

1. Sporophyte generation
2. Gametophyte generation

### General characteristics of bryophytes:

1. True roots are absent in bryophytes and is performed by filamentous str. called rhizoids.
2. The plant body is composed of parenchymatous cells only.
3. The rhizoids are either unicellular and unbranched or multicellular and branched.
4. They reproduce by vegetative and sexual methods.
5. Vegetative reprod<sup>n</sup> is takes place by death and decay of older parts of thallus, by adventitious branches or by special str. like tuber, gemmae.
6. Sexual reprod<sup>n</sup> is of oogamous type and sex organs are multicellular.
7. The sex organs are of 2 types —
  - i) ♂ sex organs are multicellular antheridia and have an outer sterile one cell thick jacket (globose/elliptical)
  - ii) ♀ sex organs (Flask shaped), and known as archegonium. having neck (basal swollen)

2. In mosses the gametophyte thallus of a moss plant is composed of an erect to prostrate stem bearing spirally arranged "leaves". The growth of moss thallus take mitotic div. of single pyramid cell. The Protonema, In mosses an extensive, branched system of multicellular filament that are rich in chlorophyll grows directly from the germinating spore called as protonema.

In creeping moss there may be short leafy branches grows from substrate produce long, trailing stems. All mosses have rhizoids <sup>which</sup> has absorptive function like tree roots.

The thalli of most liverworts and hornwort has rich in chlorophyll on its dorsal surface and situated deeper and storage products of photosynthesis. This gives thalli analogous to leaves of vascular plants.

The archegonia of liverworts is similar to that of paraphysis of moss. Sporophyte of mosses usually consist of foot which penetrate the gametophore. The seta contains of chloroplasts.



composed of thin walled parenchymatous cells. In A. hallii epidermal layer is not visible distinguishable.

The air chambers and air pores absent in Anthoceros. In few species the intercellular cavities present in lower surface of thallus. The multiple cavities opens on the ventral surface through stomata like slits or pores called slime pores.

2. In liverwort, typically represented by Marchantia sp., Riccia sp., Porella sp. etc. the thallus <sup>are</sup> flattened, ribbon and leafy or stem not vascularised respectively. In <sup>the</sup> liverworts the thallus is dichotomously branched. <sup>The</sup> gametophytes <sup>of</sup> liverworts are generally prostrate and many cells thick with chamber of filamentous parenchyma cells under the upper epidermis. In this upper epidermis has chimney cells surrounding pores. Gemmae is produced in gametophyte. Most liverworts gametophytes are dioecious (heterothallic). The ♂ sex organs is known as antheridia and ♀ sex organs is called as archaegonia. In Riccia, antheridia and archaegonia remain enclosed on the dorsal surface of the thallus.