

# Gametophyte Encyclopedia Article

## Gametophyte

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# Gametophyte

A gametophyte, or gamete-bearing plant, is one of the two multicellular phases that occur in alternation of generations. The gametophyte is the **haploid** phase; that is, its cells contain only one set of chromosomes, in contrast to the **sporophyte** phase, where the cells contain two sets. The gametophyte develops from the germinating, haploid spore, which was produced by meiosis in the sporangium of the sporophyte phase. Gametophytes produce sperm and egg cells by **mitosis**, often in multicellular **gametangia** known as antheridia and archegonia, respectively. Fertilization, which occurs in the female gametophyte, establishes a new sporophyte generation. In some algae, like sea lettuce, the vegetative gametophyte is identical in form to the vegetative sporophyte, but in most organisms the gametophyte has a very different appearance from the sporophyte. In bryophytes the gametophyte is the highly visible, persistent phase of the plant, but in **vascular** plants the gametophyte is short-lived and often much reduced in size. Among land plants, gametophytes are of four different types. These include: (1) the green, leafy shoot systems of mosses, and leafy liverworts; (2) the green, **thallus** to prothallus forms of thalloid liverworts, hornworts, horsetails, most ferns, and some lycopods; (3) the colorless, subterranean, mycorrhizal axes of psilophytes and some lycopods; and (4) the small, **endosporic** forms of **heterosporous** lycopods, some ferns, and all seed plants. The smallest and least complex gametophytes are those of the flowering plants. The male gametophyte is the two- or three-celled pollen grain that is released from the anther, and the female gametophyte is the seven-celled embryo sac that is located in the base of the pistil of the flower.

Fern prothallia embryo and sporophyte.

## See Also

Bryophytes; Reproduction, Alternation of Generations And; Reproduction, Fertilization And; Reproduction, Sexual; Sporophyte.

## Bibliography

Graham, Linda. "The Origin of the Life Cycle of Land Plants." *American Scientist* 73 (1985):178-186.