

APIACEAE (UMBELLIFERAE) THE CARROT OR PARSLEY FAMILY

A FAMILY OF IMPORTANT MEDICINAL
AND CULINARY HERBS AS WELL AS
SERIOUS TOXINS

Important worldwide, the Apiaceae still holds many secrets about its chemical properties

- Although the family is easy to recognize, identifying genus and species can be challenging
- The family consists of mostly herbaceous, nonwoody perennials and annuals
- The leaves vary from highly dissected and fern like to simple, although usually the leaves are at least lobed or deeply divided
- The leaves have a sheath at the base
- The leaves have a number of distinctive, sometimes pleasant odors, often concentrated in oil tubes in stems and fruits

The majority of Apiaceae bear their small to tiny flowers in compound umbels (umbels of umbels), a distinctive trait

- The majority have white or yellow flowers, occasionally red or purple
- Each flower has 5 minute (sometimes missing) sepals, 5 separate petals, and 5 stamens
- The ovary is inferior and topped with two swollen style bases (the *gynobase*), and 2 styles
- The two-sectioned fruits called *schizocarps* separate when ripe into 2, one-seeded sections
- Details of these schizocarps are often needed to make a positive identification

Apiaceae live in a wide variety of environments, from marshes and other wetlands to dry fields, forests, and mountain meadows

- Many species are also pernicious weeds, introduced from the Mediterranean region either by design or by accident
- Among these we find the toxic poison hemlock (*Conium maculatum*), the useful fennel (*Foeniculum vulgare*), along with smaller weeds such as bur chervil (*Anthriscus scandicina*) and shepherd's needles (*Scandix pecten-aboriginum*)

The most serious of these invaders because of its lethal properties is the poison hemlock, *Conium maculatum*, whose umbels of white flowers look like many others



Besides an unpleasant odor, poison hemlock can be identified by the purple blotches on its stems and the finely divided fernlike leaves



Sometimes the European Queen Ann's lace, *Daucus carota*, is confused with poison hemlock but the stems and leaves smell like carrot and have no purple spots



In fact, Queen Ann's lace is none other than the cultivated carrot gone "wild". Here you see the distinctive shape of the old umbels in the fruiting stage



Wild fennel is often incorrectly called wild anise (which never grows wild in California). It is easily identified by the anise odor of the leaves and the yellow flowers



Fennel leaves are among the most highly dissected with threadlike leaflets in bright green



The smaller stature, the coarser leaves, and strong celery odor help identify “wild” celery, *Apium graveolens*, which lives in wetlands but has escaped from gardens



Shepherd's needles, *Scandix pecten-aboriginum*, is a small weed with carrotlike foliage and flowers with irregular petals and long slender ovaries that are needle like



Now we'll look at some of California's native Apiaceae.
We'll start with the tall ones such as the widespread
cow parsnip, *Heracleum maximum*



Cow parsnip has large, coarsely divided leaves and schizocarps edged by two wings



Of similar stature and sometimes confused with cow parsnip are the angelicas (*Angelica* spp.), sometimes used medicinally. Here is *A. arguta* from the northern mountains.



Angelica leaves are more divided than cow parsnip, often with rounder leaflets and a different odor. Also angelica fruits don't have wings. This species is *A. hendersonii* from coastal bluffs.



Here are young schizocarps of angelica. Notice this species has furry hairs along the sides but lacks conspicuous wings. These belong to *A. tomentosa*.



Another tall Apiaceae is ranger's buttons,
Sphenosciadium capitellatum, which grows in wet
meadows in the high mountains



Ranger's button leaves are more highly divided yet, but the main identifying feature is that the flowers are in heads not umbels as in most Apiaceae



The most important tall Apiaceae is *Cicuta douglasii* or water hemlock, whose roots can cause convulsions and death. The best indication of the plant is its habitat in wetlands and along streams, sometimes growing with water cress.



Water hemlock's leaves are coarsely twice divided but the most important identifying feature is the chambered roots.



We'll turn now to the lower growing Apiaceae. Among these, perhaps the most distinctive genus *Eryngium* (button parsley), whose umbels are also heads but heads surrounded by spiny bracts like a thistle



Eryngiums live in wetlands such as vernal pools and marsh edges. The last one, *E. articulatum*, has showy purple flowers but most have tiny, greenish blossoms



True to its specific epithet, *E. armatum* (= armed), has spiny thistlelike leaves in addition to the spiny bracts.



A more “conventional” Apiaceae from wetlands is the water parsley, *Oenanthe sarmentosa*. Its stems creep in shallow water



Another aquatic genus, *Hydrocotyle* or pennywort, has recently been moved to the related Araliaceae. Hydrocotyles feature round leaves and tiny green flowers and are invasive creepers in shallow water



In this coastal marsh, *Hydrocotyle* on the left is battling it out with *Oenanthe* for ascendancy of this niche.



One more important genus in Apiaceae that replaces the umbels with heads of flowers is sanicle, *Sanicula*. Most of these live in woodlands and have yellow or red-purple flowers. Here are the leaves of the woodland snicle, *S. crassicaulis*.



The schizocarps of sanicles are also specialized, covered with hooked barbs that cling to passerby



The purple sanicle, *S. bipinnatifida*, is noteworthy for having red-purple flowers in place of yellow ones



Appropriately named, footstep-to-spring (*S. arctopoides*) looks like yellow foot prints and occurs on coastal bluffs and meadows.



Tuberous sanicle, *S. tuberosa*, is common on rocky grassy areas. Its feathery leaves smell of cilantro but it may well be partly toxic.



The genus *Perideridia* or yampah looks like a more typical Apiaceae but scaled down. Here you see the summer-flowering *P. kelloggii* that lives in dry meadows and open woods.



Most of the yampahs, especially those from the mountains such as *P. gairdneri*, have small edible tubers underground and were a favorite seasonal food of the Indians.



Yampah schizocarps are slightly ribbed but not winged.



Another smaller, white-flowered Apiaceae is *Ligusticum* or native lovage, related to the European lovage, *Levisticum*. This species is the coastal *L. apiifolium*, whose leaves smell like celery.



Just to demonstrate how closely similar leaves of Apiaceae can look, here we have poison hemlock in the top half of the photo and lovage in the bottom half.



Despite being a plant only 2 feet high, coast lovage has a well developed woody rhizome underground



The mountain lovage, *L. grayi*, is far more common than its coastal counterpart but has a similar appearance.



Here are the celery-scented leaves of *L. grayi*.



Besides the widespread occurrence of woodland sanicle in shade, a distant relative, sweet cicely (*Osmorhiza chilensis*) joins it in the same environment



Sweet cicely is distinguished by fuse-shaped schizocarps lined with barbs. The whole plant has the fragrance of anise; the genus name means smelly root



A second species, *O. occidentalis*, is common in rocky mountain meadows, grows taller, and has pale yellow flowers but the same odor.



O. occidentalis flowers.



The most common diverse genus of low-growing Apiaceae occur in the genus *Lomatium*, aka biscuit root. *L. caruifolium* is common in grasslands and like many lomatiums has fernlike foliage and yellow flowers.



Common on rocky slopes and with paler flowers is the so-called hog fennel, *L. dasycarpum*.



Highly decorative, the schizocarps of lomatium have two wings similar to what is seen in cow parsnip.



L. nudicaule, found in rocky places in the north, has the main stem inflated at the tip just below the umbels of flowers.



L. californicum, found in dry woods, has leaves similar in smell and shape to celery and was known to be used medicinally. Unfortunately, the edible qualities of some of these plants is not known.



L. dissectum has large, fernlike leaves and lives in rocky slopes in the north. It is sometimes used medicinally.



So far this presentation has emphasized native Apiaceae. Many have odors similar to well known culinary herbs, but the Indians did not flavor their food this way so we remain ignorant of possible uses.

- Most of the Apiaceae used as culinary herbs comes from the Mediterranean Basin and other parts of the “Old” World.
- Among these is parsley, *Petroselinum* spp., parsnip (*Pastinaca*), coriander and cilantro (*Coriandrum sativum*), dill (*Anethum*), and anise, to name a few.

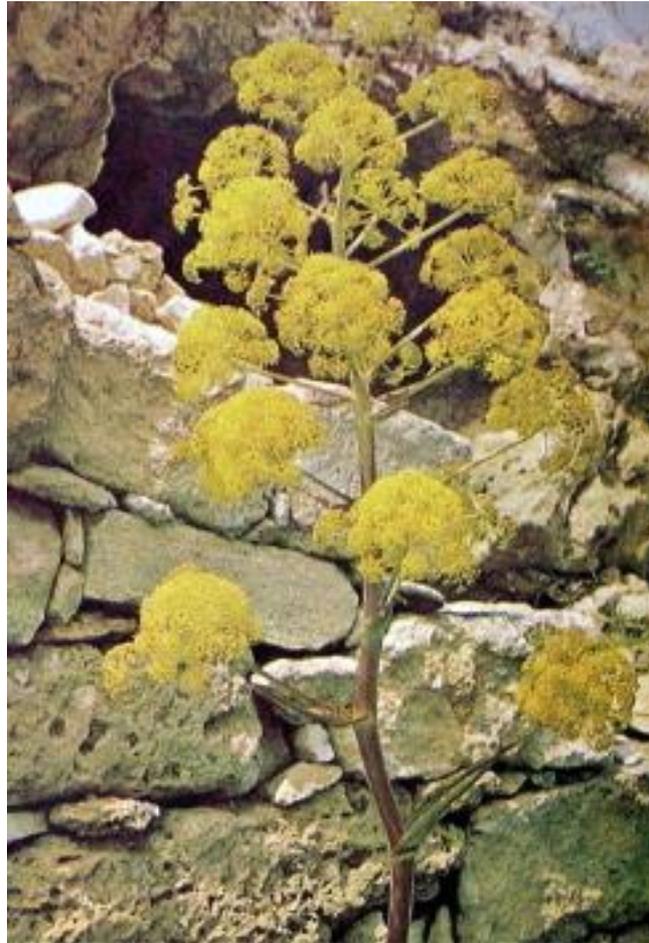
Dill, *Anethum graveolens*, looks like a miniature version of the invasive fennel but the leaf fragrance is entirely different



Similar in overall appearance, also, is the parsnip, *Pastinaca sativa*, but the leaves are coarser and the plant produces a stout, edible taproot.



Several other Mediterranean genera are sometimes cultivated for their bold, sculptural qualities. A good example is the huge *Ferula communis*.



Another Mediterranean is the sea-holly, *Eryngium...*, noted for its hollylike leaves and blue flowers. The genus while inconspicuous in California has some gigantic species elsewhere.



To conclude this presentation, we'll also look at the closely related family Araliaceae or ginseng family, another family with medicinal uses

- Araliaceae is by and large tropical or subtropical, with only a handful of species in the temperate zone
- The family is generally characterized by gigantic herbaceous perennials, shrubs, and trees as well as some woody vines
- The leaves are often highly compound, some of the with very intricate patterns
- Although some are fragrant, the fragrance is seldom like Apiaceae
- Although the tiny flowers are in umbels, the umbels are arranged most often in spikes, racemes, or panicles
- Araliaceae typically has fleshy berrylike fruits, not schizocarps

The best known temperate genus is *Hedera* or true ivy, with *H. helix* or English ivy the most widely cultivated. Here you see typical ivy leaves.



Ivies usually only flower when the stems climb into the sun. Here you also see the dark black-purple fruits which birds eat and disperse.



Besides the transfer of *Hydrocotyle* to *Araliaceae*, California's only other native is the gigantic herbaceous perennial known as elk-clover, *Aralia californica*. Here you see the enormous leaves.



The tiny white summer flowers of elk-clover look like ivy blossoms and the fruits that follow similar to ivy berries.



The genus *Aralia* is widespread across the Northern Hemisphere with many other species. Related is the herbaceous perennial ginseng, *Panax quinquefolia*, now nearly extinct in eastern forests because of the demand for the extracts.



From China comes the giant subwoody perennial called rice paper plant or *Tetrapanax papyrifera* with huge soft fuzzy palmately lobed leaves



Of a more sensitive nature to winter cold, the octopus plant, *Schefflera*, a genus of shrubs and small trees sometimes finds its way into sheltered gardens. The striking leaves are palmately compound into fanlike leaflets.

