Bryophytes

Definition: **bryophyte** from *Philip’s Encyclopedia*

Group of small, green, rootless non-vascular plants (phylum Bryophyta), including moss and liverwort. Bryophytes grow on damp surfaces exposed to light, including rocks and tree bark, almost everywhere from the Arctic to the Antarctic. There are c.24,000 species. See also alternation of generations.

**Summary Article:** **Bryophyta**

from *The Columbia Encyclopedia*

(brīˈəfīˈtə, brĭˈəfīˈtə), division of green land plants that includes the mosses (class Bryopsida), the liverworts (Marchantiopsida), and the hornworts (Anthocerotopsida). The liverworts and hornworts are generally inconspicuous plants; common liverworts include species of the genera *Porella* and *Marchantia*. *Anthoceros* is the most familiar temperate-zone hornwort genus. Bryophytes differ from ferns, cone-bearing plants, and flowering plants in that they lack a vascular system for the transportation of water. Since their cells must absorb water directly from the air or the ground, nearly all bryophytes grow in moist places.

**Bryophyte Generations**

The conspicuous green plant body of a bryophyte is the haploid, or gametophyte, generation of the plant life cycle. It consists of a small stem with leaflike projections, as in all mosses and most liverworts, or a leafless, flattened body (thallus), as in some liverworts and all hornworts. The plant is anchored by means of threadlike structures called rhizoids. The leaflike structures and the rhizoids lack the complex internal anatomy found in the leaves and roots of plants with vascular systems. The gametophyte reproduces sexually, giving rise to a diploid, or sporophyte, generation; the sporophyte is a structure that grows directly out of the gametophyte and is at least partly dependent on the gametophyte for nourishment.

In mosses, germinating spores (haploid) produce a green filamentous structure on the surface, called a protonema, the first stage of the gametophyte. Erect branches arise out of the protonema. After the branches produce rhizoids, the protonema dies. Antheridia (or sperm-producing structures) and archegonia (egg-producing structures) are borne in clusters on the tips of the branches of the gametophytes; these structures are usually microscopic. The different sex organs may be in a single cluster, in separate clusters on the same branch, or on separate branches, depending on the species. In the hornworts, antheridia and archegonia are borne either on the same thallus or, in some species, on separate thalli; the antheridia are borne either singly or in small groups, and the archegonia are borne singly. In the liverworts, the gametophyte may be a thallus or may be leafy; the antheridia and archegonia are borne on special branches that arise from the leafy stem.

**Fertilization and Reproduction**

In all bryophytes fertilization is dependent on water—usually a film of water or the splashing of raindrops—for the transfer of sperm to the egg. Chemical stimuli direct the motile flagellate sperm to the archegonium. The fertilized egg (zygote) grows out of the gametophyte, which is also the source...
of its nourishment. Typically the sporophyte is a slender stalk from 1 to 2 in. (2.5–5 cm) long, with a capsule at the tip; in some species it may be green and manufacture some of its own food. Cells within the capsule undergo meiosis (reduction division) to produce haploid spores. In many mosses the capsule has a lid, the operculum, which is shed, releasing spores. In other bryophytes the mature capsule ruptures in other ways to release spores.

Classification and Importance
The mosses are generally divided into three orders, with the order Bryales most prominent. It is now believed that the bryophytes descended from green algae by way of now extinct ancestors (the Rhyniophyta). The bryophytes are important because they are pioneer plants and soil builders on surfaces lacking other vegetation. Sphagnum moss (order Sphagnales) has been economically important as packing material and as peat.
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