Invasion of Land

Bryophytes

- **Liverworts**
- **Hornworts**
- **Mosses**

***[All have alteration of generations - gametophyte dominates]**

Liverworts

- **anteridiophore**
- **archegoniophore**

***[Protects embryo]**

Hornworts

- **plus….**
- **stomates**

***[controls CO2 and H2O vapour, exchange]**

Mosses

- **leptoids and hydroids**

***[long distance transport]**

- The invasion of land occurred around 450-500 million years ago. Begin to see clear evidence like spores that prove the initial invasion of land. Animals were invading land as well. However, plants invaded land first then animals.
- Range of complexities associated with plant invasion.
- There are some sorts of aspects associated with invasion of land in terms of the adaptability of the organism to survive on land. Some of the criteria were a)chlorophylls a and b, carotenoids, starch b) phragmoplastic cell division, glycolate oxidase [photorespiration] c) archegonium and antheridium d) indeterminate growth of sporophyte e) water and cell sap conducting tissue system (vascular tissue: xylem and phloem)
- phragmoplastic cell division- cell division is conducive to the ability to invade land- to do this in a dry environment. Has an adaptive trait for being able to survive on land. Glycolate oxidase- photorespiration- oxygen problem talked about before. High levels of oxygen which compete on the same enzymes as carbon dioxide does. The enzyme that does this is glycolate oxidase. Issue is when you look at this between charophytes and other organism. In an aq environment you have two forms of CO_2. As a gas