# FRUITS: KINDS AND TERMS

THE IMPORTANT PART OF THE LIFE CYCLE OFTEN IGNORED

Technically, fruits are the mature ovaries of plants that contain ripe seeds ready for dispersal

- Of the many kinds of fruits, there are three basic categories:
- Dehiscent fruits that split open to shed their seeds,
- Indehiscent dry fruits that retain their seeds and are often dispersed as though they were the seed, and
- Indehiscent fleshy fruits that turn color and entice animals to eat them, meanwhile allowing the undigested seeds to pass from the animal's gut

We’ll start with dehiscent fruits. The most basic kind, the *follicle*, contains a single chamber and opens by one lengthwise slit. The columbine seed pods, three per flower, are follicles

# A mature columbine follicle

Milkweed seed pods are also large follicles. Here the follicle hasn’t yet opened.

Here is the milkweed follicle opened

The *legume* is a similar seed pod except it opens by two longitudinal slits, one on either side of the fruit. Here you see seeds displayed from a typical legume. Legumes are only found in the pea family Fabaceae.

On this fairy duster legume, you can see the two borders that will later split open.

Redbud legumes are colorful before they dry and open

Lupine legumes twist as they open, projecting the seeds away from the parent

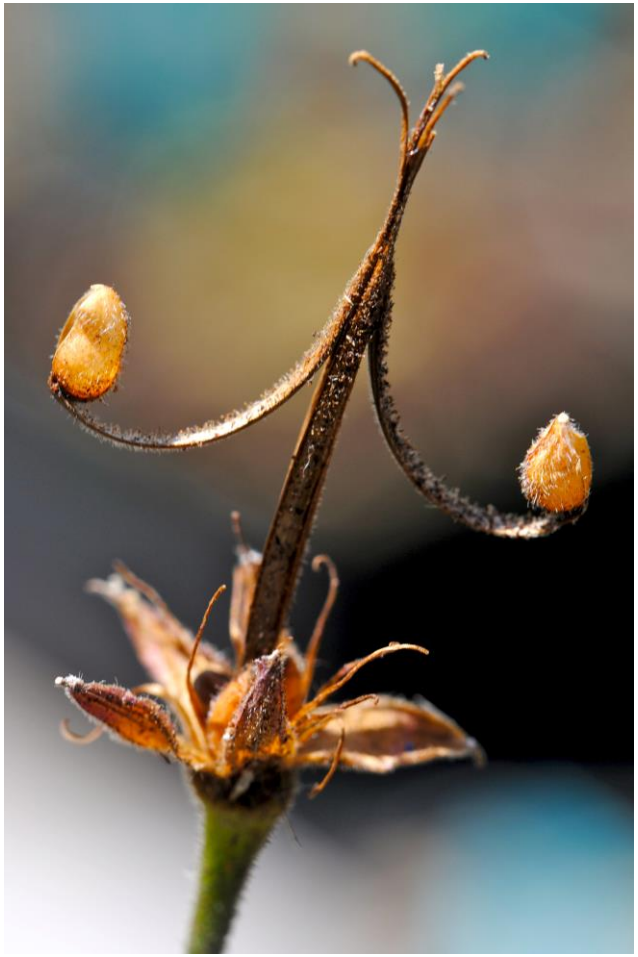
The bur clover modifies its legumes by coiling them and providing them with hooked barbs, only opening later as they dry out.

The rattlepods or astragaluses modify their legumes by inflating them for wind dispersal, later opening to shed their seeds.

The most common dehiscent seed pod is the *capsule*, a two- to many-chambered ovary that splits open into as many segments as the chambers. Here you see the 3-chambered capsule of the prickly poppy.

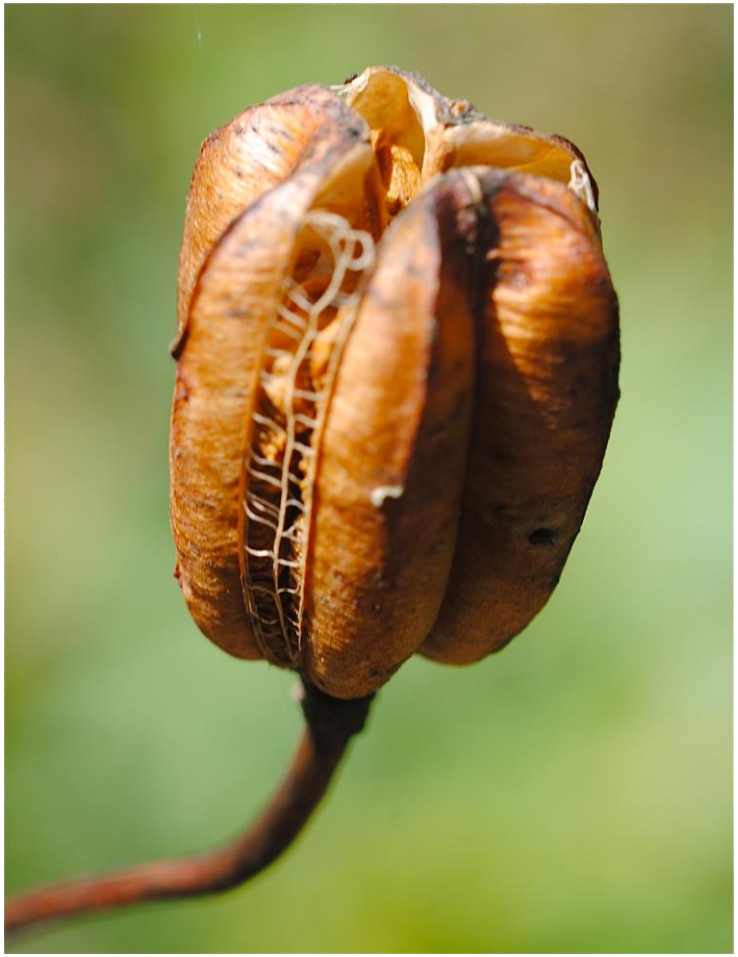
# Fireweed produces 4-chambered capsules full of hairy seeds

Geranium capsules have 5 chambers and the seeds are attached to styles that catapult the seeds away



Some irises offer up 3-chambered capsules with brightly colored seeds

Lilies also have 3-chambered capsules. In this photo one of the chambers is cracking open to expose the seeds inside.



In the mustard family Brassicaceae, there are special seed pods confined to the family. Each contains two chambers and leaves behind a paperlike partition when the ovary and its seeds have fallen. Here you see the broad kind, the *silicle* on lacepod.

Shepherd’s purse is another member of Brassicaceae with a silicle.

Here you see the long slender *siliques* next to the broad *silicles.*

Our next category combines dehiscent and indehiscent fruits. The *schizocarp* consists of a two- to many-chambered ovary, each chamber separating but retaining the seed or seeds inside. The Apiaceae or parsley family has 2-parted schizocarps as seen in this cow parsnip.

Biscuit roots also have 2-parted schizocarps. Note the wings which aid in wind dispersal.

Members of the mallow family Malvaceae produce multi-chambered schizocarps as seen in this weedy mallow

Next, our dry indehiscent fruits. Most of the small ones like the sunflower "seeds", are called *achenes* or ovaries that contain a single seed inside. The whole achene is dispersed. Achenes are typical of the Asteraceae, and often have an attached pappus for dispersal. Here are the achenes of beggar-ticks topped with a pronglike pappus.

Thistle achenes have long hairy pappuses on top.

The especially large achenes of sunflowers store a lot of food. To actually eat the seed, the shell or ovary wall of the achene has to be removed.

Rhubarb achenes are enclosed in winged sepals for wind dispersal.

the many achenes of an anemone flower each bear a long, plumed tail from the style, providing a wind dispersal mechanism

Clematis, like the anemones, uses small achenes with a featherlike style attached for wind dispersal.

Some achenes, like those of maples, bear a wing for wind dispersal. This modified fruit is called a *samara*

Ashes like maples produce samaras, only these only have a single wing, while maples have two

Although birches produce tiny fruits (often mistaken for the actual seeds), these are technically winged samaras

Two important families produce a slightly different version of a single-seeded fruit called a *nutlet*, where the ovary wall is tougher like the shell of a tiny nut. Here you see the young nutlets of hound's tongue in the borage family Boraginaceae.

The mint family Lamiaceae also features nutlets. On this chia, people assume that the sepals are actually a capsule with seeds inside, but the truth is that the sepals surround the tiny one-seeded nutlets

True nuts are relatively uncommon, defined by a hard outer ovary wall forming a shell, usually around a single large, nutrient-rich seed.

- Many nuts like walnuts, almonds, and coconuts are actually *drupes*, because the outer layer of the ovary is fleshy and has to be removed before the “nut” inside can be harvested.

This California hazelnut is a true nut, the outer fuzzy layer is not from the ovary but from bracts around it.

The acorns of oaks, like these of the blue oak, are true nuts, the outer ovary wall forming the shell of the nut.

Our last category, the indehiscent fleshy fruits, is perhaps the most complex. The most basic kind is the *berry*, a 2- to many-chambered fleshy ovary with many seeds

- Surprising fruits qualify as true berries, such as…
- Bananas, papayas, tomatoes, bell peppers, eggplants, and more
- Many so-called berries do not fit our botanical definition such as raspberries, strawberries, blackberries, mulberries, and more

Huckleberries, blueberries, bilberries, and cranberries, all in the genus *Vaccinium* are true berries. Here you see portrayal of a cranberry bog and the fruits of *V. ovatum*, the evergreen huckleberry

All the nightshades in the genus *Solanum* have berries like this weedy black nightshade, *S. nigrum.*

Some members of the lily group, like this fat solomon's seal, *Maianthemum racemosum*, also feature brightly colored berries

Two important variations of the basic berry include the *pepo* in the gourd family Cucurbitaceae. Here the outer ovary wall is hard, not thin as in most berries. These gourds are a good example, but squashes and melons also belong here.

Another variation on the berry is the *hesperidium*, a fruit with a thick outer rind and juice sacs on the inner layer. Most examples of this type belong to the genus *Citrus* including lemons, limes, and oranges.

Another major category of fleshy indehiscent fruits are called *drupes* such as the well-known stonefruits in the genus *Prunus* including peaches, apricots, cherries, and plums. A drupe has a fleshy outer layer and a stony inner layer containing one or few large seeds. Island cherry, *Prunus ilicifolia* is a good example.

Another large group containing drupes are the manzanitas, *Arctostaphylos* spp.

Still another example is the California bay, *Umbellularia californica*

the *pome* named for the apple, is another fleshy fruit, where the hypanthium turns fleshy and envelopes the papery ovary with its seeds. Other pomes include pears and quinces.

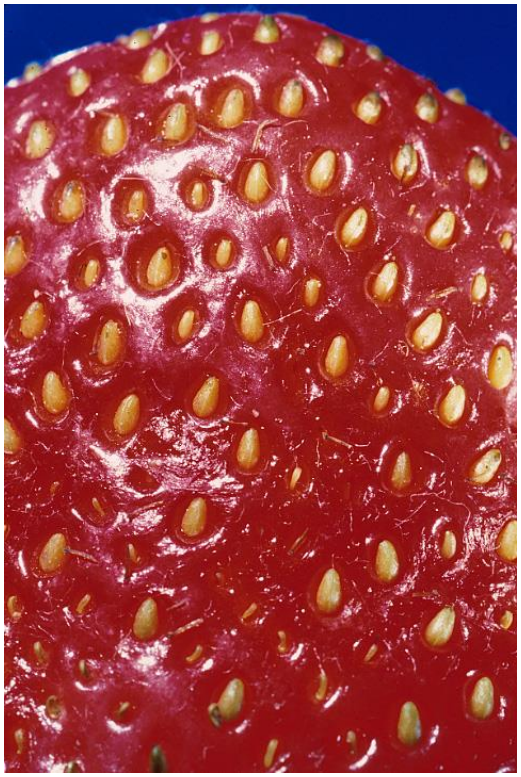
Contrary to common usage, toyon, *Heteroemeles arbutifolia,* bears pomes, not berries

The rose *hip* in the genus *Rosa* is similar to a pome, only in this case a fleshy hypanthium surrounds several hard achenes.

The rose family Rosaceae contains several unusual fleshy fruits. Starting with the genus *Rubus*, we have aggregate fruits, which consist of many ovaries, each a tiny drupelet aggregated together. Here is the thimbleberry

Other aggregate fruits include raspberries and the Himalayan blackberry, *Rubus amerniacus* seen here.

Strawberries, *Fragaria* spp., include the *accessory fruits*, named for their fleshy layer coming from the receptacle, which flows around and engulfs the tiny achenes. On the left, an immature strawberry, on the right a ripe one.



Finally, some fruits are formed from *many* flowers. These are known as *multiple fruits* and include the pineapple. Our native flowering dogwood *Cornus nuttallii* also qualifies.

Figs, genus *Ficus*, represent the most bizarre fruit category of all, the *syconium*, where the fruit consists of a fleshy receptacle on the outside, bearing, numerous tiny achenes on the inside.