Seedless Plants

Section 23-2

Nonvascular Plants

Key Idea: Nonvascular plants are small plants that reproduce by means of spores. They lack true roots, stems, and leaves, which are complex structures that contain vascular, or conducting, tissues.

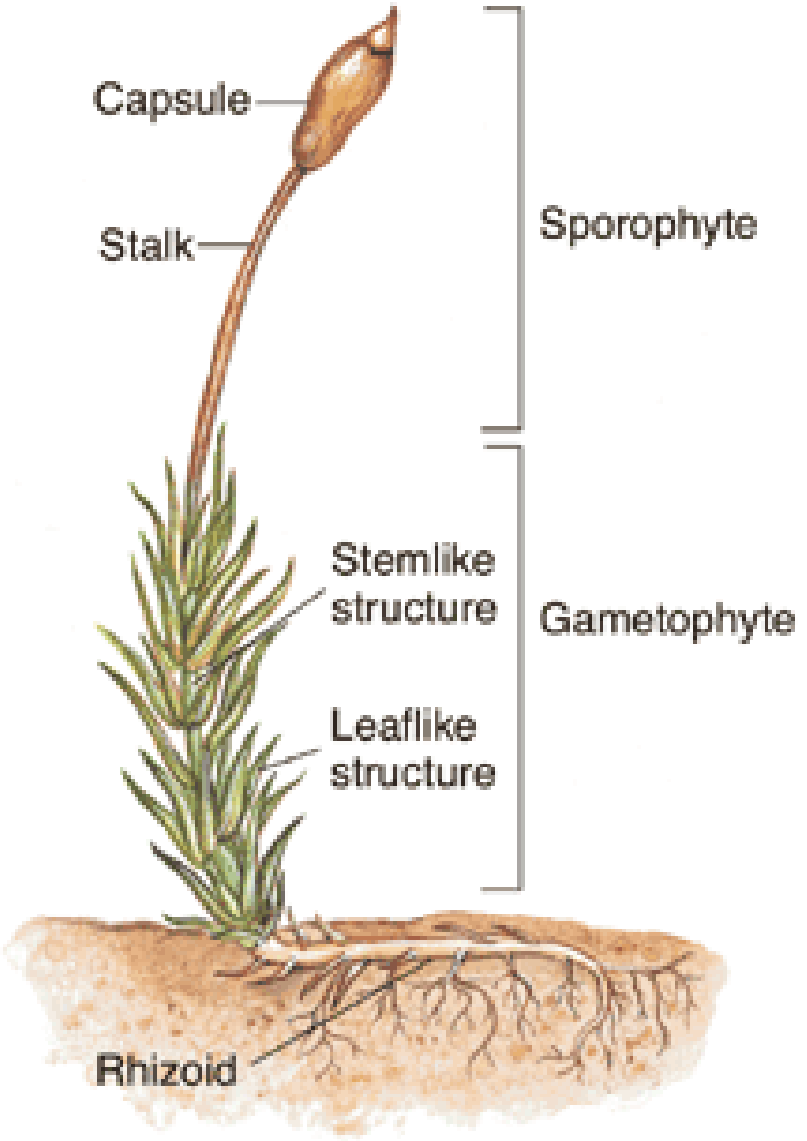
The word consist means to be made up of.

Nonvascular Plants

- Mosses, liverworts, and hornworts are examples of seedless plants called *nonvascular plants*.
- Water and nutrients are transported by osmosis and diffusion.
- All nonvascular plants are relatively small.

Mosses

- The leafy green plants that you recognize as mosses are gametophytes.
- Moss sporophytes, which are not green, grow from the tip of a gametophyte.
- Mosses have a cuticle, stomata and simple conducting cells.



Liverworts

- Liverworts grow in mats of many individual plants.
- There are no conducting cells, no cuticle, and no stomata.
- Structures that resemble stems and leaves make up the gametophytes of most liverworts.
- The sporophytes of liverworts are very small and consist of a short stalk topped by a spore capsule.

Hornworts

- Small groups of nonvascular plants that, like the liverworts, completely lack conducting cells.
- Sporophyte has both stomata and cuticle.
- Gametophyte is green and flattened.
- Green hornlike sporophytes grow upward from the gametophyte.

Reproduction in Nonvascular Plants

Key Idea: In the life cycle of nonvascular plants, the gametophyte is the dominant generation. Gametophytes must be covered by a film of water in order for fertilization to occur.

- An archegonium is a structure that produces eggs.
- An antheridium is a structure that produces sperm.
- A sporangium is a sporophyte that produce spores.

Life Cycle of a Moss

- A moss sporophyte grows from a gametophyte.
- Spores form by meiosis inside the spore capsule.
- Spore are haploid and when the case opens up are carried away by the wind or water.
- It germinates when it settles on the ground and grows into a leafy-looking green gametophyte.

- Archegonia and antheridia form at the tips of the haploid gametophytes.
- Eggs and sperm form by mitosis inside the archegonia and antheridia.
- Sperm swim to nearby archegonia and fertilize the eggs inside of them.

Seedless Vascular Plants

- Key Idea: Sporophytes of seedless vascular plants have vascular tissue, but gametophytes lack vascular tissue. Because of their vascular system, vascular plants grow much larger that nonvascular plants and also develop true roots, stems, and leaves.
- A rhizome is a horizontal, underground stem.
- A frond is the leaf of a fern.

Club Mosses

- The club mosses have roots, stems, and leaves.
- Their leafy green stems branch from an underground rhizome.
- Sometimes known as *ground pines*.
- The tips of the stems contain conelike structures.

Ferns and Fern Allies

- The most common seedless vascular plants.
- Most abundant in the tropics.
- Most fern sporophytes have a rhizome that is anchored by roots and have leaves called **fronds.** The coiled young leaves of a fern are called *fiddleheads*.

- Horsetails are related to ferns. They have hollow vertical stems with joints and whorls of scalelike leaves that grow at the joints.

Reproduction in Seedless Vascular Plants

Key Idea: Like nonvascular plants, seedless vascular plants can reproduce sexually only when a film of water covers the gametophyte. Unlike nonvascular plants, seedless vascular plants have sporophytes that are much larger then their gamtophytes.

A sorus is a cluster of sporangia.

Reproduction In Seedless Vascular Plants