soils on the plains.

Notes: This species was formerly abundant in the gravelly soils and low mesas of southern El Paso County, but a number of populations there have been destroyed by development south of Fountain. It probably still occurs in Pueblo and possibly Fremont County, as the species is abundant in the region to our south. Look for the conspicuous ray flowers.

Dyssodia papposa (Ventenat) A. S. Hitchcock

Plants low, about 10 cm, with minute ray flowers. Pappus scales with bristles, leaf divisions with spiny tips.

Habitat: Sandy and gravelly areas on the plains, especially in disturbed areas along roads and trails.

Notes: Extremely common throughout our region, and blooming in late summer. The strong spicy smell is distinctive and distasteful to some.

Echinacea "coneflower"

The familiar garden coneflower, well known as a medicinal plant, has a close native relative that at least formerly occurred in our region on the plains. As the plains have become drier, however, and overcollecting has occurred to extirpate native populations, this species may have become extinct in Colorado. It has not been found in recent decades in the Pikes Peak region. Since this is a popular garden plant, horticultural varieties may escape, but their longterm persistence is unlikely.

Echinacea angustifolia DeCandolle

Plants up to about 0.5 m, stems pubescent below; leaves narrow, basal leaves with petioles, upper leaves with petioles short or lacking; heads up to 3 cm in diameter, ray flowers purple, somewhat drooping; receptacle conical and very prominent.

Habitat: Known previously from moist meadows on the plains.

Notes: Known only from a few historical records, and probably now extinct in our area.

Engelmannia "Engelmann daisy"

This genus occurs commonly in the midwestern prairies, and in regions to our south. It looks like a shorter *Silphium* with its deeply incised (lacinate) leaves (in our species), and broad yellow ray flowers. Its occurrence here as a native is uncertain; it grows along roadsides in the Colorado Springs area and may have been introduced via a seed mix or from a xeriscape garden.

Engelmannia pinnatifida A. Gray

Syn. *Engelmannia peristenia*

Plants perennial, stems to about 0.5 m, leaves alternate, pinnate, to about 15 cm long. Heads about 3 cm in diam., ray flowers bright yellow.

Habitat: Roadsides, dry prairie.

Notes: Blooms in June, one of the early yellow composites. Its native status here is not certain. Look for the stout plants with deeply incised leaves and yellow sunflower-like heads.

***Erigeron* "daisy"**

The true daisy belongs to the genus *Erigeron*, and can usually be distinguished from asters by the uniform row(s) of straight phyllaries, and the typically less leafy stem. However, not all species are easily distinguished this way without experience with the genus, so it is always best to try the alternative genus if any plant does not seem to fit. Some botanists split daisies into segregate genera *Trimorpha*, *Stenactis* and *Eucephalus*, which are included here under *Erigeron*. Because the genus is so diverse in our region, several groups are separated out here by ecological zone when they are restricted to that zone in question. Otherwise, the species can be somewhat broadly distributed over the elevational gradient listed.

LOWER ELEVATION SPECIES (PLAINS THROUGH LOWER MONTANE)

See also *E. lonchophyllus* under "Trimorpha" Group

Erigeron bellidiastrum Nuttall

Plants with many ascending branches, usually about 20 cm; stem hairs ascending and curved inward, pappus of a single row of bristles. Heads less than 1 cm in height, ray flowers white.

Habitat: Sandy soils on the plains.

Notes: Common in the sandy areas, especially Chico Basin and eastern El Paso County. See notes under *E. divergens* for lookalike species.

Erigeron colo-mexicanus A. Nelson

Syn. *Erigeron traceyi*

Plants with small solitary heads on leafless stems from basal rosettes; developing stoloniferous shoots. Stems with spreading hairs.

Habitat: Gravelly floodplains and meadows on the plains, mesas, and lower foothills.

Notes: Very similar to *E. flagellaris* but with spreading stem hairs instead of appressed ones. Both these species have stolons, so check the hairs (use a lens). See notes under *E. divergens*.

Erigeron compositus Pursh

Plants forming low clumps, ca 5 cm including flowering stalks; leaves 3-lobed, grayish green; heads solitary, ray flowers usually white but occasionally lavender.

Habitat: Gravelly areas from the plains to the alpine. Common on old railroad beds near Falcon, and on higher elevation gravelly slopes.

Notes: Common species, somewhat resembling *E. pinnatisectus* with which it grows in the higher elevations, but having only 3 lobes on the leaf tips.

Erigeron divergens Torrey & Gray

Plants with stems multiple, erect, and strongly pubescent, to 20 cm, or more, containing numerous small heads with white to pinkish ray flowers. Stolons lacking.

Habitat: Disturbed sites, including roadsides and floodplains.

Notes: The "divergens" group of species includes *E. divergens*, *E. colo-mexicanus*, *E. flagellaris*, *E. strigosus*, and *E. bellidiastrum*. They are quite similar in appearance and habitat, but differ in whether or not they have stolons (*E. flagellaris* and *E. colo-mexicanus*), or whether the stems are single. Check hairs and stem characteristics carefully!

Erigeron flagellaris A. Gray

Plants with small solitary heads on leafless stems from basal rosettes and developing stoloniferous shoots. Stems with appressed hairs.

Habitat: Gravelly floodplains and meadows on the plains, mesas, and lower foothills.

Notes: Very similar to *E. colo-mexicanus* but with appressed stem hairs instead of spreading ones. See also notes under *E. divergens*.

Erigeron pumilus Nuttall

Plants dwarf, usually less than 10 cm, forming a dense clump with many caudices (lower stem bases), stem and leaves with spreading hairs, sometimes glandular. Heads less than 1 cm in height and diameter, rays white, rosy, or purple.

Habitat: Dry plains.

Notes: Common early blooming species. Look for the short growth in a dense clump.

Erigeron strigosus Muhlenberg

Syn. *Stenactis strigosus*

Plants annual or biennial, 30-70 cm, stems finely strigose (with long hairs) or rarely glabrous (lacking hairs). Basal leaves oblanceolate to elliptic, stem leaves relatively few, reduced in size above, linear to oblanceolate. Heads several to many in a flat-topped inflorescence; involucre small, 3-5 mm, ray flowers up to ca. 6 mm, white or pink to lavender. Pappus double, at least on the ray flowers.

Habitat: Disturbed areas, sandy or gravelly soils, lower to middle elevations.

Notes: This species is often placed in *Stenactis* based on its unusual double pappus, where an inner row of fragile bristles (they break off easily) contrast with an outer row of short scales. See notes under *E. divergens*. The strigose (straight, stiff, and appressed) hairs are helpful in this species.

Erigeron vetensis Rydberg

Plants dwarfed and somewhat clumped, with entire linear-lanceolate basal leaves <5 mm wide; leaves and stem usually glandular. Ray flowers pinkish or lighter in color.

Habitat: Gravelly slopes, occasionally on the high plains on sandstone outcrops, through the foothills.

Notes: Common, plants blooming early in the summer. Somewhat similar to *E. pumilus* but generally more on rocky gravelly slopes rather than on finer grassland soils.

Erigeron vreelandii Rydberg

Plants to about 0.5 m. Stems leafy, leaves glandular or glandular-scabrous.

Habitat: Canyons, rocky forested slopes.

Notes: Uncommon in El Paso County, more common to the south, to be expected in Fremont Co. Look for the taller leafy stems, and glandular leaves.

MIDDLE TO HIGH ELEVATION SPECIES

(see also *E. vreelandii* under lower elevation species)

Erigeron compositus Pursh

Plants forming low clumps; leaves 3-lobed, grayish green; heads solitary, ray flowers usually white but occasionally lavender.

Habitat: Gravelly areas from the plains to the alpine. Common on old railroad beds and creek floodplains near Peyton and on higher elevation gravelly slopes.

Notes: Common species, somewhat resembling *E. pinnatisectus* with which it grows in the higher elevations, but having only 3 lobes on the leaf tips.

Erigeron elatior (A. Gray) Greene

Plants up to about 0.5 m, stems leafy with broad leaves not much reduced in size upward; heads relatively large and few, with purple ray flowers. Phyllaries woolly hairy with pinkish multicellular hairs (use a lens).

Habitat: Aspen groves, subalpine meadows and forests.

Notes: A common and beautiful species. Look for the leafy stems where the leaves are mostly all relatively large, and the few large heads.

Erigeron eximius Greene

Plants up to about 0.5 m, stems uniformly leafy, heads relatively large and few, with purple ray flowers. Phyllaries hairy but not woolly villous and lacking pinkish color. Pappus of long and short bristles.

Habitat: Aspen groves, subalpine meadows and forests.

Notes: Very similar to the more common *E. peregrinus* but differing in having a double rather than single pappus (use a lens), and in having rhizomes leading to leafy shoots.

Erigeron formosissimus Greene

Plants up to about 0.5 m, stems curved at the base, leafy but with stem leaves much reduced in size, heads relatively large with purple ray flowers. Phyllaries glandular-sticky and often hairy.

Habitat: Meadows, upper montane zone through the subalpine.

Notes: The curving stem and glandular phyllaries is quite distinctive on this species.

Erigeron glabellus Nuttall

Plants up to about 0.5 m, stems leafy, though leaves somewhat reduced in size upward. Leaves usually pubescent on both surfaces, but sometimes glabrous (lacking hairs), phyllaries not glandular (use a lens). Heads usually several per stem.

Habitat: Wet meadows, montane and subalpine meadows, higher elevations on the plains.

Notes: Differs from *E. subtrinervis* in having appressed hairs and lacking glands on the phyllaries.

Erigeron grandiflorus Hooker

Plants low, under 10 cm including flowering stalks, with entire leaves, involucre (phyllaries) woolly villous with long hairs having crosswalls visible under a microscope or lens, involucre and upper stem with shaggy hairs. Heads relatively large, ray flowers purple.

Habitat: Tundra meadows.

Notes: Pikes Peak, uncommon. Similar to the very common *E. simplex* but differing in the shaggy hairs on the phyllaries.

Erigeron leiomerus Gray

Plants loosely clumped, with entire, oblanceolate, glabrous (lacking hairs) leaves; involucre not woolly villous but often glandular; heads with purple ray flowers.

Habitat: Scree and talus slopes at high elevations on Pikes Peak.

Notes: The habitat and clumped appearance of this species is quite distinct from other alpine species.

Erigeron peregrinus (Banks) Greene

Plants up to about 0.5 m, stems leafy, heads relatively large and few, with purple ray flowers. Phyllaries hairy with red-tipped glands, upper stems with white multicellular hairs and glands.

Habitat: Subalpine meadows and tundra slopes.

Notes: Very similar to *E. eximius*, but differing in having a single pappus, and lacking rhizomes. The red-tipped glands are also very distinctive on this species.

Erigeron pinnatisectus (A. Gray) A. Nelson

Plants clumped, with pinnately divided (to the midvein), somewhat hairy leaves. Stems less than 3 cm, with relatively large heads up to 3 cm in diameter; ray flowers purple.

Habitat: Tundra meadows, Pikes Peak.

Notes: A common species, the only one in our region with pinnatisect leaves. Be careful about confusing it with *E. compositus*, which has 3-lobed leaves (only tips are lobed) and can also occur at high elevations.

Erigeron simplex Greene

Plants in small clumps or solitary, leaves entire, somewhat hairy. Stems less than 10 cm, usually about 5 cm or less, with relatively large heads; ray flowers purple. Involucres densely hairy but not glandular.

Habitat: Tundra meadows, Pikes Peak.

Notes: Similar to, but much more common than *E. grandiflorus* and distinguished by the lack of shaggy hairs on the involucre.

Erigeron speciosus (Lindley) de Candolle

Plants up to about 0.5 m, stems leafy with upper leaves +/- the same size as the lower leaves; leaves hairy on margins and veins. Phyllaries sometimes glandular; ray flowers purple.

Habitat: Meadows, aspen groves, and upper elevation conifer forests.

Notes: Very similar to *E. subtrinervis*, but with less visible veins and less pubescence on the leaves. Both species are common.

Erigeron subtrinervis Rydberg

Plants up to about 0.5 m, stems leafy with upper leaves +/- the same size as the lower leaves; leaves hairy on both surfaces with 3 prominent veins. Phyllaries sometimes glandular; ray flowers purple.

Habitat: Meadows and conifer forests, foothills to subalpine.

Notes: Very similar to *E. speciosus*, but with 3 prominent leaf veins and more pubescence on the leaves.

"TRIMORPHA-TYPES": HEADS WITH VERY SHORT RAY FLOWERS (PLAINS TO UPPER ELEVATIONS)

Erigeron acris L.

Syn. *Trimorpha elongata*, *Erigeron elongata*

Plants to ca 30 cm, very narrow stem leaves, heads with extremely short (<2 mm) pinkish ray flowers, and appearing as if in bud. Pappus reddish. Leaves and stem glandular.

Habitat: Moist subalpine meadows.

Notes: See *E. lonchophyllus*. Look for glands on the stem and leaves, and the color of the pappus.

Erigeron lonchophyllus Hooker

Syn. *Trimorpha lonchophylla*

Plants to ca 30 cm, very narrow stem leaves, heads with extremely short (<2 mm) pinkish ray flowers, and appearing as if in bud. Pappus white. Leaves and stem without glands.

Habitat: Rocky high elevation meadows; moist benches and swales in the Black Forest and Peyton area.

Notes: The two "*Trimorpha*" species in our region have very distinctive heads with extremely short ray flowers. They differ in habitat, color of the pappus, and whether or not the stem and leaves are glandular.

***Eupatorium* "Joe pyeweed, thoroughwort"**

Eupatorium maculatum L.

Syn. *Eutrachium maculatum*

Plants up to or over 1 m, somewhat bushy, with purple spotted stems and with broad, serrate (sharply toothed), opposite or whorled (occurring in a circle around the stem) leaves lacking petioles. Heads with disk flowers only, purplish to whitish.

Habitat: Wet areas, streamsides, known from the Black Forest and the lower foothills of Pikes Peak.

Notes: A rare, large, and unmistakable species with its whorled leaves (some appear opposite). Although native, some populations that occur near old cabins may be garden escapees that have persisted since this species was often planted for medicinal purposes. It is a common eastern garden plant.

***Euthamia* "western goldenrod"**

This genus, common in the Midwest, strongly resembles the true goldenrods (*Solidago*), but differs in having narrowly linear leaves and a flat-topped inflorescence.

Euthamia occidentalis Nuttall

Syn. *Solidago occidentalis*

Plants perennial, to about 1 m. Stems slender, glabrous. Leaves narrowly linear, to about 8 cm long, bases clasping the stem, with 3 prominent veins. Heads small, ray and disk flowers bright yellow, heads numerous and forming an elongate, interrupted inflorescence.

Habitat: Moist sites, drainages, plains and lower foothills.

Notes: Uncommon in our region. *Solidago gigantea* can also occur in wetlands, but lacks the flat topped inflorescence.

***Evax* "rabbit tobacco"**

Evax prolifera Nuttall

Plants annual, small, usually less than 15 cm. Stems broadly branching, leaves, when present (often absent), spatulate (like a spatula), woolly hairy (tomentose). Heads in tight woolly clusters at stem ends.

Habitat: Plains, often in over-grazed areas.

Notes: This species looks like a leafless *Gnaphalium*. Look for the branching stems and tight flower clusters at the tips.

***Flaveria* "yellowtops"**

Flaveria campestris J. R. Johnston

Plants annual; stems leafy, to ca. 0.5 m. Leaves opposite, narrow, sessile, to about 6 cm long. Heads in small leafy clusters at the ends of the stems. Involucres cylindrical, ca 5 mm high, ray flowers few, yellowish, very short and inconspicuous, ca. 2 mm.

Habitat: Lower elevations, alkaline soil on the plains.

Notes: An odd plant with inconspicuous ray flowers; uncommon or undercollected here.

***Gaillardia* "blanket flower"**

Gaillardia aristata Pursh

Plants perennial, stems to 0.5 m. Leaves 5-20 cm, linear to lanceolate, entire to coarsely lobed but not divide to the midvein (pinnatifid). Heads to 5 cm in diameter, ray flowers yellow with maroon bases, tips usually lobed.

Habitat: Plains, roadsides, lower foothills.

Notes: A very distinctive and beautiful species of mid to late summer. The blooming time and leaf morphology distinguish it from *G. pinnatifida*. Blanket flower is commonly planted along roadsides, and is naturalized from gardens and seed mixes. Look for the dramatic colors and lobed tips of ray flowers.

Gaillardia pinnatifida Torrey

Plants perennial, stems to 0.5 m. Leaves basal or on lower part of stem, to 8 cm, pinnatifid. Heads to 3 cm in diameter, ray flowers yellow with maroon

Notes: This species is most common in southern El Paso County through Pueblo County; it blooms earlier in the summer than *G. aristata*.

***Galinsoga* "quickweed"**

Galinsoga parviflora Cavanilles

Plants annual, stems about 0.5 m. Leaves opposite, serrate (sharply toothed). Involucres <5 mm in height, ray flowers white, very short, <2mm. Phyllaries with scarious (translucent) margins.

Habitat: Gardens, disturbed soil along roadsides and trails.

Notes: A common but not problematic weed, blooming late summer. Look for the short white ray flowers. Another species, *G. quadriradiata*, has been recognized in Colorado and may occur here. Its phyllaries have herbaceous rather than scarious margins.

***Gnaphalium* "cudweed"**

Gnaphalium resembles *Antennaria* in having wooly white heads, but lack the basal leaf mats. The flower heads appear to be imbedded in a ball of fuzzy white wool. They are all annuals, and prefer disturbed ground with little competition; both our species are native. See also the genus *Pseudognaphalium*.

Gnaphalium palustre Nuttall

Plants wooly white pubescent throughout; stems up to 20 cm, often forming spreading patches; leaves alternate, entire, and somewhat oblong. Heads small, imbedded in leaf axils and at the ends of branches, subtending leaves about as long as the heads, phyllaries pale in color.

Habitat: Moist sites that are drying out such as ephemeral ponds, typically from the foothills to the montane, but occasionally lower.

Notes: Look for the pale phyllaries with short-leafed bracts below the heads.

Gnaphalium uliginosum L.

Plants white pubescent throughout with appressed hairs; stems to about 25 cm, sometimes spreading. Leaves alternate, entire, generally around 3 mm wide or less. Heads small, in the leaf axils and at the ends of the branches, subtending leaves much longer than the heads, phyllaries dark.

Habitat: Moist sites that are drying out, generally from the foothills to the montane, occasionally lower.

Notes: Look for the dark phyllaries with long-leafed bracts below the heads.

Grindelia "gumweed"

As a group, the gumweeds are unmistakable, a sign of late summer with bright yellow round heads, recurved, sticky-gummy phyllaries and leathery leaves. It can be somewhat difficult to determine the species: critical features include whether or not ray flowers are present, whether basal leaves are present, and how the stem leaves clasp the stem. Not all botanists agree on the species, which may hybridize in some cases. Our most common species, abundant in disturbed areas and roadsides throughout our region, is *G. squarrosa*. All our species are ca. 0.5 m tall. Early flowering heads may not show clear ray flowers, as these develop more prominently later in flower, so look carefully.

Grindelia aphanactis Rydberg

Syn. *Grindelia nuda* var. *aphanactis*

Plants lacking ray flowers, phyllaries not strongly resinous. Leaves narrow at the base and not strongly clasping the stem, serrulate on the margins, apex acute.

Habitat: Roadsides, gravelly areas.

Notes: Most common in Custer County, but occurring also in the Pueblo and Fremont county regions, although somewhat uncommon there. Caution: the other species with ray flowers, may resemble this when the heads are young, and the ray flowers are barely discernable. Look closely.

Grindelia decumbens Greene

Plants with ray flowers, phyllaries only slightly resinous if at all. Basal leaves present at flowering time.

Habitat: Roadsides, gravelly areas.

Notes: More abundant south of our region, but occasional in the vicinity of the Wet Mts. Some botanists include *G. decumbens* into a broad concept of *G. squarrosa*.

Grindelia inornata Greene

Plants lacking ray flowers, phyllaries strongly resinous. Leaves sharply dentate on the margins, apex acute, sessile (lacking petioles) and clasping the stem.

Habitat: Barrens, mesas, roadsides, and shale outcrops.

Notes: Thus far known only from Pueblo and Fremont Counties, where it is locally abundant. Caution: the other species with ray flowers may resemble this when the heads are young, and the ray flowers are barely discernable. Look closely.

Grindelia revoluta Steyermark

Plants with ray flowers, plants perennial with basal leaves present at flowering time. Phyllaries strongly resinous.

Habitat: Plains grasslands.

Notes: Uncommon or undercollected; if basal leaves are not included, this species strongly resembles *G. squarrosa*, and misidentifications may occur. Some botanists include *G. revoluta* into a broad concept of *G. squarrosa*.

Grindelia squarrosa (Pursh) Dunal

Plants with ray flowers, plants annual or biennial, lacking basal leaves at flowering time. Phyllaries strongly resinous. Stem leaves oblong, lacking petioles and clearly clasping the stem.

Habitat: Grasslands, mesas, roadsides, often in disturbed areas.

Notes: An abundant species; be careful with identification since occasional rayless heads can occur, and immature heads may appear to lack rays. Check several heads on several plants, and determine if basal leaves are present or not. Check the leaf bases to distinguish this species from *G. subalpina*. See also *G. revoluta* and *G. decumbens*.

Grindelia subalpina Greene

Plants with ray flowers, plants annual or biennial, lacking basal leaves at flowering time. Phyllaries strongly resinous. Stem leaves oblanceolate, narrowed at the base and not clasping the stem.

Habitat: Foothills to subalpine, often in dry grasslands.

Notes: Easily confused with *G. squarrosa*, but generally occurring at higher elevations than that species, and with different leaf morphology. Look at the leaf bases.

***Gutierrezia* "snakeweed"**

Gutierrezia sarothrae (Pursh) Britton & Rusby

Plants bushy, less than 0.5 m perennial, usually woody at the base, somewhat resinous in the inflorescence. Stems leafy, with linear lanceolate leaves. Heads small, numerous, with layered phyllaries. Ray flowers yellow, few.

Habitat: Grasslands, low elevations.

Notes: Snakeweed is an abundant component of the lowland grasslands, often occurring where overgrazing or disturbance has disturbed the cover. It resembles a smaller, more delicate *Chrysothamnus*. Look for the few, small flowers

***Helenium* "sneezeweed"**

THE GENUS DUGALDIA IS PLACED INTO HELENIUM IN THIS TREATMENT

Helenium autumnale L.

Plants up to about 1 m, often growing in clumps. Stems leafy, leaves alternate, entire or toothed. Phyllaries linear, subulate (awl-shaped, with a pointed tip) spreading or becoming reflexed. Ray flowers bright yellow, ca 1 cm long, toothed at the apex, held horizontally (not drooping).

Habitat: Moist meadows, montane elevations and Black Forest region.

Notes: This is a beautiful species, with multiple flower heads. The short ray flowers have a "chopped off" appearance and do not droop.

Helenium hoopesii A. Gray

Dugaldia hoopesii; *Hymenoxys hoopesii*

Plants often over 1 tall, with a stout, leafy stem. Heads large, over 4 cm in diameter, with yellow orange ray flowers that typically droop.

Habitat: Moist montane and subalpine meadows and aspen groves; wet seep areas and meadows on the higher elevations of the plains.

Notes: A beautiful and common element in wet meadows, more common in the montane than on the plains. The common name refers to its pollen and the effect it can have on those inclined towards hay fever.

***Helianthella* "little sunflower"**

The sunflowers (*Helianthus*) and sunflower-mimics (*Helianthella*, *Heliomeris*, *Heliopsis*) are many and abundant in the late summer landscape. To tell the genera apart, look carefully at the pappus characteristics and the achenes when mature. *Helianthella* and *Helianthus* are easy to confuse, so check both genera.

Helianthella parryi A. Gray

Plants relatively low and slender, less than 1 m. Heads usually less than 2 cm in diameter; leaves not leathery, less than 10 cm long.

Habitat: Forests of the montane zone, usually with ponderosa pine or aspen.

Notes: A generally diminutive species.

Helianthella quinquenervis (Hooker) Gray

Plants tall and relatively stout, over 1 m. Heads up to 5 cm in diameter; leaves leathery, ovate-lanceolate, with 5 prominent veins; 20-50 cm long.

Habitat: Montane zone, usually under aspens.

Notes: Easily distinguished by its larger size and the veins of the leaves.

***Helianthus* "sunflower"**

Sunflowers are a cheerful sight on the late summer landscape, but can be difficult to identify to species since some species can hybridize, and they often resemble other genera (see *Helianthella* and *Heliomeris*).

Helianthus annuus L.

Plants annual, often up to 2-3 m, branched, stems stout. Leaves roughly scabrous (scratchy to touch), alternate, up to 20 cm long, somewhat ovate. Heads large, ray flowers up to 4 cm long but sometimes smaller. Pappus of 2 narrow scales. Phyllaries hispid ciliate (stiff hairs on the margins).

Habitat: Grasslands, roadsides, generally at lower elevations.

Notes: Abundant and variable, probably hybridizing with *H. petiolaris*, and often a sign of disturbance or overgrazing.

Helianthus nuttallii Torrey & Gray

Plants perennial, stems somewhat slender, up to 1 m. Leaves alternate or opposite, 1.3-3 cm wide, lanceolate, toothed or entire. Ray flowers 2-3 cm long.

Habitat: Moist areas, lowlands to montane.

Notes: A distinctive species with narrow leaves, and one of the few large yellow-flowered composites growing in wetlands. Be careful not to confuse it with *Bidens*, another tall, wetland composite! Look for nodding heads in *Bidens cernua* and the horn-like awns. *Helianthus* heads do not nod and the achenes lack the sharp awns.

Helianthus petiolaris Nuttall

Plants annual, stems stout, to about 1 m. Leaves scabrous, variable in shape from narrowly lanceolate to ovate. Heads large, ray flowers to about 2 cm long. Phyllaries not hispid ciliate.

Habitat: Grasslands, roadsides, at lower lower elevations.

Notes: Abundant and variable, easily confused with *H. annuus*, with which it apparently hybridizes. The phyllaries are not hairy-ciliate in this species as they are in *H. annuus*.

Helianthus pumilus Nuttall

Plants perennial, stems stiffly hairy, relatively low and bushy branching from the base, less than 1 m. Leaves mostly opposite, ovate.

Habitat: Mesas, lower foothills.

Notes: This species has a distinctive growth habit, with the low, bushy branched appearance unlike other sunflowers that typically grow as upright stems.

Helianthus rigidus (Cassini) Desfontaines

Plants perennial, stems stout, up to 1 m. Leaves mostly opposite, highly variable in shape but typically somewhat rhomboidal and reduced in size on the upper portion of stem. Phyllaries in several series, disk flowers usually reddish, sometimes yellow.

Habitat: Mesas, lower foothills.

Notes: The reddish color of the disk flowers is distinctive.

Helianthus tuberosus L.

Plants tall, over several m, stems slender, scabrous. Leaves variable, mostly opposite. Heads many, relatively small, ray flowers up to 3 cm long.

Habitat: Near cultivated areas, Arkansas River Valley.

Notes: This is the cultivated Jerusalem artichoke, with edible starchy tubers on the roots. It can proliferate in old fields and gardens, and occurs in the cultivated zone along the Arkansas as an adventive species.

The adventive species *Helianthus ciliaris* (Texas blueweed) has also been reported to occur near here. This species is rhizomatous, has blue-green color in the leaves that have ciliate margins.

***Heliomeris* "goldeneye"**

Heliomeris multiflora Nuttall

Syn. *Viguiera multiflora*

Plants up to 1 m, much branched above. Heads numerous, relatively small, with ray flowers up to ca 2 cm long. Leaves opposite, narrowly elliptic.

Habitat: Montane meadows, foothills.

Notes: This genus is similar to *Helianthus*, the true sunflower, but differs in the more conical receptacle. It looks like a small-headed sunflower. The many flowers and opposite elliptic leaves are diagnostic.

***Heliopsis* "oxeye, false sunflower"**

This genus is one of the sunflower lookalikes, but differs in having ray flowers that persist, becoming papery in age.

Heliopsis helianthoides (L.) Sweet

Plants up to 1 m, stems and leaves scabrous (roughly scratchy), leaves opposite, 5-10 cm long, cordate (heart-shaped) at the base, margins serrate. Heads on long stems, ray flowers conspicuous, to 3 cm long, persistent and papery in age.

Habitat: Prairie grasslands, disturbed slopes in the montane zone.

Notes: A midwest prairie species now uncommon or in our region. The opposite scabrous leaves and persistent ray flowers are a useful way of distinguishing this from true sunflowers.

***Heterotheca* "golden aster"**

Heterotheca species are typically low, somewhat scrubby looking yellow composites, resembling short sunflowers more than the aster or daisy grup. They are always yellow, and often grow in open or disturbed soil; all of our species are common.

Heterotheca canescens (de Candolle) Shinnery

Plants usually about 30 cm or less, stems unbranched, heads several, leaves less than 3 cm, with dense, appressed pubescence, appearing grayish; leaves numerous, alternate, heads relatively small,

Habitat: Low elevations, plains grasslands.

Notes: Look for the single unbranched stem, small heads, and gray-green appearance.

Heterotheca fulcrata (Greene) Shinnery

Syn. *Heterotheca foliolosa*

Plants 30 cm or more, often branched, heads several, leaves over 3 cm long, oblong-lanceolate, heads larger than in *H. canescens*, with leaves and bracts densely clustered below the inflorescence.

Habitat: Plains, mesas, lower foothills.

Notes: An extremely common species, often in disturbed or overgrazed ground or along roadsides. Look for the leaf clusters below the heads.

Heterotheca villosa (Pursh) Shinnery

Plants to 30 cm, loosely branched, heads several, leaves coarsely hairy, ciliate and glandular, appearing green.

Habitat: Foothills, canyons and rocky slopes, through the lower montane.

Notes: An abundant and highly variable species. Look for the greener color and glandular hairs.

Heterotheca pumila, subalpine rockslide species found in other parts of the Front Range, has not yet been collected in our region but may well be present here. It can be distinguished by its single head with longer ray flowers. It grows at higher elevations than any other species of *Heterotheca*.

***Hieracium* "hawkweed"**

Hieracium albiflorum Hooker

Syn. *Chlorocrepis albiflora*

Plants up to about 0.5 m, with basal leaves but few stem leaves. Basal leaves with petioles, blades oblong, hairy with tawny hairs. Heads numerous, flowers white to creamy, phyllaries appearing dark in center.

Habitat: Dry areas in conifer forests in the foothills and montane.

Notes: Look for the white flowers on this species and the dark midvein on the phyllaries. It appears to be uncommon in our area. See *H. fendleri*, which it resembles strongly.

Hieracium aurantiacum L.

Plants 20-30 cm, basal leaves somewhat club-shaped and covered with stiff hairs, margins entire. Heads few to many, in terminal clusters; flowers bright orange; phyllaries with black hairs.

Habitat: Garden weed, naturalized in the foothills especially west of Palmer Lake.

Notes: This is a species well known to gardeners, but apparently becoming more common in the foothills where it is spreading rapidly and considered a noxious weed. The orange-colored flowers are very distinctive.

Hieracium fendleri Schultz-Bipontinus

Syn. *Chlorocrepis fendleri*

Plants 20-50 cm tall, basal leaves hairy, with few stem leaves. Heads relatively few, in panicles, flowers yellow, phyllaries appearing green.

Habitat: Forests and meadows in the montane to subalpine zone.

Notes: Similar to *H. albiflora*, but distinguished by its yellow flowers and green phyllaries. The two species are quite similar; check phyllaries and leaf hairs. *Krigia* has larger flowers, a prominent bract below, and glabrous leaves.

Hieracium triste has been reported from our region but not documented. It has non-hairy leaves, yellow flowers, and phyllaries that are black dotted and glandular (use a lens). It would occur in the upper montane and subalpine meadows or forests.

***Hymenopappus* "hymenopappus"**

Hymenopappus filifolius Hooker

Plants perennial with a basal rosette of pinnatisect (divided to the midrib) leaves and multiple caudices (lower stem bases). Stems tall with reduced or absent leaves, sometimes with wooly hairs in the leaf axils. Heads few, ray flowers lacking, disk flowers bright yellow.

Habitat: Lowlands, in grasslands and pinon pine-juniper communities.

Notes: Common throughout our region, and distinguished by the multiple caudices and color of the disk flowers.

Hymenopappus newberryi (A. Gray) I. M. Johnston

Plants tall, with basal rosette of pinnatisect leaves. Heads relatively large, with prominent white ray flowers.

Habitat: Dry hillsides in the lowlands, especially Pueblo and Fremont Counties.

Notes: Uncommon here, where it is on the northern edge of its range. Look for the presence of ray flowers.

Hymenopappus tenuifolius Pursh

Plants biennial, with a basal rosette of pinnatisect leaves and only single (rarely more) caudices (stem bases at or just below ground surface). Stems tall with reduced leaves if any. Heads few, ray flowers lacking, disk flowers cream colored.

Habitat: Dry grasslands on the plains, especially in sandy soils of southern El Paso and Pueblo Counties.

Notes: Look for the creamy disk flowers and lack of ray flowers.

***Iva* " sumpweed"**

Iva axillaris Pursh

Plants perennial, to 40 cm. Stems erect, much branched; leaves numerous, opposite, sessile (lacking petioles), narrowly oblong and scabrous (scratchy) to the touch. Heads with disk flowers only, occurring in the leaf axils.

Habitat: Disturbed ground, often in pastures, railroad gravels or cropland; salt tolerant.

Notes: A native species, but appearing weedy in growth and ecology. Look for the opposite oblong leaves lacking petioles.

***Krigia* "dwarf dandelion"**

Krigia biflora (Walter) S. F. Blake

Plants up to 0.5 m (hardly dwarf!) and resembling a dandelion or hawkweed with few, relatively large yellow heads and slightly denticulate (with minute teeth) to almost entire basal leaves. Heads subtended by a distinctive large bract; the double pappus consisting of small outer scales and inner capillary bristles, is also distinctive (use a lens).

Habitat: Moist meadows in the Black Forest.

Notes: Very rare, and increasingly losing habitat to wetland drainage, development, and weed incursions. Known only from a few sites in the Black Forest; one of the species that comprises the relictual eastern element of our flora. Look for the large bract below the head.

***Lactuca* "wild lettuce"**

Lactuca biennis (Moench) Fernald

Plants biennial, with a basal rosette of broad, triangular, pinnatifid (divided to the midrib) leaves; stem tall, to over 1 m. Flowers blue or purplish in color, pappus brownish.

Habitat: Foothills and montane, moist areas.

Notes: Apparently uncommon in our area. Look for the bluish flowers and tall stem with pinnatifid leaves.

Lactuca canadensis L.

Plants biennial or annual, with a tall glabrous stem to ca. 1 m. Leaves sinuate (wavy)-pinnatifid (divided to the midrib), lacking spines. Flowers yellow, pappus white.

Habitat: Canyons in the lower foothills, in moist areas.

Notes: Uncommon species here. Look for the yellow flowers and non-spiny leaves.

Lactuca serriola L.

Plants biennial or annual, with a tall stem up to 2 m. Leaves bluish green, deeply lobed with the lobes pointing backwards and clasping the stem. Margins sharply toothed to prickly, and often midveins spiny as well. Flowers yellow.

Habitat: Fields and gardens, disturbed meadows, usually in somewhat moist soil.

Notes: Adventive, very common throughout our region. *Lactuca serriola* is very similar to *Sonchus*, which also has yellow flowers, and clasping spiny leaves. *Lactuca* can be distinguished by its narrowly cylindrical involucre below the heads; *Sonchus* has a broad more rounded involucre.

Lactuca tatarica (L.) C. A. Meyer

Plants perennial, up to 1 m. Leaves linear to lanceolate, exhibiting a great diversity in degree of toothing, lacking spines. Flowers blue, pappus white.

Habitat: Meadows, roadsides, usually in dry areas.

Notes: A native species, that is abundant especially in the Black Forest meadows. It differs from *L. biennis* in the shorter stem and the preference for dry habitats.

Lactuca ludoviciana (Nutt.) Ridd, a biennial of the Great Plains up to 2 m tall, is possibly also in our region, though probably sporadic at best. Stems are glabrous (lacking hairs), the flowers blue, and the highly variable leaves have a clasping base.

***Leucanthemum* "ox-eye daisy"**

Leucanthemum vulgare Lamarck

Plants rhizomatous, tall and somewhat leafy stemmed, to ca 1 m. Heads relatively large, few, several cm in diameter, with bright white ray flowers and yellow disk flowers.

Habitat: Foothills and montane, especially around mining towns and old cabins.

Notes: Often planted in the mining days, and now naturalized throughout the mountains of Colorado. The spread by rhizomes can make it a problematic, if attractive, weed. Look for the few large heads.

***Leucelene* "sand aster"**

Leucelene ericoides (Torrey) Greene

Syn. *Aster arenosus*

Plants low, usually under 10 cm, clumped, with short, sharp, linear leaves. Heads about 1 cm in diameter, single on a branch, with narrow white ray flowers.

Habitat: Dry grasslands and barrens on the plains and throughout the Arkansas drainage.

Notes: Look for the low bushy growth habit and small heads. Blooms in May and June, and although easy to see then, it becomes very inconspicuous later in the summer.

Liatris "gayfeather"

Liatris ligulistylis (A. Nelson) K. Schumann

Plants to about 0.5 m, sometimes less. Heads in broad purple spikes, clusters large with many florets, in separate segments on the stems. Leaves linear lanceolate.

Habitat: Wet meadows, plains to lower foothills.

Notes: A threatened species in Colorado, and rare in our region. It is distinctly more robust than our common species, *Liatris punctata*, which grows in dry grasslands, not wet areas. Look for the large separated heads in *L. ligulistylis*.

Liatris punctata Hooker

Plants to 30 cm, sometimes less in dry areas. Heads in relatively narrow spikes, clusters only indistinctly separated and with few florets. Leaves linear-lanceolate.

Habitat: Dry areas, plains, mesas, and lower foothills; extremely common.

Notes: This is an abundant species in late summer, providing striking purple spikes of color to contrast with the yellow composites with which it often grows.

There is an historical record of *Liatris squarrosa* from sandy soils in Pueblo Country, but this species has not been collected in recent times; it otherwise occurs in sandhills of eastern Colorado. It can be distinguished from *L. punctata* by the greater number of florets per head, and the more distinctive separation of the heads.

Lygodesmia "skeletonweed"

Lygodesmia juncea (Pursh) D. Don

Plants perennial, up to 0.5 m, much branched, with leaves reduced to small scales. Stems often showing spherical galls created by wasps. Pappus simple bristles, brownish white.

Habitat: Common in dry grasslands and overgrazed pastures at lower elevations.

Notes: Very similar to *Stephanomeria*, but differing in the smaller leaves and in pappus characters. See comments under *Stephanomeria* for how to tell the two genera apart.

Machaeranthera "tansy aster"

The tansy asters resemble true asters and daisies, but differ in having distinctly recurved (bent back) phyllaries. Although most of our species are purple-flowered, *M. pinnatifida* is yellow.

Machaeranthera bigelovii (A. Gray) Greene

Syn. Includes the dubiously distinct *M. pattersonii* (A. Gray) Greene, which is part of a interbreeding species complex; botanists continue to argue the correct nomenclature.

Plants somewhat bushy and branched, but occasionally stems single, up to about 0.5 m. Leaves toothed to entire. Heads with glandular phyllaries and purple ray flowers, disk flowers yellow. A highly variable species, apparently intergrading into *M. canescens*.

Habitat: Plains to tundra, extremely common, and somewhat weedy, occurring often along roadsides.

Notes: Extremely common, but often difficult to reliably distinguish from *M. canescens* on the plains.

Machaeranthera canescens (Pursh) A. Gray

Plants bushy and branched, leaves toothed to entire. Phyllaries chartaceous with green tips, not glandular. Intergrading with *M. bigelovii*.

Habitat: Dry areas on the plains and along roadsides.

Notes: A common weedy species, often difficult distinguish from *M. bigelovii*. Look for the lack of glands on the phyllaries in this species (use a lens).

Machaeranthera coloradoensis (Gray)Osterhout

Plants low, prostrate to mat forming, with suffrutescent (woody) base. Heads usually over 2 cm diameter, solitary on short stalks.

Habitat: Gravelly slopes, roadsides.

Notes: Known only in our region from sporadic occurrences in Fremont County near the Park County line. This species is currently believed rare in Colorado, but its total distribution and abundance is still unclear. Look for the low mats and large heads.

Machaeranthera pinnatifida (Hooker) Shinnery

Plants relatively short, with few stems, to ca 10 cm. Leaves pinnatifid, spiny tipped. Ray flowers yellow.

Habitat: Dry areas on the plains; especially common on overgrazed prairie.

Notes: A very common species and like most of the genus, highly variable. This is the only one of our *Machaeranthera* species with yellow heads.

Machaeranthera tanacetifolia (Humboldt, Bonpland, & Kunth) Nees

Plants annual, somewhat sprawling, leaves pinnatifid, heads relatively large (up to 2 cm), with purple ray flowers.

Habitat: Dry areas on the plains.

Notes: Look for the larger purple heads, and annual growth habit with the sprawling stems.

***Madia* "tarweed"**

Madia glomerata Hooker

Plants annual, stems erect, 20-70 cm. Stems and leaves sticky glandular, rankly aromatic. Leaves narrowly lanceolate, heads clustered at the ends of the branches, inconspicuous and partially enclosed by leaves.

Habitat: Roadsides and disturbed areas.

Notes: Alien weed, relatively uncommon in our region. Look for the sticky leaves and the smell, and the inconspicuous flower clusters partly covered by leaves.

***Matricaria* "chamomile, pineapple weed"**

Matricaria discoidea DC

Syn. *Matricaria matricarioides*, *Chamomilla suaveolens*; *Lepidotheca suaveolens*

Plants low, usually somewhat sprawling to erect. Leaves pinnatifid (divided to the midrib), with a strong pineapple scent. Heads lacking ray flowers, cone-shaped, yellowish-green.

Habitat: Disturbed areas, fields, plains to montane.

Notes: A relatively common adventive species, but not a particularly problematic one. Look for the very characteristic and pleasant pineapple odor.

Matricaria perforata Merat

Syn. *Tripleurospermum perforatum*

Plants to 20 cm or more, stems sometimes somewhat bent to sprawling. Leaves pinnatifid, not scented. Heads with white ray flowers, disks cone-shaped, yellowish green.

Habitat: Disturbed areas, homesteads and roadsides, montane.

Notes: This species is a larger, more robust version of *M. discoidea*, but with ray flowers that resemble *Leucanthemum*. It has been found in several locations in Teller County, and may be spreading.

***Melampodium* "blackfoot daisy"**

Melampodium leucanthum Torrey & Gray

Plants low and bushy, woody at the base and herbaceous above. Leaves narrowly lanceolate; heads to 2 cm broad, ray flowers white; phyllaries very broad and rounded.

Habitat: Barrens, rocky outcrops, and sandy or gravelly soils in the southern part of our region.

Notes: Common in Pueblo and Fremont Counties, less abundant in El Paso County. This species often blooms twice in the growing season: once in the late spring or early summer, and again late when monsoonal rains bring moisture.

***Microseris* "silverpuffs, false dandelion"**

Microseris nutans (Geyer) Schultz-Bipontinus

Plants perennial, to about 0.5 m, leaves entire to lobed. Heads yellow, lacking disk flowers, resembling *Agoseris*, but nodding rather than erect, and typically several per stem. Involucre usually somewhat turban shaped (turbinate).

Habitat: Dry meadows and forests, foothills and montane to subalpine

Notes: Uncommon, or at least undercollected here. Look for the several flowers per stem; possibly confused with the rare *Krigia*, but lacking the distinctive bract and phyllaries of *Krigia* and occurring in drier habitats. This is one of the several dandelion look-alikes.

***Nothocalais* "false dandelion"**

Nothocalais cuspidata (Pursh) Greene

Plants perennial, resembling a dandelion with entire leaves. Leaf margins distinctly wavy, with white crispy hairs. Flowers yellow, heads relatively large.

Habitat: Meadows and rocky areas, plains to lower foothills.

Notes: An early spring bloomer, and one of the many species that go by the common name of 'false dandelion'. The wavy-margined entire (not toothed) leaves are diagnostic.

***Onopordum* "Scotch thistle"**

The cultivated "Scotch thistle" is very clearly a thistle with its spiny leaves and sharp-spiny purple heads; it differs from the true thistles (*Cirsium*) in their extremely large size, and robust growth habit. They do not appear yet to have spread to the point of being a noxious weed, but have naturalized in the local area and may be spreading aggressively.

Onopordum acanthium L.

Plants biennial, to almost 3 m. Stems with broad spiny wings; leaves spiny, large, densely wooly hairy (tomentose) with fine hairs and appearing grayish. Heads numerous, to 3 cm in diameter, flowers purple.

Habitat: Fields, roadsides, at lower elevations.

Notes: The two Scotch thistle species are similar, but differ in whether the leaves have hairs or not.

Onopordum tauricum Willdenow

Plants biennial, to almost 3 m. Stems with broad wings, leaves spiny, large, glabrous. Heads numerous, to 3 cm in diameter, flowers purple.

Habitat: Fields, roadsides, at lower elevations.

Notes: Less common than *O. acanthium*, mostly occurring in the southern part of our region.

***Oonopsis* "goldenweed"**

Oonopsis resembles a somewhat bushy *Heterotheca*, but with larger heads and blooming in the early part of the summer. They often occur with *Artemisia bigelovii* in Fremont and Pueblo Counties.

Oonopsis foliosa (Gray) Greene

Plants low rhizomatous herbs to about 30 cm, somewhat woody at the base. Leaves gray green, oblong, to about 4 mm wide. Heads relatively large, to 3 cm high, erect, multiple in clusters at the stem tips. Phyllaries erect, not curved back, glabrous (lacking hairs).

Habitat: Dry grasslands, barrens, and open soil in the southern part of our region.

Notes: Very common in the Arkansas drainage. See notes under *O. puebloensis*, with which it can co-occur and possibly hybridize.

"*Oonopsis puebloensis*" n. sp. ined. (G. Brown).

Plants low rhizomatous herbs to about 30 cm, somewhat woody at the base. Leaves oblong. Heads relatively large, to 3 cm high; phyllaries distinctively recurved, upper stem, leaves and phyllaries pubescent (with hairs).

Habitat: Chalk and calcareous shale barrens, Pueblo and Fremont Counties.

Notes: Uncommon or rare in our region; apparently endemic to the Niobrara barrens outcrops, especially around Pueblo Reservoir. Look for the recurved phyllaries that are pubescent. The species has not yet been officially published, but appears distinctive most of the time. Hybrids are possible, as some populations have variable characters of both species.

***Oreochrysum* "goldenweed"**

Oreochrysum parryi (A. Gray) Rydberg

Syn. *Happlopappus parryi*; *Solidago parryi*

Plants perennial, herbaceous, stems to 50 cm, usually less; leaves bright green, lanceolate, entire, glabrous (lacking hairs) to puberulent (with short hairs); heads few to many, in open clusters, pappus bristly.

Habitat: Conifer forests and aspen groves, montane to subalpine.

Notes: Common, and appearing somewhat like a glabrous *Heterotheca*. Look for the open cluster of heads and bright green leaves that lack hairs (though some short hairs may occur).

***Palafoxia* "palafoxia"**

Palafoxia sphacelata (Nuttall) Cory

Plants herbaceous, stems leafy, to about 50 cm, often less in dry sites; leaves linear-lanceolate, 3-8 cm long; heads composed of ray flowers only, pink, 3-lobed at the apex.

Habitat: Sandy areas on the plains, uncommon in our region but more abundant to the south.

Notes: A very distinctive species with its pink heads of 3-lobed ray flowers.

***Parthenium* "feverfew"**

Parthenium tetraeuris Barneby

Syn. *Bolophyta tetraeuris*; ?=*Parthenium alpinum*

Plants forming low dense cushions; leaves oblong to lanceolate, with 3 somewhat obscure veins; heads hidden deeply within the cushions. Disk flowers creamy white, ray flowers lacking.

Habitat: Chalk and shale barrens in the Arkansas River drainage.

Notes: Overall rare in our region, but sometimes locally abundant and occurring in large cushions when found. This species can appear very similar to *Tetraeuris acaulis* and to *Eriogonum lachnogynum*, which have similar leaves and occur in the same habitat. Look for the low, buried heads or receptacles in *Parthenium*. Some botanists prefer to include this species under a more inclusive concept of *P. alpina*, which grows on similar habitats in n. Colorado, and differs primarily in having glabrous achenes. *Parthenium* blooms very early in the spring (April) and often is subject to either spring frosts or early drought that damage the development of achenes. This species may be identical to *P. alpinum*, which grows in nearly identical habitats in New Mexico and Wyoming and some botanists prefer to use *P. alpinum* for the Colorado material.

***Pectis* "fetid marigold"**

Pectis angustifolia Torrey

Plants low, bushy branched annuals with a lemon scent. Leaves narrowly linear, dotted with glands and containing stiff cilia (marginal hairs) at the base.

Habitat: Dry sandy soils on the plains.

Notes: Uncommon in our region, mostly occurring in the southern portion. In spite of the common name, the smell is an attractive lemon scent and does not resemble *Dyssodia*, also called fetid marigold.

***Pericome* "pericome"**

Pericome caudata A. Gray

Plants herbaceous but somewhat woody at the base and appearing shrub-like as hemispheric bushes up to 1 m; stems leafy with opposite, triangular leaves with a long acuminate (tapering to a sharp point) apex; heads composed of bright yellow disk flowers.

Habitat: Rocky cliffsides, foothills and lower montane

Notes: A beautiful and distinctive species with its long leaf tips and bright yellow heads; blooming abundantly in canyons in late summer.

***Petasites* "sweet coltsfoot"**

Petasites sagittatus (Banks) Gray

Plants herbaceous, with huge triangular-cordate basal leaves, green above and white below from dense woolly hairs. Heads in racemes with white ray and disk flowers, blooming very early.

Habitat: Cold wet bogs, montane to subalpine and lower alpine zones.

Notes: An unmistakable species common in wetter parts of the Colorado mountains, but uncommon here. Look for the huge leaves that are white woolly below.

***Picradenia* "rubberweed"**

Picradenia odorata (D.C.) Britton

Syn. *Hymenoxis odorata*

Plants annual, stems bushy branching, to ca. 2 dm. Leaves divided into very narrow segments, aromatic when crushed. Ray flowers toothed at apex, ca. 1 cm. wide.

Habitat: Sandy and gravelly soils, often in disturbed or overgrazed areas, plains.

Notes: this is a distinctive species with its tufted growth, often covered with bright yellow heads. Look for the smell when crushed, and the divided leaves. Abundant on the eastern plains, and almost certainly occurring the southern part of our region on overgrazed rangeland.

Picradenia richardsonii Hooker

Syn. *Hymenoxys richardsonii*

Plants perennial, bushy branched with numerous woody stems up to 0.5 m high. Leaves forming basal tufts around the stem, usually divided into 3-7 linear segments, somewhat fleshy. Heads flat-topped, ray flowers yellow.

Habitat: Gravelly areas, montane.

Notes: Common in South Park, known in our region from Teller and Fremont Counties. Look for the divided basal leaves and flat-topped heads.

Picradeniopsis

Picradeniopsis oppositifolia (Nuttall) Rydberg

Plants perennial, stems much branched, with woody bases, up to 25 cm. Leaves opposite, divided into 3-5 linear segments, long-hairy (strigose) with impressed punctate dots. Ray flowers few, yellow.

Habitat: Roadsides and gravelly or disturbed areas, plains and lower foothills.

Notes: A common weedy, though native, species. Although *Picradenia* and *Picradeniopsis* are superficially similar, they can be distinguished by size and elevation, as well as differences in the leaf morphology. Look for the distinctly glandular achenes (and ovaries in the disk flowers) in *P. oppositifolia*. Use a lens.

Prenanthes "white lettuce"

Prenanthes racemosa Michaux

Plants perennial, up to 1 m. Stems glabrous (lacking hairs), somewhat glaucous (with a bluish white surface), leaves oval to oblanceolate with long winged petioles, upper ones clasping the stems. Heads 8-16 in spikelike inflorescences; ray flowers purplish, involucre around 1 cm tall.

Habitat: Moist areas in the montane, especially in willow thickets along streams.

Notes: Uncommon or rare in our region. Look for the purplish flowers and clasping upper leaves.

Pseudognaphalium "cudweed"

This genus is very similar to *Gnaphalium* but differs in having larger heads (>5 mm high) that are not imbedded in leafy bracts; the stems are generally taller than those in *Gnaphalium*. The genus has characteristic "tomentum", woolly hairs. Whether this occurs on one or both sides of the leaves can help identify the species.

Pseudognaphalium canescens (de Candolle) Weber

Syn. *Gnaphalium wrightii*

Plants to about 30 cm; leaves woolly hairy on both sides; heads with white or only slightly straw-colored phyllaries.

Habitat: Sandy or gravelly soil, plains and mesas.

Notes: These species differ primarily in habitat and in characteristics of their phyllaries; look for the white phyllaries in this species to distinguish it from *P. stramineum*, which has straw-colored phyllaries and a wetter habitat.

Pseudognaphalium stramineum (Humboldt, Bonpland, & Kunth) Weber

Syn. *Gnaphalium chinense*

Plants to about 30 cm; leaves tomentose on both sides; heads with straw-colored phyllaries.

Habitat: Wet areas, pond margins, lower elevations.

Notes: See *P. canescens*. Look for the straw-colored phyllaries in *P. stramineum*.

Pseudognaphalium viscosum (Humboldt, Bonpland, & Kunth) Weber

Syn. *Gnaphalium macounii*

Plants to about 30 cm, leaves bi-colored: green and glandular above and white tomentose below.

Habitat: Forest openings, roadsides in the montane.

Notes: Generally occurs at higher elevations than our other species: look for the bicolored leaves with glands (use a lens) and white tomentum.

***Psilostrophe* "paperflower"**

Psilostrophe tagetina (Nuttall)Greene

Plants perennial, tomentose on the stems and leaves; stems to about 0.5 m. Leaves narrow. Heads with yellow ray flowers to about 1 cm long, 3-lobed, becoming papery in age.

Habitat: Plains grasslands.

Notes: Not documented in our region, but a possibility on the eastern plains of El Paso and Pueblo County. It has been collected just to the east of our region in Lincoln County and is common in Texas and Arizona.

***Pyrrcoma* "goldenweed"**

Pyrrcoma is a yellow-flowered genus similar to *Tonestus*, but taller and with a distinct cluster of basal leaves. The pappus is tawny rather than white. Two species occur on the margins of our region, but are not yet known from here. *Pyrrcoma uniflora* (Hooker)Greene occurs at high elevations in the Mosquito Range and has a large single flower on a prostrate to ascending stem and *P. clementis* occurs in alkaline sites of Park County. It has phyllaries with pale, thickened basal edges.

***Ratibida* "coneflower"**

The elongate, elevated receptacle (the central "cone") provides a distinctive profile for the central disk flowers of this classic genus of plains grasslands.

Ratibida columnifera (Nuttall) Wooton & Standley

Plants perennial, stems to 80 cm, leafy with alternate, pinnately divided leaves. Heads terminal; receptacle a long column, 10-40 mm high, with deep brown disk flowers. Ray flowers yellow, conspicuous, 8-30 mm long.

Habitat: Mesas and plains.

Notes: This species can hybridize with *R. tagetes*. The hybrids tend to have reddish ray flowers and shorter receptacles, with morphology intermediate between the two species.

Ratibida tagetes (James) Barnhart

Plants perennial, stems relatively short, to ca. 0.4 m. Stems leafy, with pinnately (with narrow segments) divided leaves. Heads terminal, receptacle globular to ellipsoid, 6-15 mm high, with brown disk flowers. Ray flowers yellow, typically with reddish bases, less than 10 mm long.

Habitat: Plains, especially in southern El Paso and Pueblo Counties; often in areas with spring moisture or standing water.

Notes: See notes on possible hybrids with *R. columnifera*. The "pure" strains of this species are very distinctive, with shorter reddish ray flowers and a less columnar central portion.

***Rayjacksonia* "goldenweed"**

This odd Great Plains genus resembles both the gumweeds and a (relatively rare) sand dune genus of southeastern Colorado called *Prionopsis*. It is named for botanist Ray Jackson, and is a relatively uncommon late-blooming species of sandy areas in southern El Paso and Pueblo County. This particular group has fallen under many different names over the years, but the species is quite distinctive. Check the achenes to distinguish it from *Prionopsis*, which it resembles closely. *Prionopsis* has glabrous achenes, this species has distinctly hairy ones.

Rayjacksonia annua R.M. Hartman & M.A. Lane

Syn. *Happlopappus annua*, *Machaeranthera annua*

Plants annual, to about 30 cm. Leaves spiny-toothed on the margins, narrowed at the base. Phyllaries somewhat recurved, and entire plant sticky gummy, resembling *Grindelia*. Pappus of stiff bristles, achenes hairy.

Habitat: Sandy areas on the plains, often in overgrazed alkaline soils. Thus far known only from Pueblo County, but probably occurring in southeastern El Paso County as well.

Notes: Resembles an annual *Grindelia* (check the root system) but with a distinctive bristly pappus, and lacking basal leaves. The entire plant is sticky in *Rayjacksonia*.

***Rudbeckia* "black-eyed Susan"**

The dark centers of the meadow species *R. hirta* provides the classic view of this genus, one that is often used horticulturally. Our montane wetland species, *R. ampla*, has a distinctive greenish yellow center and does not live up to the common name of the genus.

***Rudbeckia ampla* Nelson**

Plants perennial, tall, with stems typically about 1 m in height. Leaves alternate, toothed, lobed or divided. Ray flowers yellow, 3-6 cm long, disk flowers yellow or greenish.

Habitat: Lower foothills and montane, around streamsides and springs.

Notes: A tall species, with a diagnostic greenish yellow center surrounded by long yellow ray flowers.

***Rudbeckia hirta* L.**

Plants perennial, stems about 0.5 m, erect, pubescent and often with purple dots. Lower leaves broad, upper leaves become linear. Ray flowers yellow, to about 3 cm long, disk flowers deep black.

Habitat: Dry meadows, foothills to montane.

Notes: Look for the deep black centers and long yellow ray flowers.

***Rydbergia* "old man of the mountain"**

The striking large, nodding heads of this tundra species is a common sight for alpine hikers. No other true sunflowers are found at the high elevations.

***Rydbergia grandiflora* (Torrey & Gray) Greene**

Syn. *Tetraneuris grandiflora*

Plants relatively short, to about 15 cm. Stems stout, with grayish woolly pubescence. Heads single, with yellow ray flowers to about 4 cm long.

Habitat: Alpine tundra meadows.

Notes: Occurring in our region only on Pikes Peak, but common throughout the Colorado mountains. Look for the large single heads and woolly stems.

***Schkuria* "threadleaf"**

***Schkuria multiflora* Hooker & Arnott**

Syn. *Bahia neomexicana*

Plants annual, stem to 20 cm, slender and branched from the base. Leaves opposite to alternate, divided into linear filiform segments. Heads lacking ray flowers, involucre ca 5 mm high.

Habitat: Plains, usually in sandy soils or around ponds.

Notes: This is an uncommon or overlooked plains species. Look for the branching stems and small, rayless heads. It often blooms late in the season.

***Scorzonera* "false salsify"**

***Scorzonera laciniata* L.**

Syn. *Podospermum laciniatum*

Plants annual or biennial, stems 1-several, typically branched above. Leaves, esp. the basal ones, pinnatisect (divided to the midrib), alternate, to 20 cm long. Disk flowers lacking, ray flowers yellow, resembling *Tragopogon*. Pappus noticeably plumose. Juice abundant, milky, staining deep brown.

Habitat: Roadsides, disturbed areas, fields, lower elevations.

Notes: Adventive species, becoming regionally common and spreading aggressively in gardens and alongside roads. The plumose pappus is distinctive, and distinguishes this species from *Tragopogon*, which it somewhat resembles. The sap stains deeply, turning brown on skin or clothing.

***Senecio* "groundsel"**

This large group of species posed a number of taxonomic problems, and there is much debate about how to subdivide the genus; undoubtedly more than a single genus is represented in this eclectic group, but differentiating them on morphological grounds is a challenge. In general, the *Packera* group and the