9.19: Life Cycle of Nonvascular Plants

Haploid or diploid. Which would you say is dominant?

That may depend on the plant. Start with moss. The typical nonvascular plant. But such a simple plant has a very interesting life cycle. Whereas most kinds of plants have two sets of chromosomes in their vegetative cells, mosses have only a single set of chromosomes. So, how does meiosis occur?

Life Cycle of Nonvascular Plants

Nonvascular plants include mosses, liverworts, and hornworts. They are the only plants with a life cycle in which the gametophyte generation is dominant. Figure below shows the life cycle of moss. The familiar, green, photosynthetic
moss plants are **gametophytes**. The **sporophyte** generation is very small and dependent on the gametophyte plant.

Like other bryophytes, moss plants spend most of their life cycle as gametophytes. Find the sporophyte in the diagram. Do you see how it is growing on the gametophyte plant?

The gametophytes of nonvascular plants have distinct male or female reproductive organs (see Figure below). Male reproductive organs, called **antheridia** (singular, antheridium), produce motile sperm with two flagella. Female reproductive organs, called **archegonia** (singular, archegonium), produce eggs.

The reproductive organs of bryophytes like this liverwort are male antheridia and female archegonia.

In order for fertilization to occur, sperm must swim in a drop of **water** from an antheridium to an egg in an archegonium. If fertilization takes place, it results in a **zygote** that develops into a tiny sporophyte on the parent gametophyte plant. The sporophyte produces haploid **spores**, and these develop into the next generation of gametophyte plants. Then the cycle repeats.
Summary

- In nonvascular plants, the gametophyte generation is dominant. The tiny sporophyte grows on the gametophyte plant.

Review

1. Describe antheridia and archegonia and their functions.
2. Create your own cycle diagram to represent the moss life cycle.