

## MOSSES

Mosses are Bryophytes which are non-vascular plants. The phylum Bryophyta includes three main evolutionary lines:

Mosses—class Bryopsida or Musci

Liverworts—class Hepatopsida or Hepaticae

Hornworts—class Anthocerotopsida or Anthocerotae

Mosses are simple plants with a low growth habit and no roots or flowers. They have a cellulose cell wall, chlorophyll; carry out photosynthesis, store starches, have "stems" and "leaves", but no xylem or phloem. They lack the structures necessary to hold itself upright, therefore has an outward growth pattern. It anchors itself with elongated cells called rhizoids, which absorb water and nutrients by diffusion directly from the base on which they grow or from the air.

Mosses are small in size, ranging from 2 to 20 centimeters. There are over 18,000 species world wide. They have adapted to a variety of climatic conditions—from polar to tropical, desert to rain forest. They are important ecologically because they have the ability to grow in rocky areas. They are one of the first species to move into an area. As the moss dies and decomposes the formation of soil begins. When there is enough soil other species can move into the area. They control soil-erosion by providing surface cover and absorbing water. Mosses are important in maintaining soil moisture and in recycling nutrients in forest vegetation. Some mosses are unusually tolerant of extended periods of dryness and freezing, and, upon the return of moisture, they rapidly resume photosynthesis.

Many small moss-like plants bearing the name "moss" are in fact not related to mosses. The thin green "moss" covering on the moist, shaded side of trees, rocks, and soil is the green alga, Pleurococcus. Irish moss is a red alga. Pond moss is a filamentous algae. Beard moss, Iceland moss, oak moss, and reindeer moss are lichens. Spanish moss is a common name for both lichen and an air plant of the pineapple family. Club moss is an evergreen herb.

The life cycle of moss consists of two stages, or generations, called the sporophyte and the gametophyte. Each generation has a different physical form. The gametophyte plant is free-living, self-supporting, and morphologically different from the sporophyte generation. The gametophyte from houses several developmental stages: the spore, the protonema, and the gametophore, which produces the sex organs. The sporophyte plant is attached to and is more or less dependent on the gametophyte generation for nutrients.

The spores germinate to form a protonema, an extensive, branched system of many celled filaments that are rich in chlorophyll. A "leafy" gametophyte plant grows from buds on the protonemata. The protonemata are generally short-lived. The gametophore becomes attached to the rock surface with rhizoids. Asexual reproduction may occur if there is fragmentation of the protonemata. Sexual reproduction is the only method of reproduction for most mosses. The sporophyte plant develops on the gametophyte. A moss sporophyte consists of the:

Foot—which penetrates the gametophore

Seta—an internal conducting system

Capsule—a terminal sporangium

The saprophyte generation receives all water and most nutrients from the gametophore. They are conducted through the transfer tissue of the foot up the seta to the capsule. The seta is rigid because thick-walled cells surround the conducting strand. The capsule often has special structures that are used for spore dispersal.