

Sphagnum (Peat moss / Bog moss):

Systematic position:

Division: Bryoph

Class: Bryopsida

Sub-class: Sphagnobrya

Order: Sphaginales

Family: Sphagnaceae

Genus: Sphagnum

External features:

Gametophyte:

It consists of two distinct stages:

i) Juvenile protonema

ii) Mature leafy or gametophyte stage.

i) Juvenile protonema:

→ On germination, the spore gives rise to a thin plate like irregular juvenile

protonema forms upright leafy axis of gametophyte

→ They are always loaded with water

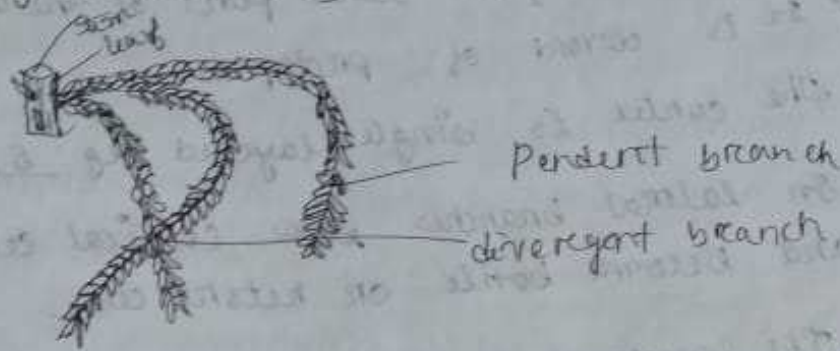
and glow with bright colours like rose

pink due to presence of anthocyanin pigment.

ii) Mature gametophore: The gametophore is differentiated into an upright branches axis and leaves.

a) pendant branches

b) Divergent branches



a) Pendant branch: These branches turn downward and grow parallel to main axis and aid in capillary movement.

b) Divergent branch: These branches grow upward and downward outward. They are smaller than pendant branch and provide the plant str.

iii) leaves are borne on the main axis. They are small, sessile, entire and without midrib. leaf are arranged in spiral phyllotaxy.

B) Internal structure:

Internally, the stem shows distinct differentiation

of tissue —
Outer cortex or the hypodermis

The middle trichom (Prosenchymatous region)
the central cylinder or medulla

Cortex:

→ The cortex forms outer part of the axis

→ It is devoid of protoplast

→ The cortex is single layered eg: S. subseriale

→ In lateral branches some cortical cell elongate and become bottle or necked cell.

→ The neck of the cortical cell is curved and has a pore in the distal end, called as necked cell.

Prosenchymatous region:

Below the cortex 4-6 layers of small, thick walled and narrow prosenchymatous

cells. and provide mechanical support to the axis region is known as hydrom.

Central cylinder:

→ It is the innermost region known as central cylinder / medulla

→ In some sp. vertically elongated thin walled parenchymatous cell lies above the central cylinder eg: S. palustre

Vegetative and sexual methods.

A. Vegetative reproduction:

Vegetative propagation takes place by special branches, known as innovation. These branches develop in the axis of the leaves or the axis.

In some sp., the primary protonema also helps in the multiplication of plants.

Few marginal cells of the stalked primary protonema become metistematic and form multicellular filament. The apical part of this filament forms thallus like sec. protonema.

B. Sexual reproduction:

Sphagnum sp. are monoecious or dioecious. In monoecious sp. antheridia and archegonia are borne on different branch of the same plant. Sex organ develop on special branch and formed in the axis of leaves and much smaller than vegetative branches.

1) Antheridium:

a) Antheridial branches:

→ They are small catkin like branch

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ii) Archegonium:

a) Archegonial branch: Archegonia are borne at the apices of short bud like archegonial branches. These branches are smaller than antheroidal branches. They bear green leaves. In these branches upper leaves protect the archegonia and young sporophyte called perichastem.

b) Development of archegonium:

Archegonia develop at the tip of archegonial branches, present in singly or in groups is formed first and apical cell of the archegonial branch. It is called primary archegonium.

Other archegonia develop from apical cell called secondary branch archegonia.

Before fertilization, the jacket cells surrounding the venter and the basal portion of the archegonial jacket. neck divide periclinally and as such 2-3 layered jacket becomes formed.

c) Mature archegonium:

The mature archegonium is elongated stalked stem with massive venter and a

long twisted venter has an

Fertilization:

In presence of result of and reach of antherozoids formed

Sporophyte:

A. Development

The egg and a generation an archegonium. A an upper called f two ve thus are de and -cium

sterile part of the capsule, the columella.

Structure of mature sporophyte:

The mature sporophyte differentiated into foot, seta and capsule. The foot is cylindrical and haustorial in function. The seta is composed of parenchymatous cells. Seta is narrow region between the foot and capsule. It has many non-functional and rudimentary stomata. A circular biconvex disc shaped lid is present at the apex of the capsule. called as operculum. An operculum is separated from rest of capsule by circular groove known as annulus. The central part of capsule occupied by a cylinder of sterile cells called columella. The young sporophyte is enclosed within calyptra but at maturity elongated and leafless cells of archegonial branch present at the base known as Pseudopodium. The distal end of calyptra forms a sac like str. called vagina.

Behaviour
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spherical
capsule
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Young g
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Behaviour of capsule: The capsule usually dehisces on a bright sunny day by explosive mechanism. Callosities dry up, air space develops beneath the spore sac. Spherical capsule becomes cylindrical due to this shape. capsule compressed and by explosive spore is dispersed and also know as air gun mechanism.

Young gametophyte: The haploid spore are arranged in tetrahedral tetrads and distinct triradiate ridge.

Germination of spore:-

Spore is germinate 2-3 days. Prior of germination, the spore swells up by absorbing water. The endospore form a small germ tube. The apical cell form a flat plate like str. called

primary protonema contain chloroplast. In some sp. (S. girgensohnii) the primary protonema giving rise to leafy sec. protonema vegetatively and form thallose protonema.

- arranged in spirally.
- They bear many small, red, yellow or brown leaves.
 - Antheridia develop in acropetal succession.
 - The youngest antheridium present in apex and oldest at the base.

b) Development of antheridium:

The antheridium develops from a superficial cell of the antheridial branch. It first grows into a papillate outgrowth and divide transversely.

c) Mature antheridium:

The mature antheridium has globular body borne along stalk. The body is surrounded by single sterile jacket cells. Each antherocyte coated cell metamorphoses into a spirally coiled biflagellate antherozoid.

d) Germination of anther:

At maturity, the apical cells swell by absorbing water. As a result turgor generated, the antheridial wall breaks. After the liberation ^{in which} antherozoids swim freely in water.