

Chapter 9. **Fagaceae: The oak family**

The oak family:

Fagaceae

FAGACEAE (Oak Family)

General physiognomy. Shrubs or trees with simple or pinnately lobed leaves, petal-less catkins of male flowers, and cups or spiny burs containing an acorn or nuts.

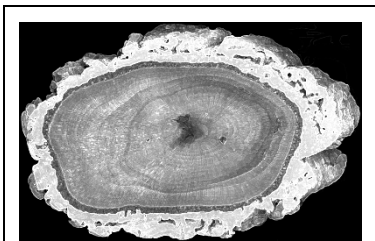
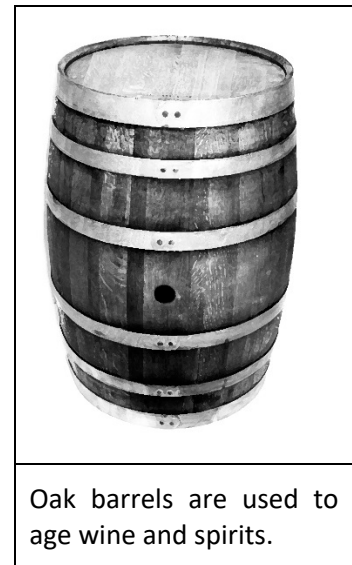
Vegetative morphology. Monoecious, evergreen or deciduous shrubs and trees with alternate, simple, and usually toothed or pinnately lobed leaves.

Reproductive morphology. Flowers unisexual and inconspicuous, small in size and greenish or white in color; male flowers in catkins; female flowers single or in small clusters and found at the base of the male catkins or in axils of the leaves on new shoots. The male flowers have bracts and a few stamens; the female flowers have spiny bracts or sit in a scaly cup with a few sepals and a single pistil with a 3-lobed stigma. The fruits are small nuts enclosed in spiny burs, or acorns that sit in a cup of warty or scale-like bracts.

Taxonomic relationships. Other woody plant families with pendulous (hanging) male catkins include the birch family (Betulaceae). The birches, however, have both male and female catkins and the fruits are tiny winged achenes except for hazelnut, which has a nut enclosed inside a fuzzy husk-like set of bracts.

Biodiversity and distributions. The Fagaceae consist entirely of woody shrubs and trees with over 900 species. The highest diversity is found across the northern hemisphere: The family is represented by seven genera in the Northern Hemisphere and only one in the Southern Hemisphere, the southern beech (*Nothofagus*). Beeches (*Fagus*) and oaks (*Quercus*) occur in both the New and Old World (i.e., America and Eurasia). The southern hemisphere native beech (*Nothofagus*) is a living witness of the ancient southern continent of Gondwana; it is currently found in Chile, Argentina, New Zealand, Australia, the Pacific Islands, and New Guinea.

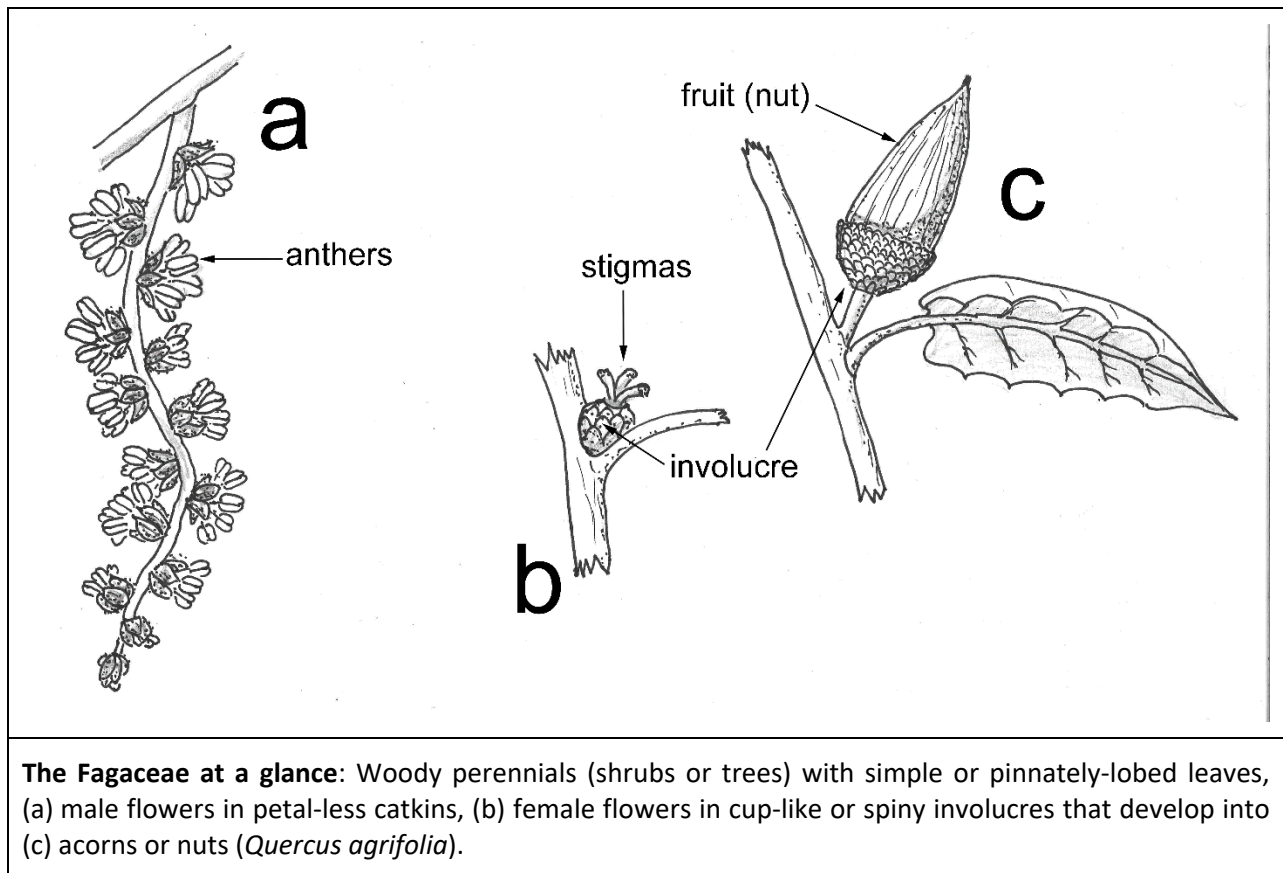
Economic uses and ethnobotany. The family is important for its many imposing trees that dominate woodlands and forests; many are considered keystone species in their habitats. Besides providing many fine shade trees and trees for timber, the chestnuts (*Castanea* spp.) and sometimes the beechnuts (*Fagus* spp.) are used for food. In Europe, in particular, chestnuts are very popular as a winter snack and also to make sweet deserts such as *marron-glacé*. In the temperate Northern Hemisphere, few trees have inspired more poetry, songs, and legends than has the oak. The oak is the national tree of



Cross section of a cork oak, showing the thick, spongy bark.

over of over 15 countries, including the United States, England, Estonia, France, and Germany. It is a central symbol in Greek, Baltic, Celtic, Norse, Slavic, Serbian, and Basque traditions and mythology. It is a symbol of fortitude, strength, perseverance, and safe refuge. Acorns, which normally contain high levels of toxic tannic acid, can be made edible by washing and leaching, and have served as human food for thousands of years in many parts of the world. They were an important traditional component in the diet of many Native Americans, especially in California. Acorns can be readily digested by many wild animals, and support many species of wildlife. In Southern Europe, pigs are

shepherded in open oak grasslands, where they may fatten eating grass, wild herbs, mushrooms, and, especially, acorns. Because they do not eat their own waste, as in a closed sty, their raw ham (in the form of *ibérico* and *prosciutto*) is highly prized as being parasite-free and both safe and healthy to eat. The cork oaks (*Q. suber*), grown in southern Spain, Portugal, and Sardinia, provide valuable raw cork for the ever-increasing demand of the globally growing wine industry. Oak wood is also used to make casks and barrels where wine is aged and whisky is mellowed. The oak is also a preferred wood for furniture and hardwood floors. Many oaks are used in the horticultural trade, including native oaks, as favorite species for long-term, water-efficient landscaping.



The Fagaceae at a glance: Woody perennials (shrubs or trees) with simple or pinnately-lobed leaves, (a) male flowers in petal-less catkins, (b) female flowers in cup-like or spiny involucre that develop into (c) acorns or nuts (*Quercus agrifolia*).

California genera and species. California has three native genera within the Fagaceae: *Chrysolepis* (chinquapin, a close relative of the chestnut, *Castanea*) are shrubs or trees with nuts enclosed in spiny burs. *Lithocarpus densiflorus* (the tanbark-oak) is a tree with large, toothed, evergreen leaves and male catkins in stiff, erect spikes. Finally, *Quercus* (oaks) are shrubs or trees with variable deciduous or evergreen leaves; hanging, yellow male catkins; and acorns formed by nuts borne in scaly cups (nut and cup = acorn). The oaks (*Quercus* spp.) form the most diverse genus in California, with some 20 native species in the state. Oaks in California are commonly divided into two categories: deciduous oaks and evergreen, or “live” oaks. Three live oak species are commonly found in the mountain slopes near or around Riverside County. Recently, the fungal pathogen *Phytophthora ramorum*, commonly known as “sudden oak death”, has caused high mortality rates in different oak species in California.

Quercus dumosa (scrub oak) – The scrub oaks form a complex group, including also *Q. berberidifolia* and *Q. acutidens*, which frequently includes also shrubby hybrids of other species. Their main distinctive trait is the small size and being largely restricted to dry chaparral.



Quercus agrifolia (coast live oak) – This species is common in low and moister slopes in the mountains and hills of our region. As the adjective “live” in its common name suggests, this species is evergreen and does not shed its leaves in winter.



Quercus chrysolepis (canyon live oak) – This often large and majestic oak occurs in canyons and moist slopes in higher elevations in our region, and throughout the peninsular ranges of Southern California and Baja California.

