**Seedless Plants Lab**

**Learning Objectives**

* Explain what is meant by “alteration of generations”
* Explain the difference between the sporophyte and gametophyte generation in plants. State which generation is haploid and which is diploid
* Name the process that makes spores and state if spores are haploid or diploid
* Name the process that creates sperm and egg from spores and state if sperm and egg are haploid or diploid
* Name the phyla discussed in the lab and give an example of a plant from each
* Identify and know the function of the archegonium and the antheridum
* Identify the fern structures discussed
* Understand the basic moss and fern life cycle

**Procedure and Questions**

1. Access the page “Reading: Seedless Plants.”
2. Phylum Bryophyta (Mosses)
   1. View the live moss specimens available in the lab.
      1. Is the green “leaf like” tissue gametophyte or sporophyte?
      2. Is the stalk that emerges from the green “leaf like” tissue gametophyte or sporophyte?
   2. As indicated in the reading, use the space below to draw a simple life cycle of the moss. Include in the life cycle 2N, N, sporophyte, gametophyte, meiosis, spores, egg, sperm, antheridium, archigonium, fertilization. If you need help in constructing your life cycle picture check out this website: <http://life9e.sinauer.com/life9e/pages/28/282001.html>
   3. View the prepared slide of the archigonium and the antheridum (there should be a slide with both).
      1. Is the archegonium male or female?
      2. What cell is produced in the archegonium?
      3. Is this cell haploid or diploid?
      4. Is the antheridium male or female?
      5. What cell is produced in the antheridium?
      6. Is this cell haploid or diploid?
   4. View the prepared slide of the moss capsule.
      1. Is the capsule sporophyte or gametophyte tissue?
      2. What cell is produced in the capsule?
      3. Is this cell haploid or diploid?
      4. How are moss spores dispersed to new locations?
3. Seedless Vascular Plants
4. Phylum Pterophyta (Ferns)
   1. As indicated in #1 of the website use the space below to draw a simple life cycle of the fern. Include in the life cycle 2N, N, sporophyte, gametophyte, meiosis, spores, egg, sperm, antheridium, archigonium, fertilization, sorus. If you need help in constructing your life cycle picture check out this website: <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/F/Ferns.html>
   2. Observe the preserved fern frond. Locate the sori on the underside.
      1. Is the frond sporophyte or gametophyte?
      2. What cell is produced in the sori?
      3. Is this cell diploid or haploid?
   3. View the prepared slide of the fern prothallus under the microscope.
      1. What shape is the prothallus?
      2. Is the prothallus sporophyte or gametophyte?
      3. Can you find the archegonium and the antheridium?
      4. What cell is made in the archegonium?
      5. What cell is made in the antheridium?
5. Answer the review questions below.
   1. Is gametophyte tissue haploid or diploid?
   2. Is sporophyte tissue haploid or diploid?
   3. Is the moss life cycle gametophyte or sporophyte dominant?
   4. Is the fern life cycle gametophyte or sporophyte dominant?
   5. In the life cycle of the primitive plant, the process of meiosis produces what cell?
   6. Does the gametophyte or sporophyte generation produce spores?
   7. What process do spores undergo to create sperm and egg?
   8. State one reason why moss and fern are considered primitive plants.
   9. What is meant by the idea of “alteration of generations?”

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