# LAB #4B - CLASS POLYTRICHOPSIDA PART 1

Class Polytrichopsida http://blogs.ubc.ca/biology321/?page\_id=66



1. *Polytrichum commune* (Fig. 4B-1) http://blogs.ubc.ca/biology321/?page\_id=1092



*Polytrichum commune* is a large haircap moss that is common to many parts of the world. It often grows near streams and wet areas, but is very tolerant of periods of desiccation.



Fig. 4B-1 Polytrichum commune

#### a) Leafy gametophore

Place a shoot on a microscope slide on the stage of the dissecting microscope. Parallel **lamellae** are visible as longitudinal lines on the costa. The toothed margins of the leaves should also be apparent. Strip off several leaves into a drop of water. Make cross-sections of the leaves and examine them with the dissecting microscope under high power with transmitted illumination. Examine a leaf cross-section with the compound microscope; note the unistratose lamellae with notched tips and the thickened costa made up of stereids, guide cells, and hydroids (paired, scattered among the stereids). Examine the prepared slide of leaf cross-section and compare it with yours. **Draw a leaf cross-section and label.** 

Place the denuded stem on a microscope slide on the stage of the dissecting microscope. Add a drop of water. Make several cross-sections. Remove all material except the cross-sections and add a cover slip. Examine under highest power of the dissecting microscope with light transmitted from below. Note the stereids in the cortical region, the **hydrome** composed of **hydroids** in the centre, and **leptoids** (**leptome**) external to the hydrome. **SKETCH**. There is a prepared slide of stem cross-sections for comparison.

### b) Sporophyte

Remove a shoot bearing a sporophyte. Remove the calyptra if present. **Describe the structure of a calyptra.** 

Carefully remove the operculum from the sporangium. Note the **epiphragm**, which is an expansion of the columella. The peristome teeth are attached to the edge of the epiphragm.

Examine a longitudinal section through the sporangium. Compare it with Fig. 4B-2. **Label** the figure with the following terms: calyptra, air spaces, operculum. epiphragm, spore-bearing layer, columella, jacket, seta, and peristome teeth. Note the multicellular nature of the peristome teeth and their location.



Fig. 4B-2 Longitudinal Section through the Sporangium of *Polytrichum*.

Examine a cross-section section through the sporangium. **Draw a** diagram of the cross-section and label all relevant parts.

How are spores dispersed in this plant?

Cut several cross-sections of the seta into a drop of water on a microscope slide. Add a cover slip. Examine with the low power of the compound microscope, then increase to higher power to note details. The following should be visible: cuticle, a thickened outer layer of the epidermal cells, stereids and parenchyma cells. **Hydroids** and **leptoids** may be visible, but it is not easy to make suitable sections if the material is really mature (the hydrome falls out when sectioning). **SKETCH** 

Examine a male plant. Make a quick sketch to show annual growth increments.

2.

Place the perigonial portion in a drop of water on a microscope slide. Place the preparation on the stage of the dissecting microscope. Spread the perigonium apart with a probe. Note the position of the antheridia relative to the perigonial leaves. Remove coarse material and add a cover slip to the preparation of antheridia and paraphyses. Examine with the compound scope. The antheridia are elongated sacs, while the paraphyses are mainly uniseriate...but not all of them. **SKETCH.** 

How does the structure of the perigonium of *this* Polytrichid differ from that of *Plagiomnium*?

Identify the species with the key provided

## LAB #4B - CLASS POLYTRICHOPSIDA PART 2

**3.** *Atrichum* http://blogs.ubc.ca/biology321/?page\_id=1026



Like other members of the Polytrichopsida, this moss is acrocarpous. Examine that the calyptrae of *Atrichum*. How are they dissimilar to those of other members of this class? Make a slide to observe the teeth at the tip of the sporangium. **SKETCH.** 

Note the leaves of *Atrichum* as they dry. How is this different from *P. commune*? Examine under high power of the dissecting microscope (light through the material). How many lamellae are there per leaf? How many cells tall are they?

Describe or draw the terminal cell of a lamella. Is there a cuticular thickening?

The leaf margin is made up of elongate cells and has sharp teeth. Some of the cells of the leaf may have sharp teeth in diagonal rows. All cells are filled with chloroplasts, although the marginal cells have fewer. Make appropriate **SKETCHES.** 

### 4. Atrichum vs. Polytrichum \_\_\_\_\_

First, key the *Polytrichum* to species. Complete the table. In the first squares describe the habitats in which you would find these mosses (hint: the species descriptions in your key will be useful). You may need to make additional slide preparations to complete the rest of the chart.

	Atrichum	Polytrichum
Habitat		
Leaf Structure		
Features of Leaf Lamellae		
Relative amount of Cuticle		
Response to Desiccation		
Water Conduction		

Explain the significance of the differences between *Atrichum* and *P*.\_\_\_\_\_\_ in terms of the habitats in which they live.

5. Key Some Mosses!