BRYOPHYTES

SEMESTER – I

PAPER : BOT-111

UNIT – IV

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The Division Bryophyta coomprises of **Mosses & Liverworts** and their allies

Moss Gametophytes with sporophytes evident

Thalloid Liverworts

Division Bryophyta : *Nonvascular Thallophytes*

Characteristic features of Bryophytes:

A. Plant body is a thallus.
B. No **w**ell developed **vascular** tissue. (xylem and phloem).
C. True **roots** and **leaves** absent.
D. **Rhizoids** for anchorage & absorption.
E. **Absorb** their water and nutrients at the **soil's surface**.
F. **Heteromorphic** & show **alternation of generation**.
G. Mostly **dioecious**. Reproduce by Archegonia & Antheridia.
H. Despite being **terrestrial**, compulsorily **require water** for reproduction.

Bryophytes have two stages in their life cycle:

1. Gametophyte – the dominant **haploid** stage in the life cycle, usually associated with **mycorrhizal fungi**. Produce **gametes.**

a) **Antheridia** (singular: **antheridium**) **male** organs, which produces many **flagellated sperms** as the **male gametes.**

b) **Archegonia** (singular: **archegonium**) **female** organs, which each produce only one **egg** as the **female gamete**.

2. Sporophyte

2. **Sporophyte** –

a) the short-lived, unbranched **diploid** stage in the life cycle of the Bryophytes. Entirely dependent on the Gametophyte.

b) It contains a terminal **sporangium**, which produces spores that arises from the **sporophyte** (known as a **calyptra**).

c) This sporophyte releases **spores** which grow into **protonema**, that develop into new gametophytes.

DIVERSITY AMONGST THE BRYOPHYTES

A. Class – Hepaticopsida : the Liverworts

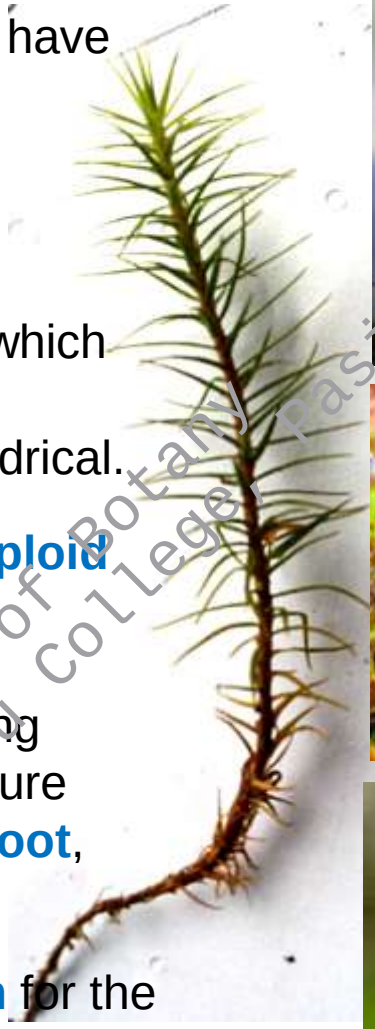
1. **Liverworts** were named during the medieval times. Since they were lobed they were thought to be similar to the human liver.
2. Gametophytic plant body is a **prostrate, dorsiventral**, leaf-like **thallus**.
3. They always have **unicellular rhizoids**.
4. They have **photosynthetic upper sides** and **non photosynthetic undersides**.
5. Their sporangia are often **unstalked**.
6. They shed spores from the sporangia.
7. They reproduce asexually using **Gamma Cups**, which produces specialized propagules called **gemmules**, that survive as the “older” plant dies off.
8. The most common species is ***Marchantia*.**

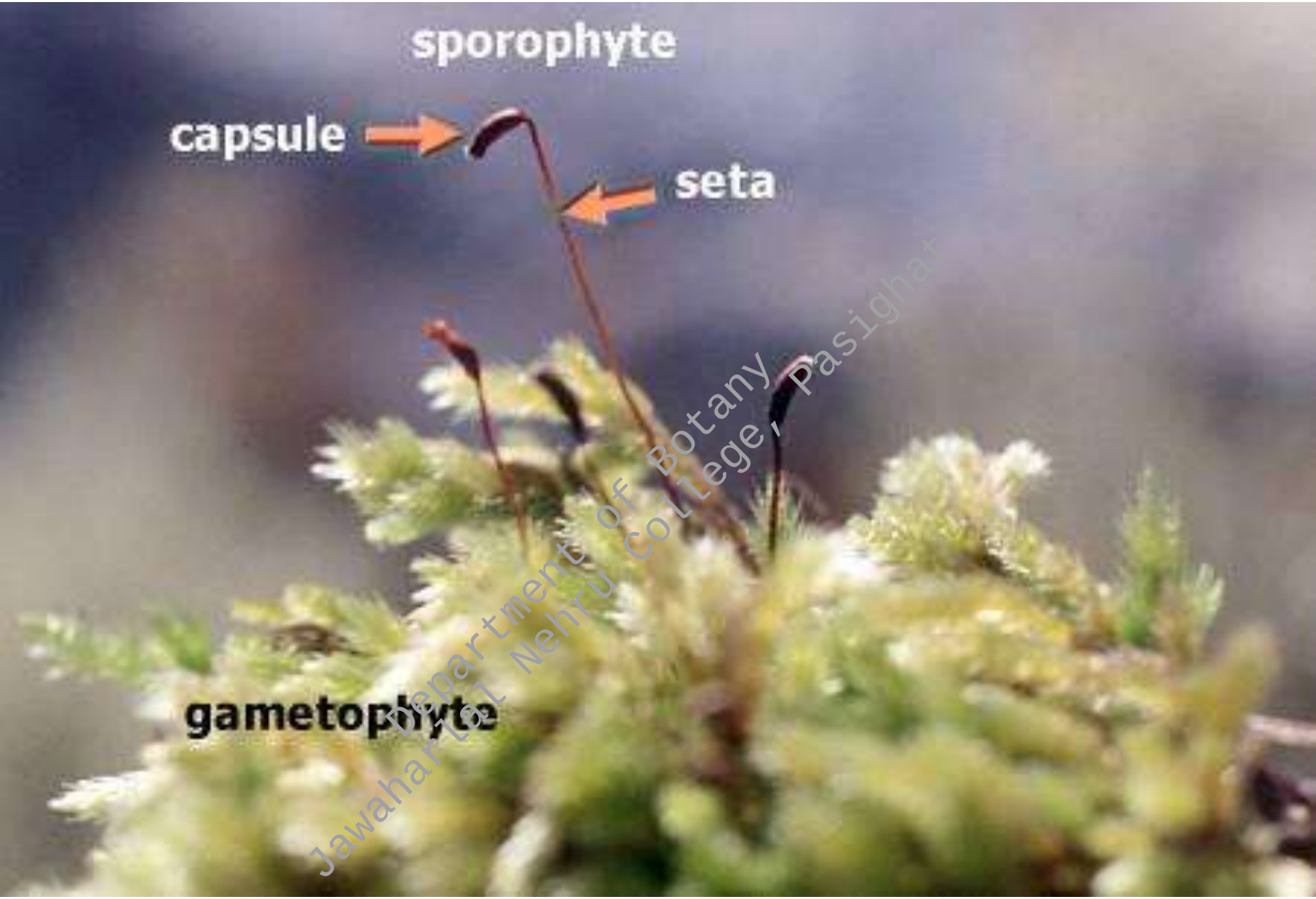
B. Class – Antherocerotopsida : the Hornworts

1. **Hornworts** are our **smallest** group of bryophytes with only 100 species.
2. The most common and well known is ***Anthoceros***.
3. Gametophyte is prostrate, dorsiventral, green and unlobed.
4. Its **sporophyte** is considered to be the most advanced among bryophytes in evolutionary terms.
5. The **sporophyte** is shaped like a small horn.
6. Each photosynthetic cell has only **ONE** chloroplast.
7. The cavities of hornworts are filled with **mucilage**.

C. Class – Bryopsida : the Mosses

1. Mosses do not have leaves but ***do*** have leafy extensions.
2. Their spores form a filamentous **protonema**. *(means first thread)*
3. The **protonema** sends out shoots which grow up into **gametophytes**. The gametophytes are upright and cylindrical.
4. From the **gametophyte** arises a **diploid sporophyte** that produces a single **capsule** known as the **calyptra**, a structure that protects the developing spores from **dessication**. The mature **sporophyte** has three parts – the **foot**, the **seta** and the **capsule**.
5. The capsule acts as a **sporangium** for the development of **spores**.





Moss (*Polytrichum*)

Liverwort (*Marchantia*)

Hornwort (*Anthoceros*)