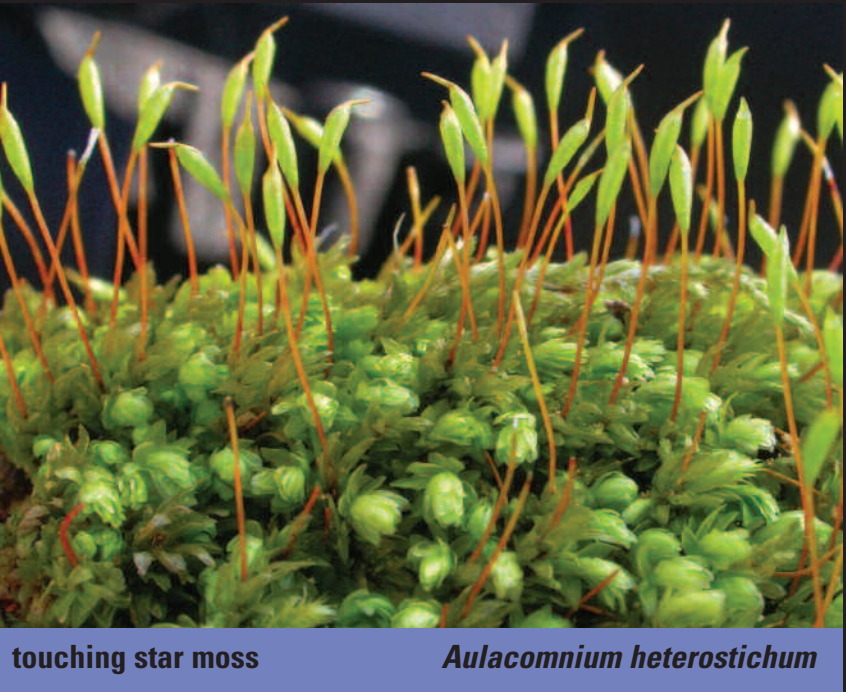




glossy moss *Entodon seductrix*



half sphere liverwort *Reboulia hemisphaerica*



touching star moss *Aulacomnium heterostichum*



juniper moss *Polytrichum juniperinum*

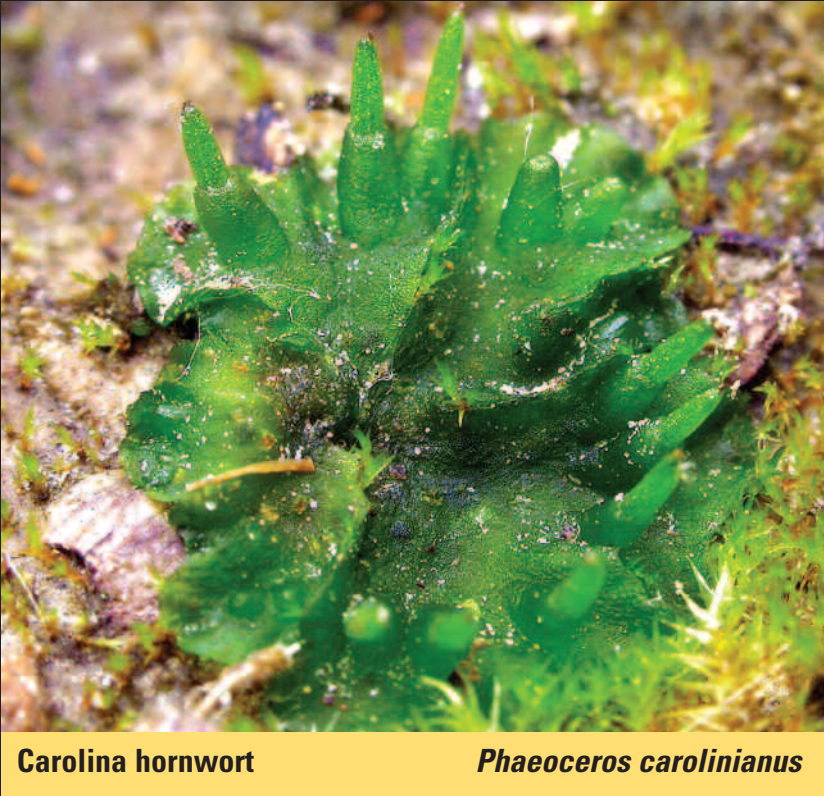


spoon-leaved moss *Bryoandersonia illecebra*



wind blown fork moss *Dicranum scoparium*

Illinois Bryophytes



Carolina hornwort *Phaeoceros carolinianus*



golden thread moss *Ditrichum pallidum*



narrow-leaved Atrichum moss *Atrichum angustatum*



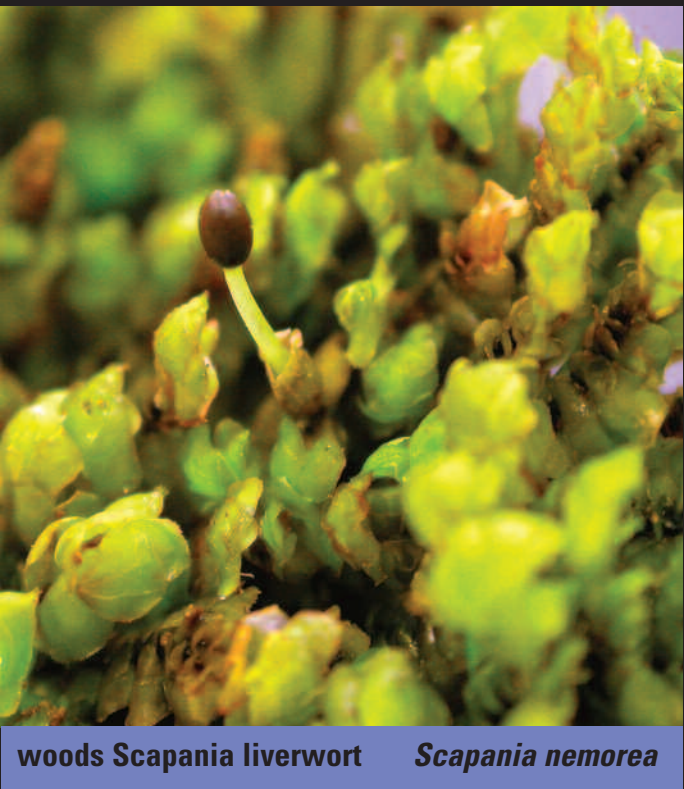
woody Mnium moss *Plagiommium cuspidatum*



greasy liverwort *Aneura pinguis*



common apple moss *Bartramia pomiformis*



woods Scapania liverwort *Scapania nemorea*



scraper liverwort *Radula obconica*



white cushion moss *Leucobryum glaucum*



pear-shaped urn moss *Physcomitrium pyriforme*



hairy Grimmia moss *Grimmia laevigata*



rivulet liverwort *Pellia epiphylla*



great scented liverwort *Conocephalum conicum*



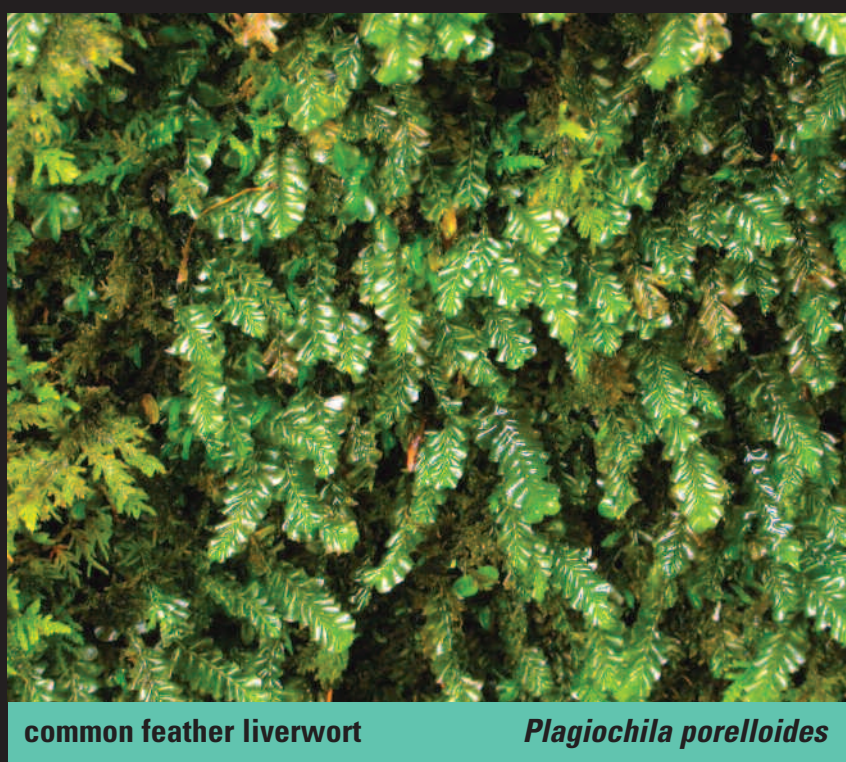
wheat grain moss *Diphyscium foliosum*



woolly liverwort *Trichocolea tomentella*



Bush's flat moss *Fissidens bushii*



common feather liverwort *Plagiochila porelloides*



compact peat moss *Sphagnum compactum*



Alleghany bushy moss *Thamnobryum alleghaniense*

Bryophytes, numbering about 16,000 species in three phyla of the Kingdom Plantae, are second only to flowering plants (about 250,000 species) in the number of plant species known to exist on earth. Mosses (Phylum Bryophyta) are the most abundant of the three bryophyte groups worldwide, with nearly 10,000 species. Liverworts (Phylum Marchantiophyta) account for approximately 6,000 species, and hornwort (Phylum Anthocerotophyta) species number about 200. Illinois' flora includes an excellent array of bryophytes, with approximately 350 species of mosses, 140 species of liverworts and four species of hornworts. Bryophytes are found statewide in Illinois occupying diverse habitats, including disturbed ones, like plowed fields and roadside banks, as well as native woodlands and grasslands. They commonly grow clumped together in mats or cushions on trees, logs, rocks, and soil, and may be submerged in or floating on water. The majority of the state's bryophytes grow in **mesic** woodlands and canyons, where small, specialized environments, known as microhabitats, exist. Most bryophyte species are found in only one microhabitat, although some species are widespread. The 25 species on this poster illustrate both the diversity of Illinois bryophytes and the variety of microhabitats in which they grow. The major conservation concern for bryophytes is loss of microhabitat diversity.

* Text words in **bold** are defined in the glossary.

Species List

Liverworts, mosses, and hornworts are not shown in equal proportion to actual size.

Color Key:

- woodlands
- canyons
- disturbed soil

Kingdom Plantae

Phylum Marchantiophyta

Liverworts

greasy liverwort
great scented liverwort
rivulet liverwort
common feather liverwort
scraper liverwort
half sphere liverwort
woods Scapania
woolly liverwort

Aneura pinguis
Conocephalum conicum
Pellia epiphylla
Plagiochila porelloides
Radula obconica
Reboulia hemisphaerica
Scapania nemorea
Trichocolea tomentella

Phylum Bryophyta

Mosses

narrow-leaved Atrichum
touching star moss
common apple moss
spoon-leaved moss
wind blown fork moss
wheat grain moss
golden thread moss
glossy moss
Bush's flat moss
hairy Grimmia
white cushion moss
pear-shaped urn moss
woody Mnium
juniper moss
compact peat moss
Alleghany bushy moss

Atrichum angustatum
Aulacomnium heterostichum
Bartramia pomiformis
Bryoandersonia illecebra
Dicranum scoparium
Diphyscium foliosum
Ditrichum pallidum
Entodon seductrix
Fissidens bushii
Grimmia laevigata
Leucobryum glaucum
Physcomitrium pyriforme
Plagiommium cuspidatum
Polytrichum juniperinum
Sphagnum compactum
Thamnobryum alleghaniense

Phylum Anthocerotophyta

Hornworts

Carolina hornwort

Phaeoceros carolinianus

This poster made possible by:

Illinois Department of Natural Resources
Division of Education



Text: Raymond E. Stotler, Southern Illinois University, Carbondale
Barbara J. Crandall-Stotler, Southern Illinois University, Carbondale

Photos: ©Zhang Li, Southern Illinois University, Carbondale
©Barbara J. Crandall-Stotler, Southern Illinois University, Carbondale

Anatomy

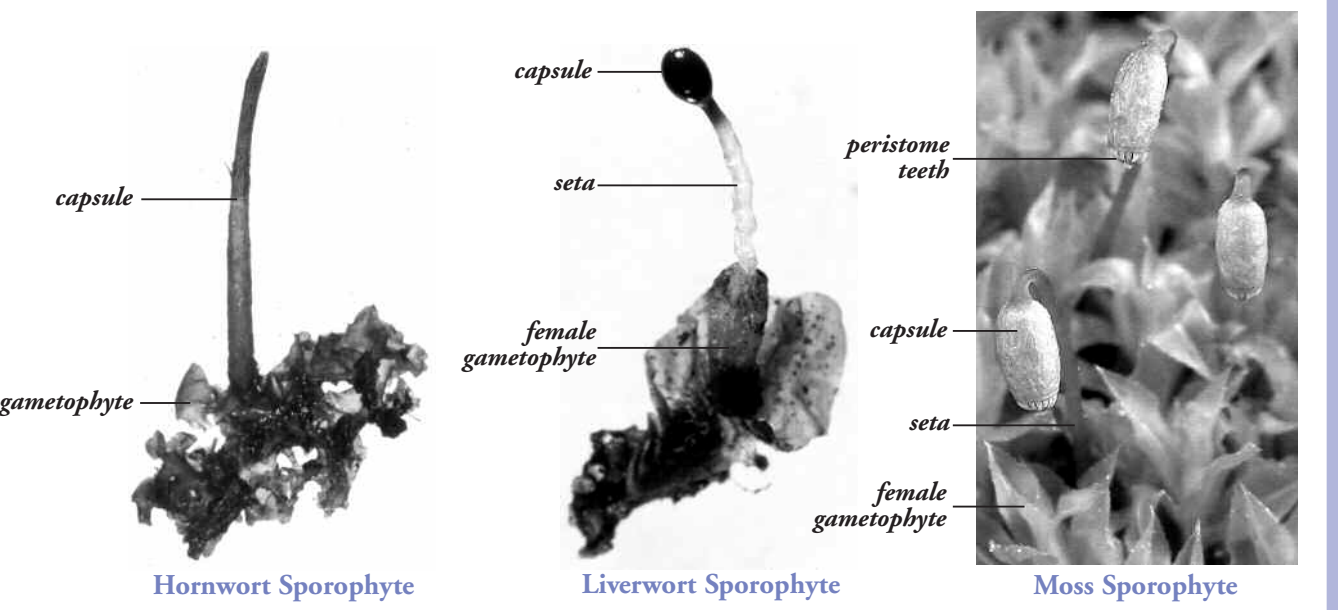
The term “bryophytes” is applied to three structurally different groups of plants that resemble each other primarily in their small size, lack of lignin-containing conducting tissues, and **gametophyte**-dominated life cycles. In mosses, liverworts, and hornworts, the green plant seen growing on logs, rocks, trees, or soil is the **haploid**, sexual phase of the organism. In contrast, the familiar form of ferns and flowering plants is the **diploid**, **spore**-producing phase of the organism.

The gametophytes of all mosses and most liverworts are made up of cylindrical stems with either spirally arranged leaves (mosses) or leaves arranged in two or three rows (liverworts). Mosses often grow erect, while liverworts are typically **prostrate**. With rare exception, mosses are radially symmetric, with leaves evenly spaced all around the stem, while leafy liverworts are bilaterally symmetric and have distinctly different dorsal and ventral surfaces. In mosses, the insertion of the leaves on the stem is transverse, and the leaves are undivided, long, and tapered to a pointed apex. Often, a single central vein, or **costa**, extends from the base of the leaf to the leaf middle or beyond. Liverwort leaves have oblique, longitudinal insertions so they lie flat against the substrate and may be divided into two or more parts, or if undivided, are round. Liverwort leaves never have veins. In mosses, all of the leaves of a shoot are similar in structure, but in liverworts, the two rows of leaves visible from the dorsal side are larger and morphologically different from the smaller, hidden leaves on the ventral side.

Although the majority of bryophytes are small and leafy, in some liverworts and all hornworts the gametophyte is a flattened, ribbonlike **thallus**. The thallus in complex thalloid liverworts is differentiated into a ventral zone of storage tissue and an upper zone of air chambers that open to the outside by elevated pores. These pores give the dorsal surface a roughened appearance. In hornworts and simple thalloid liverworts, air chambers and pores are lacking so the thallus has a smooth texture. Hornworts have distinctive blue-black dots embedded in their thalli containing **symbiotic** colonies of the blue green bacterium, *Nostoc*. Hornworts are also unique among plants in having only one large chloroplast in each thallus cell.

All bryophytes are attached to their substrate by hairlike structures called rhizoids. In mosses, the rhizoids are red-brown and many-celled, while in liverworts and hornworts, they are colorless and one-celled. Even though rhizoids can penetrate the soil, water and minerals are absorbed directly by leaves or thalli from the rain or dew that washes over them. Bryophytes never have roots.

As seen in several photographs on the front of this poster, **sporophytes** frequently emerge from the gametophytes of mosses and hornworts. In mosses, the visible part of the mature sporophyte consists of a firm, brown **seta** that bears a knoblike, brown to tan, spore-producing **capsule** at its tip. Hornwort sporophytes consist of an elongate, often green, horn-shaped capsule that continues to grow from its base while opening by longitudinal tears at its apex. Because they are very ephemeral when mature, liverwort sporophytes are rarely seen, but can be recognized by their fragile white setae and shiny black capsules. In all bryophytes, the sporophyte is attached to the gametophyte by an embedded **foot**. Nutrients move through the foot from the gametophyte to the sporophyte.



Glossary

antheridium	(pl. antheridia) the male sex organ of bryophytes
archegonium	(pl. archegonia) the female sex organ of bryophytes
bog	a wet, peaty area low in nutrients but rich in organic matter
buds	small embryonic leafy shoots that arise from the protonema of a moss
calyptra	tissue derived from the archegonium that surrounds the developing sporophyte of a moss or liverwort; in mosses, this tissue later forms a hood or cap that remains over the developing capsule
capsule	the spore -producing part of the sporophyte plant
costa	a midrib always more than one cell thick
diploid	having two sets of chromosomes per cell
endangered	a species in danger of becoming extinct within all or part of its range
foot	in bryophytes, the basal portion of a sporophyte that is in contact with the gametophyte
gametophyte	the persistent haploid phase of a bryophyte that produces gametes (sperm and egg); the green, leafy, or thalloid plant phase
haploid	having one set of chromosomes per cell
horticultural	related to the branch of science concerned with growing ornamental, orchard, or garden plants
meiosis	a type of cell division in which two successive nuclear divisions reduce chromosome numbers from diploid to haploid
mesic	habitats with ample water to produce a moist environment
peristome teeth	in mosses, toothlike structures at the capsule mouth that disperse spores by their bending movements
photosynthesize	in green plants, carrying on the chemical process that uses sunlight to produce sugar from water and carbon dioxide in the presence of chlorophyll
prostrate	flat; those bryophytes that grow flat on soil, rocks, trees, or logs
protonema	(pl. protonemata) the filamentous stage in the development of a moss from a germinating spore
seta	(pl. setae) the elongate portion of the sporophyte plant phase between the foot and the capsule
spore	a resistant-walled, one-celled structure produced by meiosis in the capsule of a moss, liverwort, or hornwort
sporophyte	the short-lived diploid phase of a bryophyte that produces spores; in bryophytes the sporophyte remains attached to the gametophyte
symbiotic	two different organisms living together
thallus	a flattened gametophyte plant lacking a stem and leaves
threatened	a species likely to become endangered
xerophytic	a plant growing in a very dry habitat

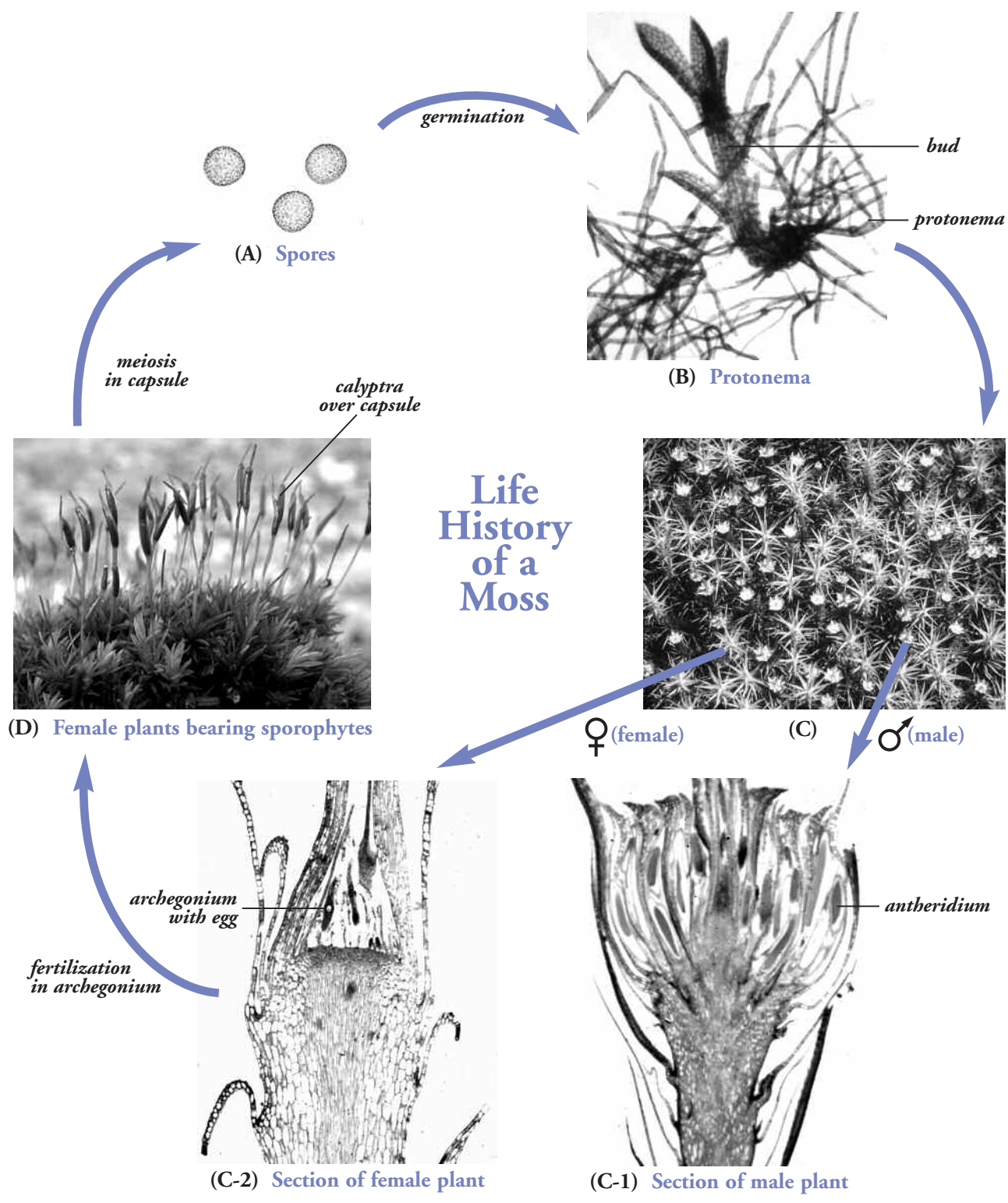
Habitats & Conservation

Bryophytes grow in practically every kind of habitat with the exception of hot springs and oceans. They flourish particularly well in moist, humid forests. Their ecological roles are many. They provide seed beds for larger plants, they capture and recycle nutrients that are washed by rain from the canopy, and they bind the soil to keep it from eroding. In Illinois, some species are aquatic, growing partially submerged in **bogs** or floating in swamps. At the other extreme are **xerophytic** species that grow exposed to sunlight on open soil or bluff tops, where it is very dry and hot through much of the growing season. The greatest diversity of mosses in Illinois is found in woodlands, especially mid-slope to upland sites where they occur on exposed soil, rocks, logs, and tree trunks. Most liverworts, in contrast, require a more **mesic** habitat and are found on shaded soil, rocks, logs, and tree bases in bottomland woods, ravines, and in canyons where water seeps through the rocks. Hornworts in Illinois are most commonly found growing on disturbed, compacted soil, such as in farm fields before they are plowed in the spring or along the edge of dirt paths in forests. In autumn, hornworts and thalloid liverworts may be found in draw-down areas where the water has receded along river banks, lake shores, and streams banks.

Because so few biologists study these plants, very small amounts of data have been collected to apply to decisions regarding bryophyte conservation in Illinois. As of 2006, no bryophytes have been listed as either **endangered** or **threatened** in our state. As with all organisms though, the preservation of a variety of natural habitats is necessary to conserve the diverse communities of organisms, including bryophytes, that occupy them.

Life History

Bryophytes begin their life cycle with the germination of small, one-celled **spores** (A) that have been dispersed from the **capsule** of a **sporophyte**. The spores are produced by **meiosis** and are **haploid**, meaning they contain only one set of chromosomes in their nuclei. During germination, the protective wall of the spore breaks, and the **protonema** or juvenile phase of the **gametophyte** is formed. In mosses, for example, the protonema consists of a system of filaments (B). This fuzzy, green phase grows over the substrate, sometimes spreading for several centimeters before forming young leafy shoots or **buds**. Numerous buds can be formed from a single protonema, and a whole cushion of moss gametophytes may have developed from a single spore. In order for sexual reproduction to occur, however, the population must contain plants arising from more than one spore. Most bryophytes are unisexual, meaning they bear male and female reproductive organs on separate plants. The **antheridia**, or male sex organs, may be brightly colored and visible at the tips of the male moss plant, while the **archegonia**, or female sex organs, are hidden by the surrounding leaves at the tips of the female plants (C). After the release of sperm from the antheridia (C-1), rain drops hitting the tops of the male plants splash sperm to the female plants. The sperm swim into the base of the archegonium (C-2), where one sperm will fuse with the egg. The **diploid** embryonic sporophyte begins its development from the fertilized egg while still surrounded by the archegonium. During early stages of sporophyte growth, cells of the surrounding gametophyte also divide and a zone of nutrient transfer is formed between the female gametophyte and the sporophyte **foot**. With further growth in mosses, the **seta** and developing capsule of the sporophyte project out of the gametophyte (D). A small remnant of the torn archegonium, called the **calyptra**, continues to cover the capsule until the spores are mature. As meiosis occurs in the spore-producing chambers of the capsule, the apex of the capsule matures to form one or two rings of **peristome teeth** that will be used to disperse the spores. As the capsule expands, the calyptra falls off. With continued drying, a small cap that covers the peristome teeth pops off, and the teeth bend out from the spore chamber, throwing the spores into the wind. If the spores land in a suitable habitat, germination occurs and a new life cycle is begun. The life histories of liverworts and hornworts are generally similar to that of the mosses but with quite different gametophyte and sporophyte anatomies.



Bryophyte Facts

- Liverworts are the most ancient phylum of green plants, being the first to have colonized terrestrial habitats on earth. The term “wort” comes from the Old English word *wort* meaning “plant.” The term “liverwort” was developed in ancient times because plants of *Conocephalum* were thought to resemble the lobes of a liver.
- Liverworts and mosses can be found on all continents, including Antarctica.
- In Illinois, most mosses and liverworts are perennial and are able to **photosynthesize** and grow even during the harsh winter months, whereas hornworts are annual plants that are usually found only from April to October.
- The moss *Polytrichum* is the largest bryophyte in Illinois, commonly reaching 10 to 15 cm (4 to 6 inches) in height. It is related to the tallest moss known, the New Zealand genus *Dawsonia*, which can attain a height of 50 cm (about 20 inches).
- The liverwort *Cephalozia* is the smallest bryophyte in Illinois, being only about 1.5 mm (0.06 inches) wide and less than 10 mm (0.39 inches) long. Most species of this genus are **xerophytic**, growing on highly exposed, barren soil along paths or on thin soil over rocks.
- Some birds, like the black-capped chickadee (*Parus atricapillus*) and eastern phoebe (*Sayornis phoebe*), routinely use mosses to line their nest. This activity contributes to the widespread distribution of some moss species.
- Because bryophytes absorb mineral nutrients from the water that washes over them, the carpet of bryophytes on the forest floor is critical in capturing and releasing nutrients to the other plants of the forest.
- The saying “mosses always grow on the north side of a tree” is not true. In deeply shaded woodlands, mosses can grow completely around a tree trunk, especially near its base.
- *Sphagnum* plants can absorb from 16 to 26 times as much water as their dry weight. For example, a one-pound sample of dried *Sphagnum* will weigh as much as 25 pounds after being soaked in water. This amazing capacity to absorb moisture and its mild antiseptic properties led to the widespread use of *Sphagnum* as a surgical dressing during World War I, a use that is currently being re-investigated by the pharmaceutical industry. Peat moss, the commercial name for *Sphagnum*, is also sold as a **horticultural** soil additive or a liner in hanging baskets of flowers.
- Liverworts produce a vast array of chemical compounds, many of which have been scientifically shown to inhibit the growth of bacteria and tumor cells.
- Mosses were often used in the 18th century to stuff mattresses and pillows. In fact, one moss often used for this purpose was named *Hypnum*, a derivation of the Greek word for “sleep.”
- Moss gardens established thousands of years ago in the Zen temples of Japan are still maintained as a major tourist attraction.

Bibliography

Conard, H. S. and P. L. Redfearn, Jr. 1979. *How to know the mosses and liverworts*. William C. Brown Co., Dubuque, Iowa. 302 pp.

Schenk, G. 1997. *Moss gardening, including lichens, liverworts, and other miniatures*. Timber Press, Portland, Oregon. 261 pp.

Crum, H. 1992. *A focus on peatlands and peat mosses*. The University of Michigan Press, Ann Arbor, Michigan. 306 pp.

Glime, J. M. 1993. *The elfin world of mosses and liverworts of Michigan's upper peninsula and Isle Royale*. Isle Royale Natural History Association, Houghton, Michigan. 148 pp.

McKnight, B. N. 1987. *The bryophytes of Illinois; an annotated and indexed bibliography and checklist*. Illinois Natural History Survey, Urbana, Illinois. Biological Notes No. 127. 41 pp.

Stotler, R. E. 1979. *A history of Illinois bryology*. Transactions of the Illinois State Academy of Science 72: 16-27.

Thomas, L. P. and J. R. Jackson. 1985. *Walk softly upon the earth. A pictorial field guide to Missouri mosses, liverworts and lichens*. Missouri Department of Conservation, Jefferson City, Missouri. 129 pp.

WEB SITE
Southern Illinois University. 2006. <http://bryophytes.plant.siu.edu/>
Bryophytes Web page.
Southern Illinois University, Carbondale.

Common Illinois Species

Liverworts
greasy liverwort *Ancura pinguis* - Greasy dark green best describes the color of this simple thalloid liverwort that inhabits very wet decaying logs in swamps and bottomlands. Specialized lateral branches that bear the **antheridia** and **archegonia** commonly occur on this plant.

great scented liverwort *Conocephalum conicum* - The surface of this plant has a scaly appearance unique among Illinois liverworts. *Conocephalum*, our largest liverwort, occurs on very moist rocks or soil. Crushing a piece of **thallus** will release a distinctive cinnamon aroma.

rivulet liverwort *Pellia epiphylla* - Carpets of ribbonlike *Pellia* thalli may cover large expanses of moist rock. In spring, rounded **capsules** at the tips of delicate white **setae** are projected two to three inches upward for **spore** release. The entire process lasts only a few days, after which the **sporophytes** shrivel and vanish, leaving only the thalli until the routine is repeated the following year.

common feather liverwort *Plagiobolus poroloides* - Plants of this leafy liverwort sheet downward, forming large mats over wet rocks or the base of trees in swamps or moist bottomland woods. The leaves are in two rows along the stem, but instead of being flattened, each leaf is in-rolled, giving a unique appearance to this genus.

scraper liverwort *Radula obconica* - Two lateral rows of very small, round leaves characterize this liverwort. It commonly grows in flat, yellow-green mats on moist, vertical rock.

half sphere liverwort *Reboulia hemisphaerica* - Green thalli bearing a red tinge along the margin and minute white dots over the surface characterize *Reboulia*. This liverwort is common on woodland soil throughout Illinois. It is more visible in spring, when long specialized branches called archegoniophores project an inch or more above the thallus. Each of these branches bears up to six dark brown, spore-bearing capsules that project from beneath the disc of tissue at its top.

woods Scapania *Scapania nemorea* - In spring, oblong spore capsules may be found at the top of a white stalk pushing up from leaflike protective tubes in *Scapania*. The leaves of this genus are yellow-green but often red-tinged. Woods *Scapania* commonly forms small mats on exposed soil throughout Illinois.

woolly liverwort *Trichocolea tomentella* - This species is Illinois' largest leafy liverwort. The very finely divided leaves impart a woolly appearance to the plant. Mats of *Trichocolea* are common in wet swampy areas or in protected wet pockets in rock outcrops.

Mosses
narrow-leaved Atrichum *Atrichum angustatum* - Probably the most common woodland moss of Illinois, this species grows in large clumps on disturbed soil in upland woods but may also be found in parks and lawns. It produces capsules in great abundance. When the plants dry, the leaves curl and twist towards the stem, helping to conserve water, uncurling again when wet.

touching star moss *Aulaacomnium heterostichum* - Large carpets of this moss can be found on moist, shaded soil of steep banks along stream beds. It is also common on vertical, exposed soil in deep erosion cuts in woodlands. The leaves are quite broad, and the leaf tips develop coarse teeth that look like a miniature saw blade.

common apple moss *Bartramia pomiformis* - This common moss forms soft, pale-green cushions on moist, thin soil over rock ledges where there is shade and water seepage. The leaves are long, narrow, and curved or twisted. Capsules, produced in spring, are perfectly spherical. When ready to release spores, they turn red-brown, resembling miniature apples. After releasing spores and drying, the capsules become wrinkled, like dried apples.

spoon-leaved moss *Bryoandersonia illecebra* - This showy moss often becomes golden bronze when it grows in habitats with bright sunlight. It is a large moss that forms extensive mats on moist soil in upland woods. It frequently occurs in ravines and along stream banks. Each plant is rounded and wormlike in appearance, and each leaf tip ends abruptly in a short, twisted point.

wind blown fork moss *Dicranum scoparium* - The striking leaves of this moss tend to bend or curve in the same direction, a feature that prompted the common name “wind blown.” Extremely large, dense tufts of these plants can be found in woodlands throughout Illinois. It is a common companion of *Polytrichum*, *Bryoandersonia*, *Leucobryum* and even *Sphagnum* in hanging **bog** areas.

wheat grain moss *Diphyscium foliosum* - This moss is common on moist soil banks along erosion cuts in woods. It has very small tongue-shaped leaves that are often green to almost purple. The capsules are unusual because they are stalkless, and when mature they resemble a grain of wheat surrounded by long, hairlike leaves. Three immature capsules are visible in the photo.

golden thread moss *Ditricum pallidum* - Small tufts of this pale, yellow-green moss grow on dry soil in wooded areas statewide. Tufts are usually about the diameter of a silver dollar. This distinctive moss has long, narrow erect leaves. When capsules are produced, in late winter to early spring, it becomes difficult to actually see the leafy plants. The long yellow setae with small, erect capsules then are diagnostic.

glossy moss *Entodon seductrix* - Mats of this yellow-green to golden-brown moss can cover the spreading roots at the base of very old, large trees. It can also grow on the bark of logs remaining from trees that have fallen during storms.

Bush's flat moss *Fissidens bushii* - This moss is common throughout Illinois, occurring on moist soil or rocks in exposed woodland habitats. The leaves are attached to the stem at about a 45-70° angle and are in two rows giving a flattened appearance, a trait unique to the genus *Fissidens*.

hairy Grimmia *Grimmia laevigata* - Small cushions of this perennial pioneer moss grow attached to rock and collect wind-blown dust particles over the years. As the older parts of the cushions die they add organic matter to mineral dust, gradually forming a thin soil layer. In time, enough soil can be produced to allow grass seeds to grow, and the cycle continues with more soil being produced. *Grimmia* cushions are generally dark black-brown when dry and dark green when wet. Each leaf ends in a long, white hairlike tip.

white cushion moss *Leucobryum glaucum* - Cushions of this common moss occur in woodlands throughout Illinois. Plants are green when moist (as seen in this poster) but become nearly white when they are completely dry. The name *Leucobryum*, means “white moss.” Large cushions of this moss, a foot or more in diameter, are not uncommon.

pear-shaped urn moss *Physcomitrium pyriforme* - This moss forms small tufts on exposed soil in yards, garden plots, and other open, sunny habitats in spring. The erect capsules are shaped like upside-down pears on red stalks, becoming urn-shaped cups after they have opened and dispersed their spores.

woody Mnium *Plagiommium cuspidatum* - Mats and turfs of this very common moss may cover large areas of exposed soil in upland woods and on lawns where soil is compacted and shaded. Capsules are nodding and point downward. Vegetative stems grow creeping across the soil in a chainlike fashion, but upright sexual branches develop when male and female reproductive structures are formed.

juniper moss *Polytrichum juniperinum* - Tufts of this moss often grow on exposed to partially shaded soil and are distinguished from other species of the genus by the red leaf tips. Because the leaves of this species somewhat resemble the scalelike leaves of a juniper tree, it is commonly known as the “juniper moss.”

compact peat moss *Sphagnum compactum* - While most species of *Sphagnum* are commonly associated with bogs and swamps, some form “hanging bogs,” which occur frequently in the canyons of southern Illinois. These hanging bogs are large populations of *Sphagnum compactum* growing in wet seep areas on bluff tops, often hanging over the bluff edge. In the bogs of northeastern Illinois, species of *Sphagnum* sometimes form a floating mat over the water.

Alleghany bushy moss *Thamnobryum alleghaniense* - Turfs of this moss, characterized with drooping branches clustered at the tip of an upright stem, resemble tiny trees in a miniature forest. *Thamnobryum alleghaniense* is common on moist rock in wet, shady gorges and ravines, mostly in southern Illinois.

Hornwort
Carolina hornwort *Phaerosorus carolinianus* - Hornwort thalli grow in circumference to nearly the size of a quarter. Capsules mature into hornlike projections, one to two inches long. Compact soil along paths and trails in Illinois woodlands in spring and river banks exposed by receding water in fall are habitats for these plants.

Resources

More information about bryophytes and other plants is available from the developers of this poster. The Illinois Department of Natural Resources' (IDNR) Division of Education provides materials and programs on a variety of topics, including plants. The *Biodiversity of Illinois* series of CD-ROMs from the IDNR Division of Education includes images and life history information about many plant species found in the state. The CD-ROMs are available to teachers by written request on school letterhead. Mail request to the address listed below. The CD-ROMs may also be borrowed from lending locations throughout Illinois. For a list of lending locations, go to <http://dnr.state.il.us> then click on the “Education” button in the right side bar. Many additional resources may be accessed through the IDNR online order form for educational materials (<http://dnr.state.il.us/lands/education/classrm/edcats02.htm>).

Illinois Department of Natural Resources
Division of Education
One Natural Resources Way
Springfield, IL 62702-1271
217-524-4126
dnr.teachkids@illinois.gov
<http://dnr.state.il.us>

Equal opportunity to participate in programs of the Illinois Department of Natural Resources (IDNR) and those funded by the U.S. Fish and Wildlife Service and other agencies is available to all individuals regardless of race, sex, national origin, disability, age, religion or other non-merit factors. If you believe you have been discriminated against, contact the funding source's civil rights office and/or the Equal Employment Opportunity Officer, IDNR, One Natural Resources Way, Springfield, IL 62702-1271; 217/785-0067; TTY 217/782-9175. This information may be provided in an alternative format if required. Contact the DNR Clearinghouse at 217/782-7498 for assistance.