

Classification of Bryophyta according to Strotter and Crandall (2009) upto class with diagnostic characters and examples -

According to Crandall and Strotter (2009), Bryophytes are classified into 3 phyla which again was classified into classes.

■ Phylum-I: - Marchantiophyta

The members of Marchantiophyta are commonly known as Liverworts and represents the following features -

- (i) The plants are thalloid, rhizoids unicellular and scale multicellular.
- (ii) Chloroplast don't have pyrenoids, oil body is present.
- (iii) Male sex organs known as antheridium and female sex organs known as archegonium. Reproductive structure are superficial.
- (iv) Sporophytes are differentiated into foot, seta and capsule. In sporophytes, sporogenous cells are endothelial in origin. cotumella is absent and spore dispersal takes place by elaters.
- (v) on nutrition, the sporophytes depends on gametophytic parts.

e.g. → Marchantia palmata

Marchantiophyta members are divided into 3 classes -

■ Class-I: - HAPLOMITRIOPSISIDA

- (i) Haplomitriopsida members are most primitive bryophytes having prostrate leafy thallus, the thallus is bifid, wing like structure are formed from lateral part of the thalloid body.
- (ii) The members do not have rhizoids, vascular tissue are absent.
- (iii) Reserve food materials are oil bodies which remain present in cluster.
- (iv) In between the vegetative cells, plasmodesmata are found.
- (v) upright stem like structure from which leafy portion are developed.

e.g. → Haplomitrium ovalifolium

■ Class-II: - MARCHANTIOPSISIDA

- (i) The members of Marchantiopsida bear both smooth walled rhizoids and multicellular scale.
- (ii) upper portion of the thallus contains air chambers with superficial pores. At the floor of air chambers, photosynthetic filaments are found.
- (iii) The members contain starch, oil bodies at their storage tissue.
- (iv) Sporophytes are protected by calyptra, perigynium and perichætium.

e.g. → Marchantia polymorpha, M. palmata

■ Class - III :- JUNGERMANNIOPSIDA

- (i) The members of Jungermanniopsida are foliose structure with leaves at 3 rows, dorsal leaves are bilobed.
- (ii) Antheridia are solitary, archegonia present in cluster.
- (iii) The small ventral leaves are present in series, known as amphigastria.
- (iv) Archegonia contain small stalks, but in antheridia it is very long.

e.g. Porrella sp.

■ Phylum - II :- ANTHOCEROTOPHYTA

- (i) The plants belonging to Anthocerotophyta are commonly known as 'Hornworts' having prostrate dorsiventral gametophyte thallus and erect sporophytic thallus.
- (ii) The chloroplast are provided with pyrenoids, air chambers and air pores are absent.
- (iii) Sporophytes are differentiated into foot, meristematic zone and capsule, columella is present at capsule.
- (iv) Antheridia are ~~deep~~ endogenous but archegonia are superficial.
- (v) Sporogenous tissue is present in rows and the jacket contains stomata like structure. Spore dispersal takes place by Pseudolater.

e.g. - Anthoceros sp.

The phyla Anthocerotophyta contains only one class i.e. Anthocerotopsida.

■ Phylum - III :- BRYOPHYTA

- (i) The plants belonging to Bryophyta are divided into root like rhizoids, caudex (stemlike structure) and phylid (leaflike structure).
- (ii) The gametophytes contains hydroid and sporophyte contains columella to transport water and minerals.
- (iii) Sporophytes are differentiated into foot, seta, capsule.

- (iv) In most of the cases, spore dispersal occurs by peristome teeth.
- (v) Stomata like structure are present at sporophytic wall.

e.g. Funaria hygrometrica

The plants belonging to Bryophyta are classified into 6 classes -

■ Class-I:- TAKAKIOPSIDA

- (i) The members of Takakiopsida are found at rocks and stones at waterfalls. Sporophyte can prepare food.
- (ii) Leaves are provided with 2-4 lobes.
- (iii) The stems are cutinised and rhizome like stem is present.
- (iv) Archegonia are provided with long neck, small venter and a very small stalk.

e.g. - Takakia lepidozoides

■ Class-II:- SPHAGNOPSIDA

- (i) The Sphagnopsida members contain rhizoids but scales are absent.
- (ii) Leaves contain 2 types of cells - small green leafy cells and large ~~cells~~ dead cells having water storage capacity.
- (iii) The plants prepare large number of antheridia and archegonia at gametophyte surface.
- (iv) They have well developed columella for the purpose of conduction.

e.g. - Sphagnum simplex

■ Class-III:- ANDREAEOPSIDA

- (i) The Andraeopsida members contain rhizoids, caudex, phylid.
- (ii) Sporophyte are well differentiated into foot, seta and capsule.
- (iii) Within capsule air space are present.
- (iv) Peristome teeth are completely absent. Spore dispersal occurs after longitudinal dehiscence of capsule.

e.g. - Andraea sp.

■ class - IV: ANDREAEOBRYOPSIDA

- (i) The plants belonging to Andraeobryopsida are heterotrichous, dioecious, male and female reproductive organ are developed in different thalli.
- (ii) sporophytes has long seta, capsule is short.
- (iii) stomata are found at capsule wall.
- (iv) The upper part of capsule remain covered by calyptra.
e.g. → Andraeobryum sp.

■ class - V: POLYTRICHOPSIDA

- (i) The plants of polytrichopsida are made by rhizoid, caulid and phylid.
- (ii) The leaflike structure are narrow, mid-vein present.
- (iii) The plants have a large sporophyte with foot, seta and capsule.
- (iv) operculum is pointed and present above epistomum, spore dispersal takes place by peristome teeth.
e.g. Polytrichum sp

■ class: - VI: BRYOPSIDA

- (i) Gametophyte are well differentiated into rhizoid, caulid, phylid. At the centre of the stem like structure very narrow conducting hydroid is present.
- (ii) Antheridia and archegonia remain present at separate branches.
- (iii) The operculum is hemi-spherical, calyptra covers a part of capsule, spore dispersal occurs by peristome teeth.
- (iv) Air spaces are found within the capsule, stomata remain present almost at the region of apophysis.
e.g. - Funaria hygrometrica