

# Angiosperm

## I. INTRODUCTION

Angiosperm (Latin *angi-*, "enclosed" Greek *sperma*, "seed"), common name for the division or phylum comprising flowering plants, the dominant form of plant life. Members of the division are the source of most of the food on which humans and other mammals rely and of many raw materials and natural products. Included in the division are most shrubs and herbs, most familiar trees except pines and other conifers, and specialized plants such as succulents, parasites, and aquatic types. Although about 230,000 species are known, many remain obscure. Flowering plants occupy almost every ecological situation and dominate most natural landscapes. About two-thirds occur in the Tropics, where they are rapidly being exterminated by human activities. Only about 1000 species are of major economic importance, and the bulk of the world's food supply is derived from only 15. Many hundreds more could be useful if properly investigated and developed.

## II. DESCRIPTION

The characteristic feature of angiosperms is the flower, the function of which is the reproduction of the plant through the development of seeds. Flowers are highly modified shoots made up of four fundamental parts arranged in separate series, or whorls, on specialized stem tips. The outer series consists of the sepals, which are modified leaves or bracts that are usually green.

The next inner series, the petals, are also modified leaves, but they are usually finer textured and more conspicuously colored. The third series consists of the stamens, the pollen-producing male portion of the flower. The innermost series is the carpels, female structures that produce the seeds. Carpels are often fused into a structure called the pistil.

The seeds of angiosperms develop in an ovary, a part of the carpel that surrounds and protects the egg-containing ovules. Seeds develop from the ovules after pollination and fertilization of the eggs. Ovules and seeds are not exclusive to angiosperms. The "naked-seed" plants (see Gymnosperm), which include the conifers, cycads, and ginkgo, have ovules that lie exposed on the surface of specialized, scalelike leaves arranged into cones. The development of seeds from ovules enclosed in an ovary, which enlarges into a fruit as the fertilized seeds grow, is a feature unique to the angiosperms.

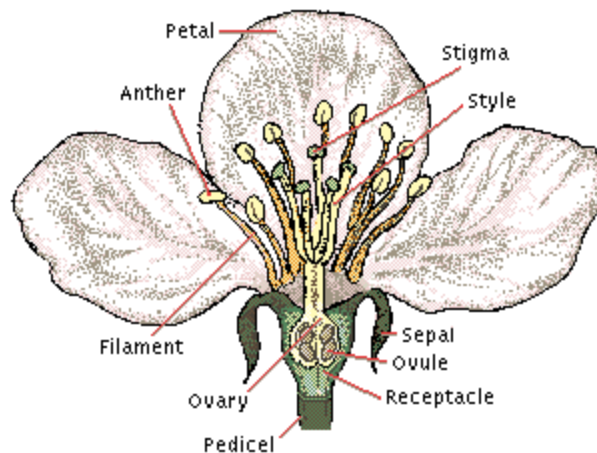
## III. EVOLUTION

The unique angiosperm flower probably evolved from a now extinct gymnosperm group that had insect-pollinated cones combining male and female reproductive parts. Living gymnosperms are mostly wind-pollinated, but among certain fossil and extant groups evidence of insect pollination exists. Although insects facilitate pollination, they also eat ovules, and it is believed

that the development of the ovule-enclosing carpel of the angiosperm was an adaptation to protect the ovules and developing seeds from insect predation. The carpel also provided protection from other harmful environmental influences, such as dryness, and it allowed reduction in the size of the ovule, refinement of the process of pollination, and the development of other parts of the flower, all of which improved the chances of successful reproduction.

**Scientific classification:** Angiosperm is the common name for the division Magnoliophyta. Angiosperms are divided into two classes, the Magnoliopsida and Liliopsida, popularly termed dicots and monocots, representing separate evolutionary lines that must have diverged early in the history of the group. The direct predecessors of angiosperms are thought to have been woody gymnosperms; certain woody groups of dicots (see Magnolia) are thought to be primitive angiosperms. Monocots are more advanced than dicots, and they evolved from a primitive dicot group (see Water Lily).

## Parts of a Flower



All flowers share several basic features. A flower begins growth at the end of a specialized branch known as a peduncle or *pedicel*. This branch enlarges at its tip to form the *receptacle*, the structure to which the other plant parts are attached. *Sepals*, protective coverings that are closed over the bud before it blooms, are the outermost flower parts. One step inward lie the *petals*, which serve to attract pollinators using both coloration and scent-producing glands. Inside the petals are the flower's sexual organs, the stamens and pistil. Each stamen, the pollen producing part of the flower, includes an *anther* and a *filament*. At the center of the flower is the pistil, composed of a *stigma*, a *style*, and an *ovary*. Within the ovary is a small cavity that contains the *ovule*, an egg-shaped structure that, when fertilized, eventually becomes a seed.

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