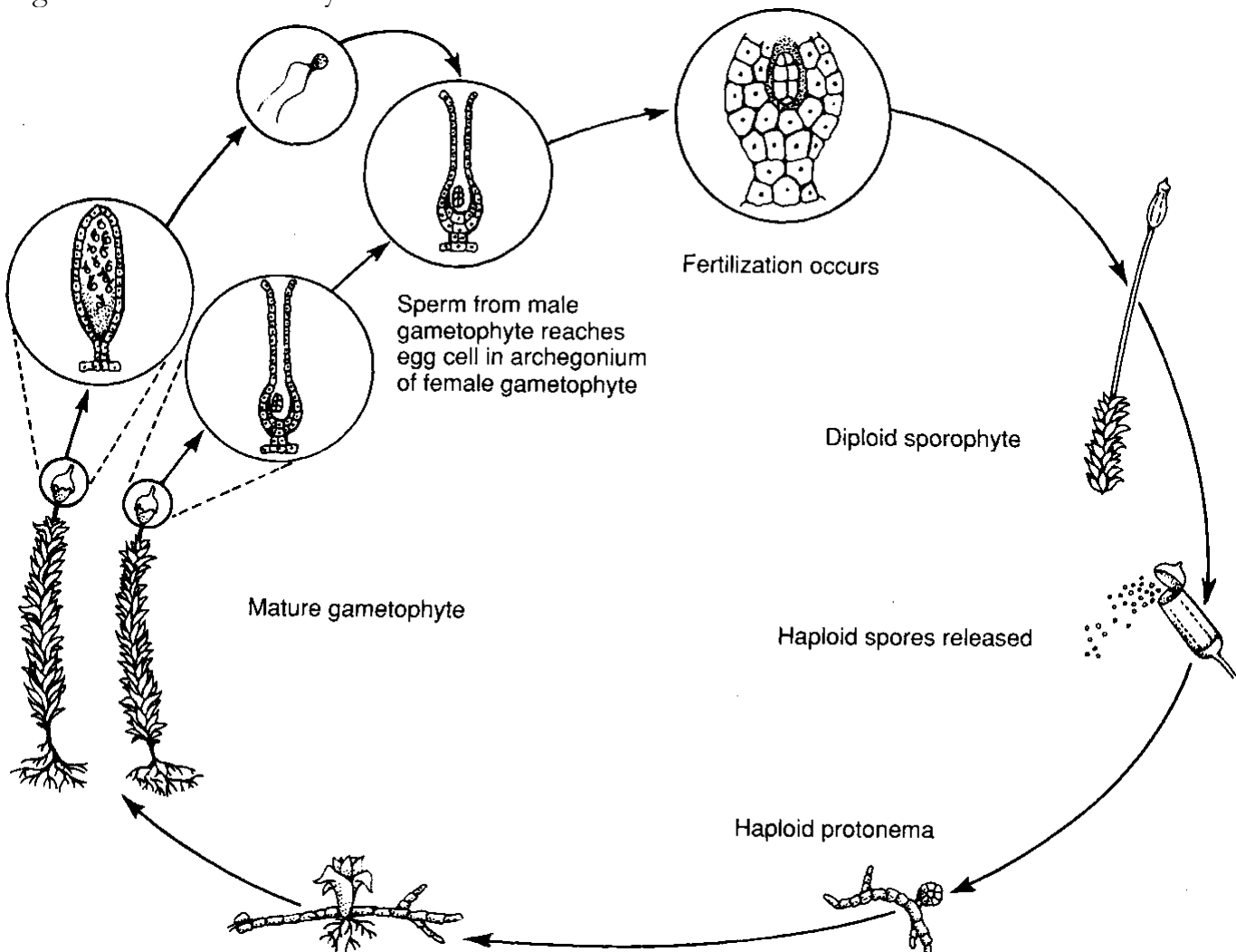


Adaptive Structures and Reproduction of Moss

Non-vascular plants that live on land include the liverworts and the mosses. These plants are generally found in moist environments because they lack the water-conducting tubes that are found in higher plants. The leaflike structures of the gametophyte are not true leaves because they do not have special water conducting (vascular) tissues. The rhizoids help to anchor the moss to the substrate but are not true roots because they also do not contain vascular tissue.

In mosses, the gametophyte is more prominent than the sporophyte. The sporophyte resulted from the growth of a zygote, or fertilized egg, inside the female organ at the tip of a gametophyte. The sporophyte receives its nourishment from the gametophyte. It is therefore parasitic on it. The capsule at the tip of the sporophyte is the sporangium, which produces spores. A haploid spore becomes a moss gametophyte.

Figure 2 shows the life cycle of a moss.



In this investigation, you will look at the adaptive and reproductive structures on a moss.

Part A: The Gametophyte (living specimen)

Examine a small clump of moss. Use Figure 1 to identify the structures of a moss. Describe the arrangement of leaflike structures around the stalk.

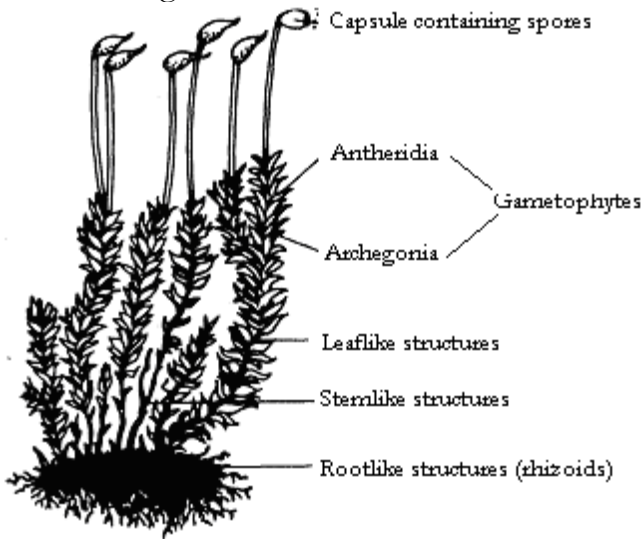


Figure 1

Part B: The Sporophyte (living specimen)

Carefully separate a sporophyte from a gametophyte. A sporophyte consists of one stalk with a capsule on it. The green "leafy" part is the female gametophyte. Notice that the capsule has a cap on it.

Observations:

Part A: The Gametophyte (living specimen)

1. How are the leaflike structures arranged around the stalk?
2. How many cell layers does the leaflike structure appear to have?

Part B: The Sporophyte (living specimen)

1. Make a labeled drawing of the sporophyte.

Total Magnification:

Discussion (read the introduction for answers):

1. What type of environment would be best for a moss to grow?
2. Why is moss not usually found growing in areas of little rainfall?
3. Why do moss plants grow close to the ground?
4. Why is having a cuticle important to a land plant?
5. Why are the leaflets of moss not a true leaf by definition?
6. What functions do rhizoids perform for the moss plant?
7. Since this structure is called a “sporophyte”, what structures will it produce?
8. What are the structures inside the moss capsule called?
9. How does a moss capsule disperse its contents?
10. Why might a moss plant benefit by having a high-growing sporophyte?
11. What type of cell division must occur at this time to give rise to these structures?
12. From where does the zygote derive its energy?
13. What is the female gametophyte called?
14. What is the male gametophyte called?
15. What substance is necessary for the flagellated sperm to reach an egg?

16. Which generation (1N or 2N) last longer? Which generation, therefore, would you consider the dominant generation in moss life history?
17. Gardeners often add sphagnum moss to soil. How might this be helpful?

Conclusion:

Moss belongs to the kingdom _____. It belongs to the phylum _____ because it does not have _____ tissue. In mosses, the _____ (sporophyte/gametophyte) generation produces spores. The spore-producing generation is _____ (haploid or diploid). In mosses, the _____ (sporophyte/gametophyte) generation produces sperm and egg. The gamete-producing generation is _____ (haploid or diploid).