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Flowering Plants



Authors:

Kerry Woods

Kevin J. Caley

Editor:

Emily Monosson

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Defining Flowering Plants

Flowering plants, or angiosperms—described taxonomically as the division Magnoliophyta—are the largest grouping within the plant kingdom (Kingdom Plantae or Viridiplantae) in terms of the numbers of described species. Approximately 260,000 species of flowering plant have been named so far, constituting nearly 90% of all known species of plants. Even so, taxonomists describe many new species annually, and estimates of total angiosperm diversity reach as high as 400,000 species. There are about 450 families of flowering plants, displaying extremely diverse life histories and ecological adaptations. In addition to dominating plant biodiversity, angiosperms are the dominant photosynthetic organisms (primary producers) in most terrestrial ecosystems (an important exception to this rule are the boreal forests, which are often dominated by conifers). All important food plants are angiosperms.

Natural History

Angiosperms are also the youngest of the plant divisions, having arisen relatively late in the history of terrestrial plant life. The first land plants are about 450 million years old, but the earliest definitive angiosperm fossils are only about 130 million years old, placing their known origins within the Early

Cretaceous period. However, indirect evidence leads some scientists to estimate that angiosperms may have originated as early as 250 million years ago, that is, at the end of the Permian period.

By about 100 million years ago, during the Late Cretaceous period, angiosperms experienced a rapid diversification in form. The factors driving this diversification have long been of interest to evolutionary biologists. Many scientists hypothesize that specialized mutualistic relationships with animal pollinators played an important role in the development of angiosperm diversity (and perhaps insect diversity as well).

Physiological Characteristics and Behavior

Angiosperms are anatomically distinguished from other plant groups by several developmental and anatomical features. They produce flowers, which are very short branches bearing a series of closely spaced leaves modified to facilitate pollination (sepals and petals) or to bear the organs involved in sexual reproduction (stamens and pistils). Developing seeds are completely enclosed in an ovary derived from a portion of the pistil (the word angiosperm is of Greek derivation, meaning covered seed). Ovary tissues mature to form a fruit that is generally involved in protecting the seed and facilitating its dispersal (only angiosperms bear true fruits). Seeds at some point in their development contain a distinctive tissue, the triploid endosperm, which serves as a nutritional reserve for the developing embryo.

Angiosperms That May Interest You

Angiosperms comprise such a large group, it is difficult to single out a mere few of the most intriguing, but here are some of the most important and diverse (and delicious!) flowering plant families.

The composite or daisy family (Asteraceae) has about 24,000 named species, and may be the largest plant family. The orchid family (Orchidaceae) rivals the daisy family in diversity, with about 17,000 species named. The grass family (Poaceae), with over 10,000 species, includes three of the four most productive human-food plants: rice (*Oryza*), wheat (*Triticum*) and maize (*Zea*). The fourth, the potato (*Solanum tuberosum*), is a member of the nightshade family (Solanaceae). The bean (or legume) family (Fabaceae, also known as Papilionaceae) includes about 19,000 species, many of which are important in human food because their symbiotic association with certain nitrogen-fixing bacteria leads to unusually high protein content.

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