

Phylum Bryophyta (Mosses)

Lesson Outline

- Phylum Bryophyta overview
- General characteristics of bryophytes
 - Morphology
 - Nutrition
- Classification of mosses
- General reproduction in Mosses
- Similarities between mosses and algae
- Economic importance of mosses
- Ecological importance of mosses

Phylum Bryophyta Overview



Moss



Liverworts

Hornworts

- Bryophytes comes from the Greek word "**Bryo**" meaning "**Moss**" and "**Phyte**" meaning "**Plant**"
- Eukaryotic plant-like organism without vascular system
- They consist of **20,000** plant species
- The science dealing with the study of bryophytes is called **Bryologist**

Mosses Overview



True Mosses



Granite Mosses



Peat Mosses

- Consisting of more than 9,250 species of mosses
- They require a watery medium to facilitate the transportation of reproductive cells
- Simple green plants considered as lower plants
- They include; Andreaeopsida (**granite mosses**) Sphagnopsida (**peat mosses**) Bryopsida (**true mosses**)

General Characteristics: **Habitat**



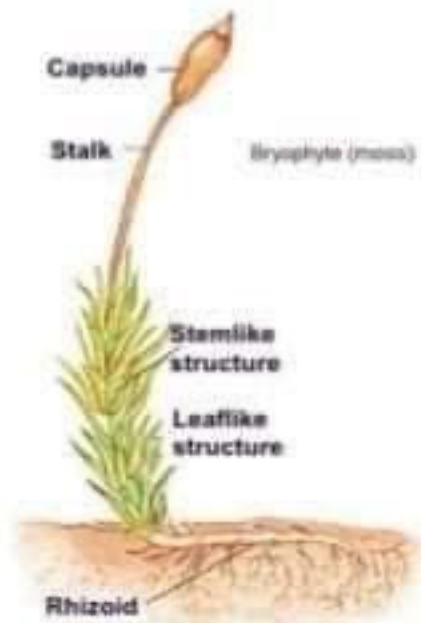
- Mosses are found in moist environment
- Boggy are always home for most mosses
- They can be found on rocks, ground, and trees.



Habitat Cont'd...



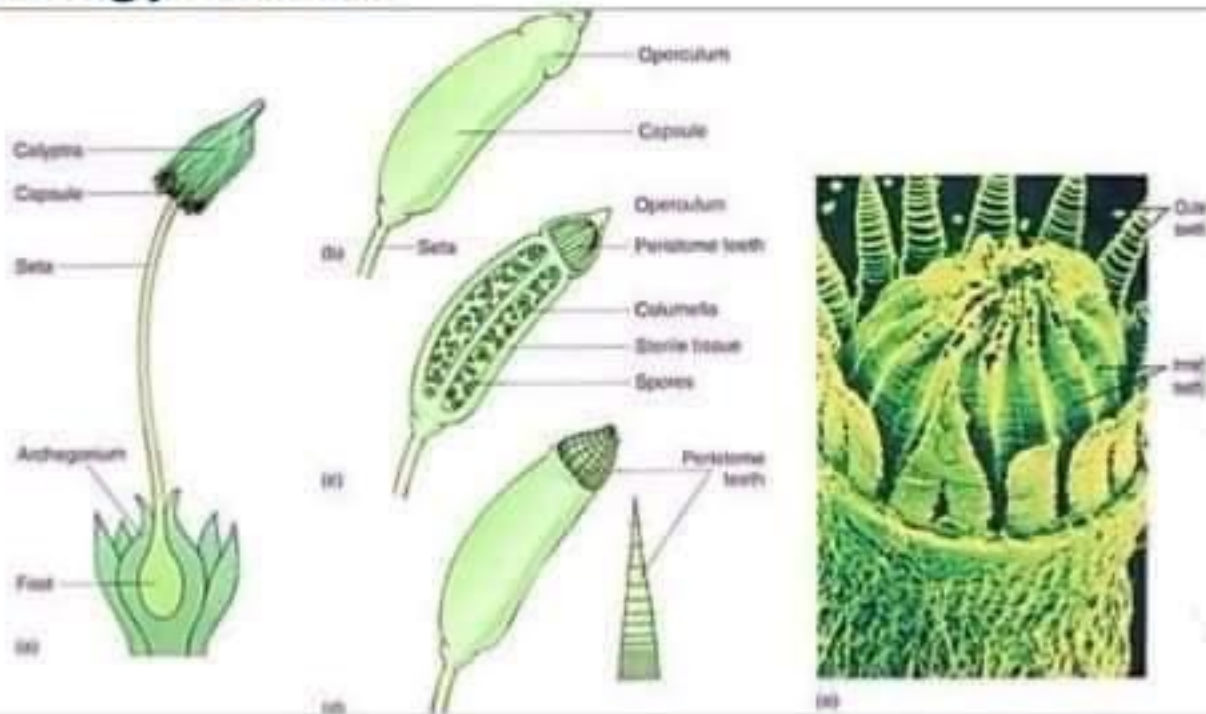
Typical Mosses Morphology



Representation of Moss Gametophyte and Sporophyte



Morphology Cont'd...



General Characteristics: **Nutrition**

- Mosses are **non vascular plant**
- They live as **autotrophs**
- They absorb water and nutrient mainly through their leaves though **diffusion**
- They harvest carbondioxide and sunlight to create food by **Photosynthesis**

Classification of Mosses

Mosses are classified into three class:

- **Class Sphagnopsia**
- **Class Andreaeopsida**
- **Class Bryopsida**

Class Sphagnopsida



Peat moss

- They consist of **150 species**
- They are found on boggy ground
- They have **chlorophyllose** cells and **hyaline** cells
- They consist of the genus **sphagnum** known as **peat moss**
- The gametophyte of the sphagnum has the **pendent** and **divergent**

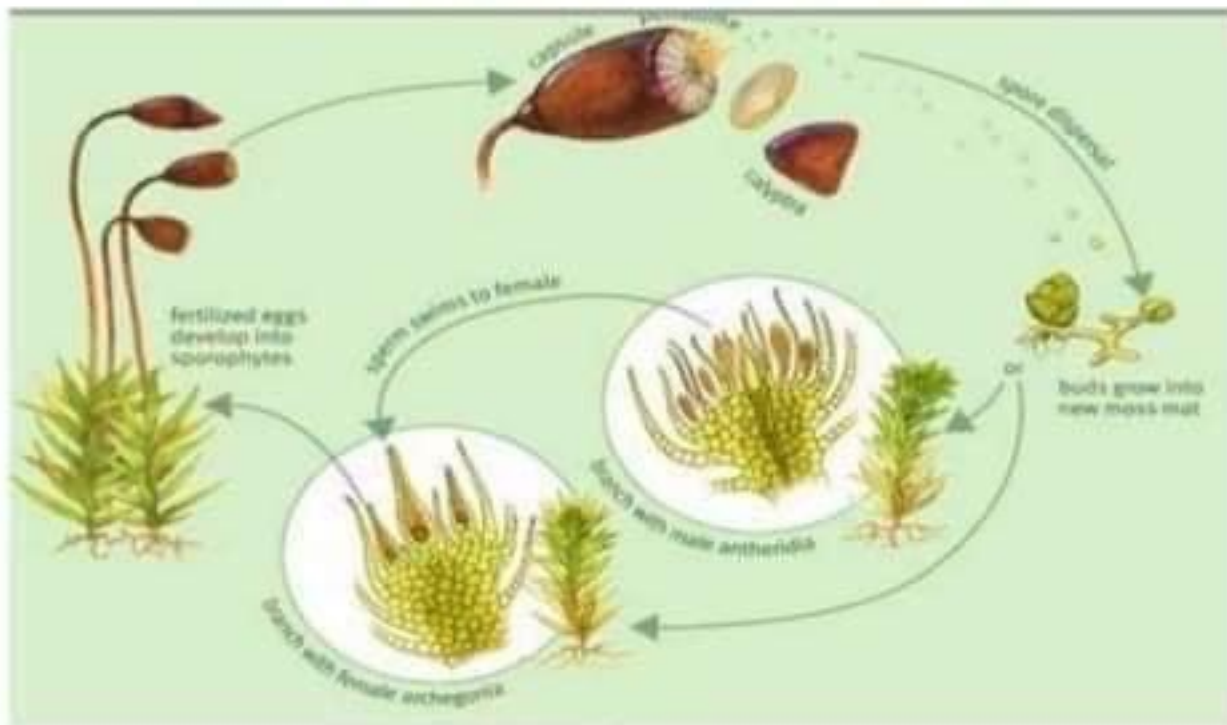
Examples of Sphagnum Mosses



Class Sphagnopsida: Life Cycle

- The life cycle of peat moss is comprise of two distinct generations, the gametophyte and the sporophyte
- At the gametophyte stage which is haploid consist of the plant bearing leaves, synthesizes chlorophyll and is able to sexually reproduce
- By sexual reproduction the gametophyte develops **Antheridia** and **Archegonia**

Class Sphagnopsida: Life Cycle



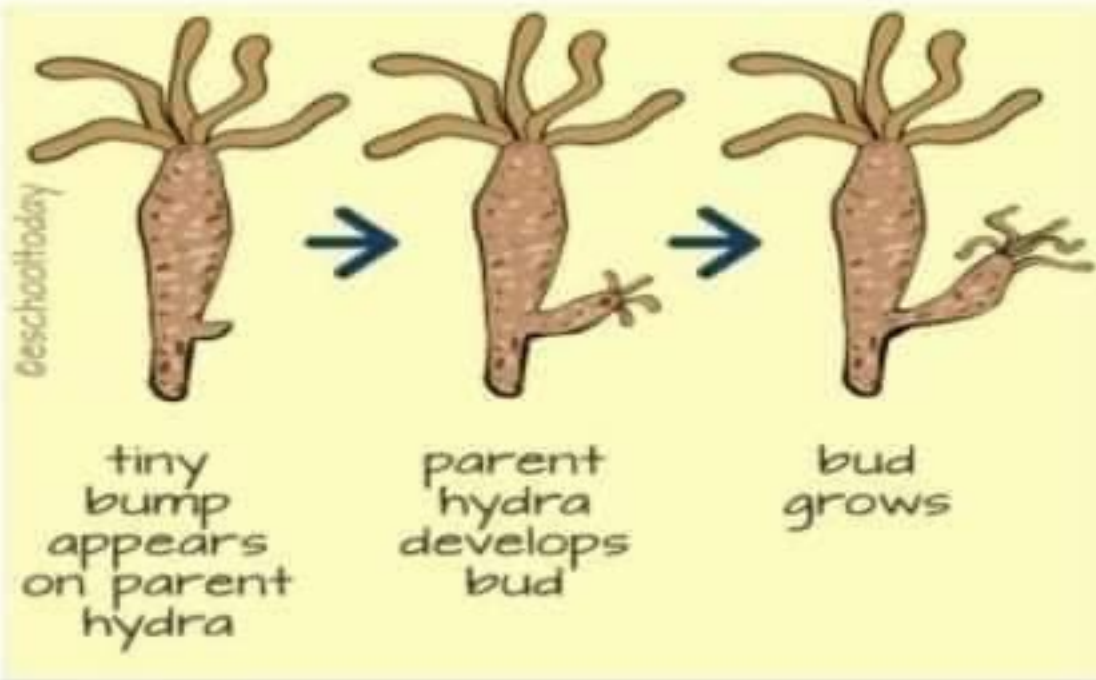
Class Sphagnosida: Sporophyte

- The Sporophyte which is diploid consist of a **capsule** that encloses the spores
- It is develop form a **zygote** as a result of sexual reproduction
- Under dry conditions the operculum burst open with an audible sound.
- In the Sporophyte after replication of the genome homologous pairs of chromosomes come close and cross over their chromatids

Vegetative Reproduction: Peat Moss

- A new stem developed from a branch, during peat moss formation it become separated and grow into an independent plant.
- A plant can also grow from shaded plant fragments
- This can also take place at the **Protonema** to increase the number of buds from a single spore.

Vegetative Reproduction



Class Andreaeopsida



- Andreaeopsida are commonly called **granite mosses**
- They consist of 100 species
- They live on rock
- They are usually blackish green to reddish in color
- They live not only on rock but also on the snow and ice itself

Class Andreaeopsida Cont'd...



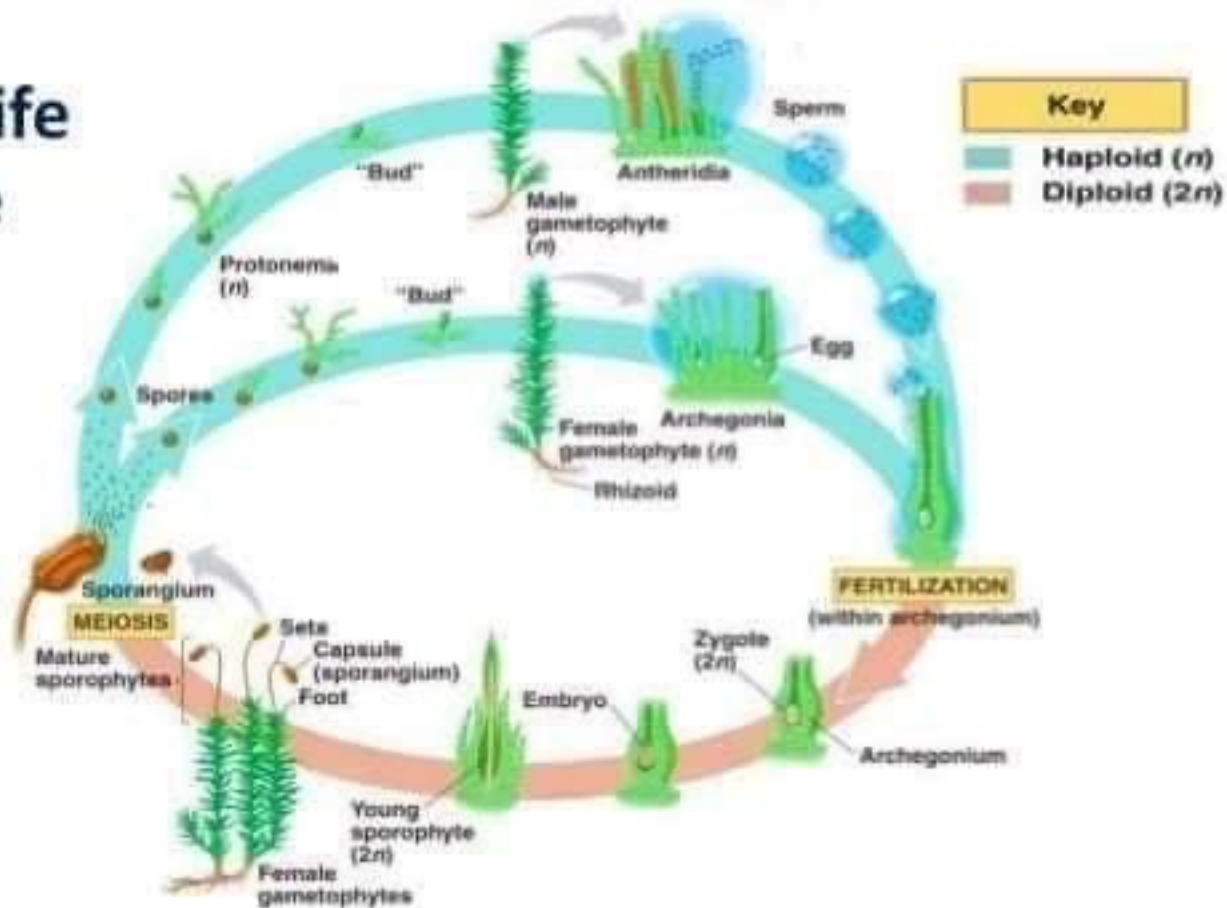
Class Bryopsida

- Bryopsida are the largest class of moss
- They consist of 9,000 species
- They are also called **true moss**
- The life cycle of Bryopsida involves a Protonema that is a threadlike and develop within the archegonium which remain attached to the gametophyte and produce spores by meiosis

General Reproduction In Moss

- Moss undergo both sexual, asexual and vegetative reproduction
- Reproduction in moss require water
- The life cycle begins with the haploid spore

Moss Life Cycle



Similarities between Mosses and Algae

- They both have chlorophyll a and b
- Chloroplast structures are similar
- They have a **thallus** body
- They produce starch and contain cellulose

Difference between Bryophytes and Algae

- Algae are isogamous whereas mosses are oogamous
- The sex organs of algae are not covered by sterile jacket. In mosses they are covered by sterile jacket
- Algae has homogenous alternation of generation
- Mosses heterogenous

Comparative Morphology Among Bryophytes

	Liverworts	Mosses	Hornworts
Structure	Thalloid or foliose	Foliose	Thalloid
Symmetry	Dorsiventral or radial	Radial	Dorsiventral
Rhizoid	Unicellular	Multicellular	Unicellular
Chloroplast/Cell	Many	Many	One
Protonemata	Reduced	Present	Absent
Gametangia	Superficial	Superficial	Immersed

Economic Importance of Mosses

They are use for:

- Fuel
- Decoration
- Dressing of wounds





Ecological Importance of Mosses

They are use for:

- Soil Conditioning
- Primary Producer
- Garden



Garden



In Conclusion:

- Eukaryotic plant-like organism without vascular system
- Consisting of more than 9,250 species of mosses
- They require a watery medium to facilitate the transportation of reproductive cells
- They live as **autotrophs**
- Three classes: They include; Andreaeopsida(**granite mosses**)
Sphagnopsida (**peat mosses**) Bryopsida(**true mosses**)
- Mosses are found in moist environment