

**SAXIFRAGACEAE AND CRASSULACEAE, THE  
SAXIFRAGE & STONECROP FAMILIES**

TWO IMPORTANT ALTHOUGH MORE  
MINOR NATIVE FAMILIES

This presentation is for two families, which although different in leaf forms, share certain floral features

- We'll start with the saxifrage family, Saxifragaceae, a family named for “breaking rocks”
- The definition of this family has varied greatly over the last century or so
- In many of the older books, the mock oranges, currants, and gooseberries were all included in this family, making the family difficult to define
- Happily in this case, those woody shrubs have been removed to other families, leaving the saxifrages with just herbaceous plants, mostly perennials

The saxifrages are widespread, especially in moist forests and mountains across the Northern Hemisphere, with numerous species of *Saxifraga* in the mountains of Europe and Asia

- The family is noted mainly for its ornamentals, plants often used in shade gardens and, in the case of saxifragas, in rock gardens
- Few have other uses, although the Indians sometimes used the stalks of umbrella plant (*Darmera peltata*) as food
- A few also are used medicinally as in the tannins present in *Heuchera* stems

Most of the California species are easy to recognize in leaf, the majority bearing rosettes of broad, often round leaves, sometimes with palmate lobes and lined with teeth or scallops

- The flowers of saxifrages are small, in varied kinds of inflorescences, and mostly yellow, white, or pink
- Each flower (usually) has 5 separate sepals and petals and 5 or 10 stamens attached to the top of a cup-shaped hypanthium (often quite short)
- The pistil may have a superior or half inferior ovary and 2 or more chambers, or there may be two separate simple pistils
- The fruit is either a capsule (compound pistil) or a follicle (simple pistil) with many tiny seeds inside

In California 4 or 5 different genera share a similar leaf design:  
mostly basal leaves that are round in outline and variously  
palmately toothed or lobed. These genera are mostly told apart  
by flower design

- Among them, we have *Heuchera* or alumroot, with open panicles of tiny bell-shaped flowers,  
*Tellima grandiflora* (fringe-cups), with slender racemes of cup-shaped flowers with fringed petals
- *Tiarella trifoliata unifoliata* (sugar scoops), with open panicles of shallow bell-shaped flowers and unique fruits
- *Tolmiea menziesii* (piggyback plant), with slender racemes of narrow, maroon-red flowers
- *Lithophragma* (woodland star), with slender racemes of wide open white or pink flowers with snowflake-like petals
- *Mitella* (mitrewort), with racemes of star-shaped green to white flowers with snowflake-like petals and...
- *Darmera peltata* (umbrella plant), with enormous umbrellalike leaves

Here are typical heuchera leaves. Note the lobes and the paler patches on the leaves, which in some cases...



...become variegated or mottled. The species most often with this trait is *H. micrantha*, the common alumroot widespread in foothill woodlands and forests



Like most saxifrages, *H. micrantha* occurs on rocky slopes. Here you see the airy panicles of tiny flowers that are either white or pale pink



The shaggy alumroot, *H. pilosissima*, typifies the north coast. The flowers are coarser and with shaggy hairs



A close look at *H. pilosissima* showing the pilelike hairs on stems and flowers



The island alumroot, *H. maxima*, from the Channel Islands, features extra large leaves, sturdy panicles, and larger flowers than the others



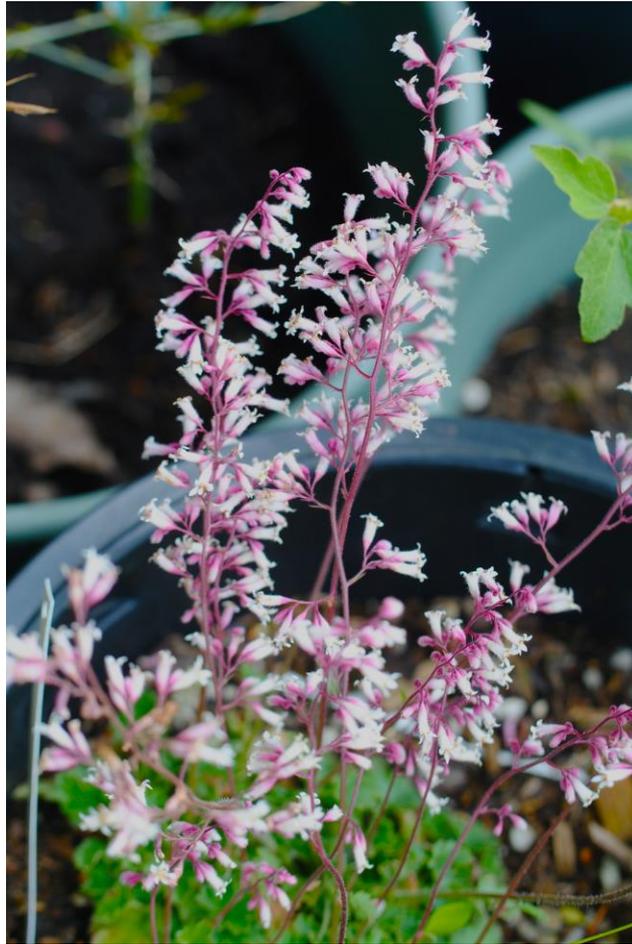
Common growing among granite boulders in the mountains is *H. rubescens* the crevice heuchera, a scaled-down species with close-set small leaves and short panicles of tiny flowers. This species is easy to grow in foothill gardens.



*H. cylindrica*, from the Klamath Mountains has narrow racemes of cylinder-shaped flowers, while...



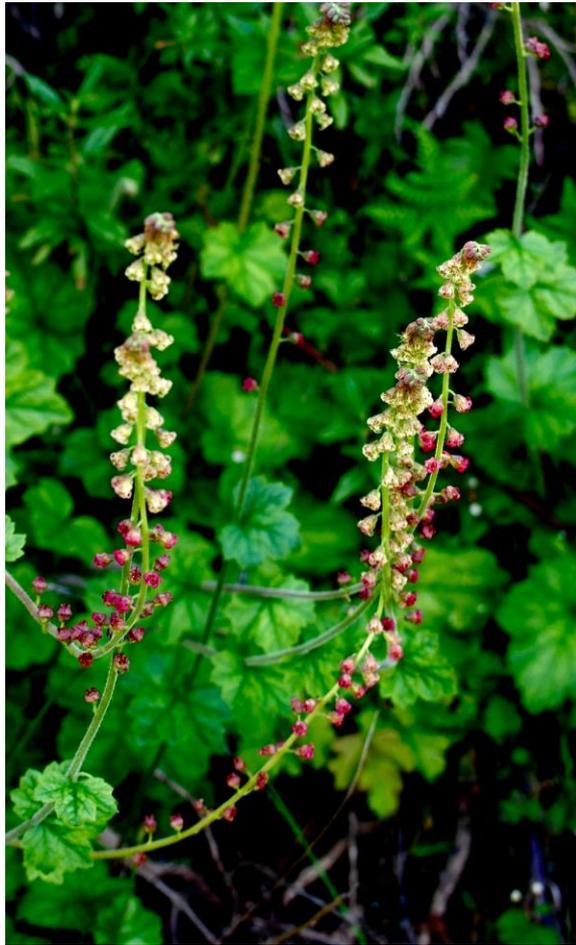
...*H. brevistylum* from the San Bernardino Mountains is a dwarf with horizontally held, pale pink bells. Both species are rare as are several others that are seldom seen.



*H.* 'Wendy' is one of many hybrid cultivars developed for dry shade, often with *H. maxima* and *H. sanguinea* (coral bells from Arizona) as parents.



Fringe-cups, *Tellima grandiflora*, is somewhat of a botanical joke, the specific epithet merely reflecting the fact that the flowers are bigger than the related *Mitella*, and the genus name an anagram



Fringe-cup leaves look similar to heucheras. This species lives in moist forests in central and northern California



Fringe-cup flowers are indeed cup shaped, in a slender raceme,  
and have fringed petals that open pale green then fade to deep  
pink in age



Sugar scoops, *Tiarella trifoliata unifoliata*, lives in moist coastal forests often near water. The leaves are subtly different in shape though with a similar overall pattern.



Sugar scoops has tiny white bell-shaped flowers somewhat like heucheras but the habitat is altogether moister and...



The unique seed pods look like old-fashioned sugar scoops



Like sugar scoops, the piggyback plant, *Tolmiea menziesii*, lives in moist coastal and uplands conifer forests. Sometimes baby plantlets sit on top of the leaves, giving rise to the common name.



Piggyback flowers are unique, slender dull red flowers with 5 sepals, 4 petals, 3 stamens, and 2 pistils, a numerical series unlike other saxifrages  
unlike other saxifrages



*Lithophragma*, the woodland star, is widespread in woodlands and open forests. Although the leaves look similar to the others mentioned, they're far smaller and sometimes, as seen here, purpled tinted



Two common foothill woodland stars are *L. heterophylla* with white flowers and a squared off hypanthium (left flower), and...



...*L. affine* with a rounded to vase-shaped hypanthium



The beautiful *L. parviflorum* features pink flowers and grows on rock outcrops, especially in the Sierra foothills



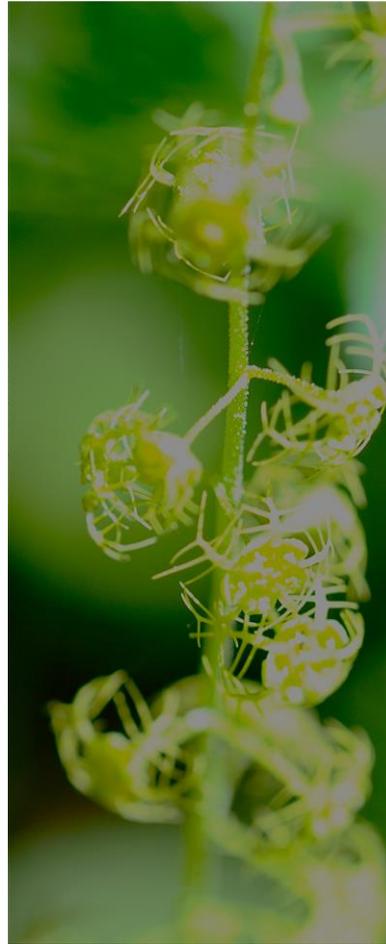
The dwarf *L. glabra*, from high mountain rocky meadows, has pale pink flowers with sharply pointed petal lobes



Also with small leaves is *Mitella* or mitrewort (aka bishop's cap) with several species in permanently wet wooded areas. The stems creep to form large colonies.



Here you see the curious green flowers of *M. pentandra*, the petals divided into fragile-looking snowflake-like lobes. Unfortunately, the genus has now been split with differences that are difficult to see



Mitrewort seed pods split open to display seeds that look like little green or brown eggs



The giant of the group, *Darmera peltata* aka umbrella plant or Indian rhubarb, has huge umbrellalike leaves to 3 feet or more across. It lives along streams in the lower fringe of the conifer forests in the Sierra and Klamath Mountains



Dormant to rhizomes in winter, umbrella leaf produces pink flowers on sturdy stalks before the new leaves emerge. Note the two separate dark pink pistils



Umbrella plant leaves turn beautiful shades of bronze and red in fall before the plants go dormant.



One more genus deserves mention for its rounded leaves, in this case lined with coarse blunt teeth: *Boykinia* or brook saxifrage. Here you see *B. occidentalis* with open panicles of tiny white starlike flowers



*B. occidentalis*, the western brook saxifrage, is widespread on rocky shelves by waterfalls, permanent streams, and other wetlands often in company with ferns in the genus *Adiantum*



By contrast, *B. major*, the mountain brook saxifrage, has larger, more deeply lobed leaves, and lives on waterways at middle elevations in the mountains.



Mountain brook saxifrage produces clusters of larger pale pink to white flowers with rounded petals, blooming in summer



The type genus of the family, *Saxifraga*, has many beautiful species in high mountains, although the California ones are seldom very showy. Now the genus has been split, and most of the species are in the genus *Micranthes*. *M. californica* has oval, toothed leaves.



California saxifrage has tiny white flowers with red anthers. This species is common on mossy shaded banks in the foothills, blooming early and then going dormant.



By contrast, the delicate moss saxifrage, *M. bryophora*, is a delicate annual on rocky slopes in the mountains, with tiny white flowers above mosslike leaves.



The beautiful close up detail of a moss saxifrage flower with yellow spots on the petals and red ovary. Tiny plantlets are often interspersed with the flowers, each dropping to directly start a new plant.



The rounded, coarsely scalloped leaves of Merten's saxifrage, *M. mertensiana*, is reminiscent of brook saxifrage leaves. It occurs on mossy rocks near waterfalls in the north Coast Ranges.



The coarse oval leaves and tall stalks of tiny white flowers mark *M. aprica*, a common sight in wet mountain meadows, blooming in summer.



The genus *Parnassia*, aka grass-of-Parnassus (itself a strange common name), has now been removed from the saxifrage family to its own family, Parnassiaceae. It is common on wet rocky slopes and mountain meadows, blooming in late summer.



Although *Parnassia palustris* flowers look similar to saxifrages, the stamens are entirely different—besides 5 fertile stamens, there are 5 sterile stamens, each ending in gland-tipped appendages.



Turning now to the stonecrop family Crassulaceae, we have a group of leaf succulents—fleshy leaves that store extra water for times of drought

- The stonecrop family occurs worldwide but is especially abundant in the mountains of Mexico, parts of Southern California, and most particularly in the drylands of South Africa
- The many species are attractive subjects for rock gardens, many featuring beautiful leaves and many also with colorful although small flowers
- The main use of the family is as ornamentals but a few, such as the rosecrown (*Rhodiola integrifolia*) are important medicinals known as adaptogens

The Crassulaceae are mostly herbaceous perennials (a few annuals also) but some are small semiwoody shrubs

- The family has thick, fleshy, usually simple (occasionally compound) leaves, many with waxy coverings of gray and others with purple and red tints from accessory pigments
- The flowers are usually small and produced in quantity with a variety of colors, although yellow and white are the most representative ones
- The flowers are borne in cymes or panicles and are star-shaped to bell like
- Most flowers have 5 separate sepals and petals, 5 or 10 stamens, and most often 5 separate simple pistils that ripen into follicles with tiny, dustlike seeds

Although a couple of nonnatives are occasionally naturalized along the coast, most species are native

- The genera fall out like this:
- *Dudleya* usually has basal rosettes of narrow to lance-ovate leaves and a flowering stalk that arises between the leaves, with starlike to narrowly vase-shaped yellow, orange, red, pink, or white flowers. It contains many species on rocky slopes, especially in Southern California
- *Sedum* (stonecrop) usually has basal rosettes of variously shaped leaves and flowering stalks that arise from the center of the rosette, bearing cymes of yellow, cream colored, or white starlike flowers. Many species occur in the northwest
- *Sedella* (annual stonecrop) are tiny annuals on rocky scree with bright yellow, starlike flowers
- *Rhodiola* (rosecrown) has fleshy oval leaves from underground tubers and bears dark red starlike flowers, and
- *Crassula* (pygmy weed) has tiny annuals with beadlike leaves and minute greenish to red-tinted flowers among the leaves

California is home to the main diversity of the genus *Dudleya*, a genus often referred to by the common name dudleya as well as a few others for certain species

- Some of the traits to look for to identify species include:
- Size, color, and shape of leaves,
- Number of rosettes per plant,
- Diameter of the stems (below the leaves),
- Flower color,
- Shape of flower (petals spreading or not),
- Degree of fusion of petals
- Details of branching of the inflorescence

The most distinctive group of dudleyas are those that go dormant to tuberous stems underground in summer, the leaves unable to retain enough water to sustain them. Here you see a field of island dudleya, *D. nesiotica*



Island dudleya is found only near Fraser Point at the western end of Santa Cruz Island. Here you see the short stems and upright, white flowers



A few dudleyas display single, large rosettes of leaves, sometimes measuring over a foot across. Of these, *D. pulverulenta*, the chalk dudleya is most often encountered.



Chalk dudleya is common on cliffs and steep rocky slopes in the coastal mountains of Southern California. It sends out horizontal flowering branches with nodding red flowers in summer.



Similar in overall appearance, Arizona dudleya, *D. arizonica*, has somewhat smaller leaf rosettes and in bloom, has upright flowers. It's found on rock faces in desert mountains.



The spectacular *D. brittonii* or Britton's dudleya looks similar to chalk dudleya but the leaves are narrower and the flowers are pale yellow and upright. This species grows on coastal bluffs in Baja California just south of the border.



By contrast, many of our dudleyas form multiple crowns over time. This bluff lettuce, *D. farinosa*, can live long and produce over 100 rosettes from a single plant. This clone is growing on granite at Pt Lobos



*D. farinosa* is typical of coastal bluffs and dunes in northern and central California. Here you see the deep red color, which develops from exposure to sun.



*D. farinosa* produces dense clusters of pale yellow, narrow flowers in summer.



The Channel Islands are home to several rare dudleyas, growing mostly on steep bluffs near the ocean. This one, *D. greenei*, has gray-green leaves similar to *D. farinosa* (the leaves are narrower) and similar clusters of pale yellow flowers, usually in late spring.



A closer view of *D. greenei*. Notice how the flowering stalks are often horizontal because of the plants location on vertical cliffs.



Another island endemic is *D. candelabrum*, the candle-holder dudleya (alluding to the candelabralike clusters of flowers), which is distinguished by green leaves atop a thickened basal stem.



Candle-holder dudleya makes a superb container plant.



No small number of dudleyas come from the mountains of Southern California like this sticky dudleya, *D. viscosa*. The narrower, bright green leaves are decidedly sticky to the touch.



Similar in overall appearance the “edible” dudleya, *D. edulis*, has narrow, bright green leaves, but they are not sticky.



*D. edulis* flowers are wide open and pale cream color



*D. attenuata* is another species from far Southern California, being more common in Baja California. It has narrow, gray leaves.



*D. attenuata* flowers are similar to *D. edulis* in overall shape and color.



Strangely, only a few dudleyas enter the desert proper. The most widespread is *D. saxosa*, literally the rock dudleya. Note the narrow green leaves



The rock dudleya has rather dull, yellow-green flowers but the stems, as seen here, are bright rose pink.



Back closer to home is the widespread *D. cymosa*, a lover of hot, exposed rocks throughout the Coast Ranges and Sierra foothills.



*D. cymosa* produces small rosettes of pale green to gray-green, relatively broad leaves, which often shrivel by the end of summer



Blooming in midspring, *D. cymosa* is noted for its bright, often orange to red flowers.



When sourcing *D. cymosa*, it's best to select the form in flower. Some, like this one, have golden yellow flowers, while others...



...have rather pale yellow to cream colored flowers. That form is especially typical of Mt. Diablo and the Pinnacles.



There are many more dudleyas, happily some rare ones available from Annie's Annuals. Let's now turn to the sedums.

- The genus *Sedum*, from the Latin to be seated (the leaf rosettes are often seated next to the soil), consists of a few hundred species spread over the world, with perhaps the greatest diversity in the mountains of Mexico
- Sedums are noted for their central flowering stalk and wide variety of leaf shapes
- The majority has starlike yellow, white, or pinkish flowers
- Despite their fleshy leaves, few sedums actually live in deserts, instead...
- Living on cliffs and steep rocky slopes from seashore to high mountains

Like the dudleyas, a few sedums have a broad distribution while others are rare and limited to special habitats. The most diverse and widespread is *S. spathulifolium* with spathula-shaped leaves. It grows on coastal bluffs and on into middle elevations in the mountains.



A variant of *S. spathulifolium* was once known as a separate species, *S. purdyi*. It differs from the typical form in having rosettes nearly flat and is typical of the Klamath Mountains.



Regardless of leaf form, *S. spathulifolium* has wide open, bright yellow, starlike flowers



Oregon stonecrop, *S. oregonum*, has leaves similar to *S. spathulifolium* except the leaves are thicker, bright green, and similar in size throughout the rosette.



The bright yellow starlike flowers of Oregon stonecrop appear in early summer.



Widespread in inland rock outcrops in the foothills is *S. radiatum*, one of the few annual species. It features tiny rosettes of narrow leaves.



*S. stenopetalum* has a similar leaf shape but forms broad perennial clumps with red-tinted leaves. It grows on rock outcrops in the high mountains.



*S. stenopetalum* produces flat-topped clusters of bright yellow flowers in summer.



The mountain stonecrop, *S. obtusatum*, is another widespread species, this one in the high mountains. Here you see a bright green-leafed form



Mountain stonecrop has broad leaves with a blunt tip. Here you see a form with blue-green leaves



Mountain stonecrop flowers are narrow and often pale yellow  
but...



...sometimes the flowers are cream colored with a pink tint

Previously, the rosecrown, *Rhodiola integrifolia* was placed in the genus *Sedum*, but this widespread circumboreal plant has dark red flowers with only 4 petals (instead of 5)



Rosecrown is widespread in the high mountains, often near timberline. Here you see colony surrounding a granite rock. Note the leaves are not confined to the base of the plant.



Rosecrown goes dormant to thick fleshy underground stems in winter, resprouting and blooming in summer.



Two annual genera (in California) include the former *Parvisedum*, which is now called *Sedella* (little sedum). This genus typifies thin, often volcanic soils in the Sierra foothills, blooming early in great abundance.



Growing only inches high, annual stonecrop has yellow starlike flowers reminiscent of *Sedum* but the plants only live long enough to produce seed, then die to await the next winter rains. The 3 native species look similar



Worldwide in distribution, our native species of *Crassula* are minute annuals called pygmy weed owing to their tiny size. The 2 similar species have minute, rounded leaves that are tinted red.



Here pygmy weeds is growing with a native cudweed; you can see how much tinier its leaves are than its neighbor. Pygmy weeds seek hard-packed, usually bare soils that are temporarily wet. The minute flowers hide between leaves.



The stonecrop family has many species unknown in the horticultural trade, but yet there are many that are available from specialists with real garden potential.

- Both sedums and dudleyas are excellent choices for a rock garden or in containers with other succulents and rock ferns
- The most commonly encountered dudleyas are *D. farinosa*, *D. cymosa*, *D. brittonii*, and *D. pulverulenta*.
- *Sedum spathulifolium* is the most available of the stonecrops, with several cultivars, including ones with red-purple leaves and others with silvery gray leaves.
- *Sedella* is not available and few would choose to grow pygmy weed
- The rosecrown is difficult in Bay Area gardens and is also hard to source except for its medicinal components.