

Laboratory 4 (cont.): leafy liverworts

Liverworts defined by a suite of traits of the gametophyte and the sporophyte, and their diversity of perhaps 5-6000 species is broadly organized into groups based on the general architecture of their vegetative body: complex thalloid, simple thalloid and leafy.

The concept of this lab is different from the previous ones: you lead.

You are being given several species of local liverworts and should explore these and assess of their traits and get a good understanding of how the main traits vary across species.

Take the dish with the specimen and look at it under the dissecting scope BEFORE you sample one or two individuals for further study.

Look at the entire sample and get a sense of what you are looking at. Some of the samples have sex organs that you should be noticing, some have sporophytes, and in some cases the sporophytes are emerging and mature.

Always return the dish to the table immediately after sampling.

Species (specimens) available to you

Porella platyphylla: on seasonally submerged rocks in rivers.

Odontoschisma sp.: in moist and shaded peaty pond and river banks

Diplophyllum apiculatum: on moist and shaded soil

Cephalozia sp.: in moist and shaded peaty pond and river banks

Lophocolea bidentata: common on decomposing logs

Ptilidium pulcherrimum: common on decomposing logs

Nowellia curvifolia: on decomposing wood (rarely bark)

Frullania sp. common on trees.

Questions to consider when exploring the material and recording your observations.

Stems

- Are the stems branched (branches alternate or opposite? Could they be opposite?)
- Can you distinguished a ventral and dorsal surface

Rhizoids

- Are rhizoids present and how are they distributed on the stem?
- Are rhizoids unicellular?
- Are rhizoids branched?

Leaves

- Are the leaves incubous or succubous? How are they inserted? Does the forward margin of the leaf overlap the rear margin of the leaf in front of it?
- Are the leaves organized in two or three ranks?
- Are all leaves isomorphic around the stem?
- Is the leaf margin entire or toothed or notched?
- Are the leaves entire or lobed?
- If the leaf is lobed, do the lobes differ? Is one smaller, highly modified.
- If one lobe is smaller, is it highly modified?
- Are underleaves present?
- Do underleaves differ from lateral leaves?
- Are the underleaves entire or lobed?

Leaf cells

- Are cells uniform across the leaf?
- Are the marginal cells differentiated?
- Are the cell walls of the cell uniformly or unevenly thickened?
- Are oil bodies present? Describe them.

Sex organs

- Several specimen bare a sporophyte so their sex should be obvious (but can you be certain?).
- *Porella*: the species is dioicous, and these plants are expressing their sex; no sporophyte. Find the sex organs. This could be an obvious for the lab assessment (can you recognize sex organs).

Sporophytes

- At least two species bear sporophytes.
- Are the leaves surrounding the sporophyte, differentiated, specialized for their function? How so. Explain.
- Are the sporophytes mature? How can you tell?
- Can you see a shoot calyptra, that is a modified archegonium surrounding the sporophyte?