SECTION 2 Enrichment

From Ocean to Land

Liverworts are small, rootless plants with thin, green leaves shaped like tiny livers. Recently, scientists found that ancient liverworts were the first multicellular organisms on Earth some 470 million years ago. Scientists are calling the 0.04 mm-high plants "trailblazers" since they started the colonization of Earth, leading other plants and animals.

Precambrian Explosion

More than three billion years ago, the oceans were full of one-celled organisms and the land was bare except for a few microbes. Then, about 600 million years ago, the Precambrian Explosion created multicellular plants and animals that lived in the ocean. It seems that the time was right for plants to make the move to shore.

For a long time, scientists believed that liverworts or mosses were the first plants to make their way to land. They thought this because both are simple, primitive, rootless plants. But, with almost no fossil evidence, scientists had to find something else to back up their theory. So they studied the DNA of more than 350 types of modern plants. They were looking for introns, or pieces of genetic information. Specifically, scientists concentrated on trying to find three ancient introns.

First on Land?

Scientists found the introns in all of the plants that they studied, except liverworts. Only the liverworts lacked the three introns. They also found that the three introns also are missing from aquatic green algae, too. That means the land plant (liverwort) and the ocean plant (green algae) are very closely related. Because of that link, scientists now believe that liverworts were probably the first water plants to come ashore.

Of course, scientists don't yet know exactly which of the more than 8,000 species of liverworts was responsible for making the move from ocean to land.

1. How did scientists find the link between land and water plants?

2. How do you think modern-day plants got the introns that are missing in liverworts and green algae?

3. Why do you think plants, rather than animals, were the first to live on land?

4. How do you think scientists can find out which of the thousands of species of liverworts became the first land dwellers?