

# Mosses may be lowly but they are indeed mighty

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Mosses are the fairyland plants of our woods — resembling tiny trees, miniature ferns, or green pincushions. Mosses are often described as lowly plants — they're short in stature, and primitive in structure compared to other plants. But these small plants are really the mighty mosses, thriving in inhospitable conditions, and having existed on earth longer than other living land plants. Mosses first appeared in the fossil record approximately 400 million years ago, whereas flowering plants evolved a mere 130 million years ago.

## Garden Tales

Mosses are very successful in the niches they occupy, as low-growing plants on rocks, tree trunks and poor soil. They generally do well in acidic, poorly drained soil, and shady moist locations. Some mosses, such as those that grow on top of rocks and walls, can tolerate long dry periods that alternate with wet periods. Mosses can't grow tall because they have no vascular tissue, the specialized water- and sugar-conducting xylem and phloem found in the larger land plants (ferns, gymnosperms, and flowering plants). Mosses also lack roots; instead they have thread-like rhizoids.

Gardening with mosses?? Surprisingly, yes! Often, people want to know how to get rid of mosses in their gardens, and the answer generally involves improving soil drainage, decreasing soil acidity, and increasing sunlight. In contrast, there is a developing interest in growing moss gardens, for their beauty and low maintenance. No more mowing! There is even a "moss milkshake" for planting mosses (<http://www.mossacres.com>). And, even more surprising, there is moss graffiti!

A number of moss species are native to our region. Several of these are easy to recognize, like pincushion moss (*Leucobryum*) which grows in whitish-green round mounds, haircap moss (*Polytrichum*) with a hairy cap on its capsule, sphagnum moss (*Sphagnum*) which has distinctive branch clusters and grows in acidic bogs, and water moss with the lovely scientific name of *Fontinalis* which forms long leafy ropes in streams. A good introductory book is "Outstanding Mosses & Liverworts of Pennsylvania & Nearby States" by Susan Munch.

The reproductive cycle of mosses is also unique among land plants, since the familiar leafy moss plant is



Haircap moss (*Polytrichum*) is one of Delaware's lovely mosses.

haploid (has only one of each chromosome), as compared with other land plants which are diploid (have two of each chromosome). In mosses, the diploid stage consists of just a small, stalked, spore-containing capsule (the "sporophyte"), that grows on top of the haploid leafy plant (the "gametophyte"). Mosses have swimming sperm cells.

Traditionally, mosses have been classified as bryophytes, along with their close relatives the liverworts and hornworts. Liverworts are either flat (thallose), or leafy. To distinguish a leafy liverwort from a moss: liverworts often have leaves in two straight rows, with no mid-rib, and edges that are lobed or with fine points.

Mosses have some commercial uses. Gardeners are familiar with peat moss sold in garden stores, and used as a soil amendment for its excellent water-holding properties. Peat moss is partly-decayed Sphagnum moss. Sphagnum moss has also been used as a dressing for wounds, because it is absorptive and bacteria-inhibiting.

When peat moss and other bog plants are compacted for thousands of years, they form peat (turf), which can be burned as fuel. There is concern today about harvesting peat moss in a sustainable fashion, and conserving peatlands.

"A rolling stone gathers no moss", but luckily there are plenty of places where you can enjoy the diversity and subtle beauty of mosses. At this time of year, mosses are very noticeable as bright green patches in our woodlands.

On the campus of Delaware State University, the Claude E. Phillips Herbarium is Delaware's center for research, education, and outreach about plant identifications, locations, and uses. Call 857-6452 (Dr. Susan Yost, Herbarium Educator) to arrange a tour of the herbarium, or for more information about this article.

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