

Topic: Sphagnum
B.Sc. Botany (Hons.) I
Paper: II Group: A

By

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Systematic position

Class- Bryopsida

Order- Sphagnales

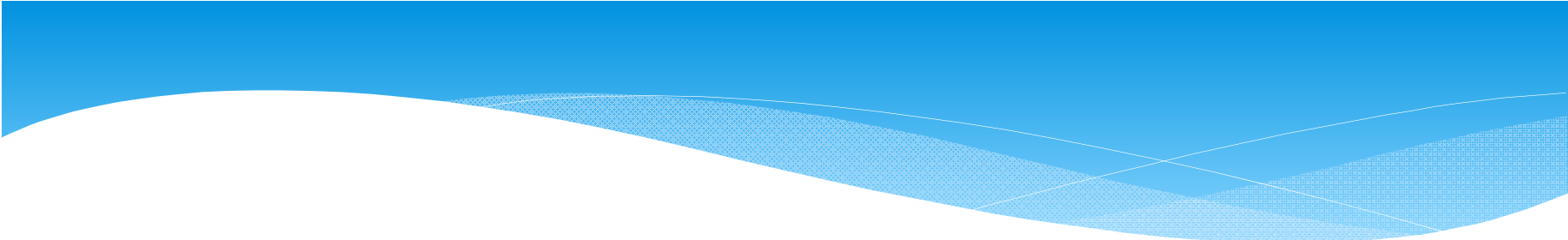
Family- Sphagnaceae

Genus- Sphagnum

Occurrence

The genus includes more than 336 species which are distributed throughout the world extending from tropics, north and south temperate regions, arctic and subarctic zones. According to Bruhl (1931) has reported 10 species from India but Sharma (1949) has reported 17 species from India distributed mainly in Western and eastern Himalayas.

Sphagnum is a perennial genus which grows in dense masse like a cushion in extreme moist condition as semi aquatic or sub merged aquatic plants in ponds, swamps, lakes, wet rocks and other places.



It usually grows in soft water containing less quality of lime. The common familiar names are bog moss, turf moss and peat moss.

The gametophyte

External Structure:

The germination of spore results in the formation of a thallose protonema which usually develops into an erect leafy gametophore. The gametophore is differentiated into rhizoids, stem and leaf. The young gametophore bears colourless rhizoids with oblique septa at the base which disappear as the gametophore matures. The mature gametophore consists of an erect stem bearing leaves and leafy branches. The stem is extensively branched and varies from a few inches up to several feet in length. The stem near apex bears a group of short lateral branches which form the compact conspicuous head known as coma. The branches below the head are of two types-

i. **Pendent or Drooping branches**- Which elongate downward in hanging position

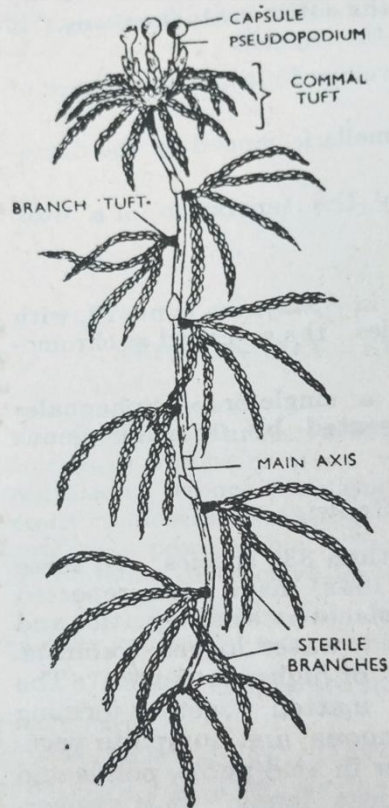


Fig. **Sphagnum** sp. An adult leafy gametophore with a terminal cluster of sporogonia, each at the end of a pseudopodium (Based on Schimper).

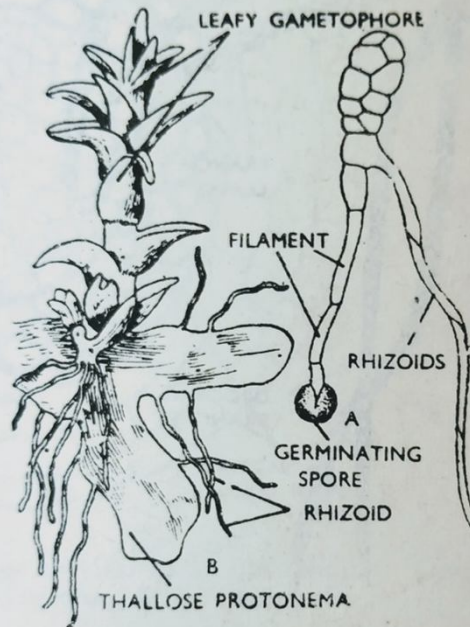


Fig. (A—B). **Sphagnum**. Juvenile stage : A, filamentous protonema arising from the germinating spore and forming terminally a few-celled thallus by the activity of an apical cell; B, Older thallose protonema bearing rhizoids and producing a leafy gametophore (After Schimper).

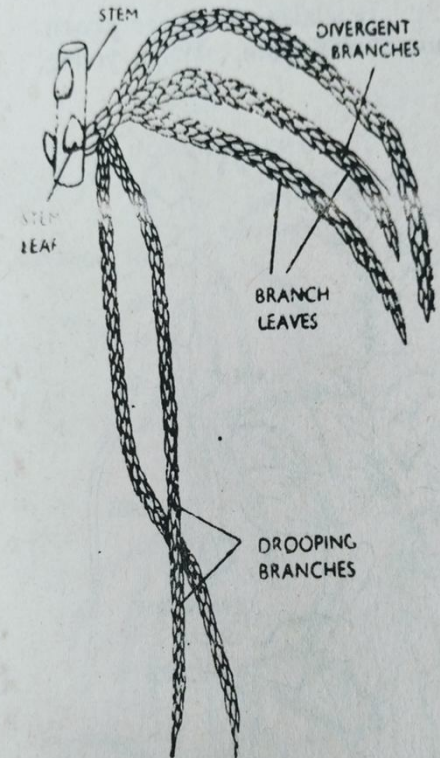
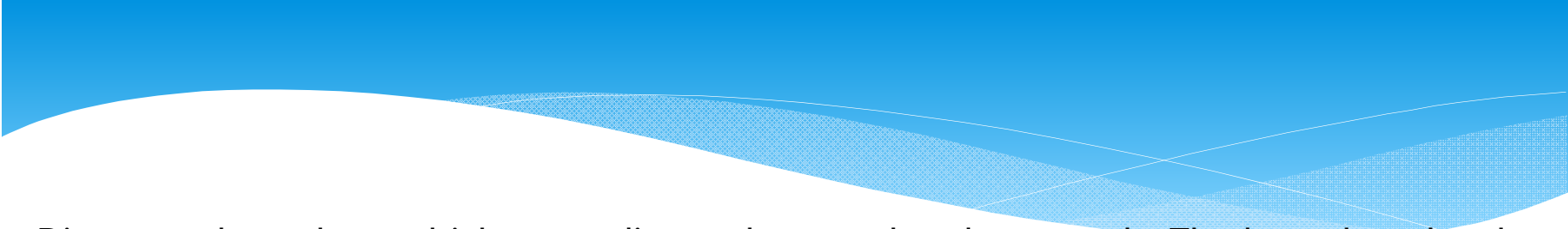


Fig. **Sphagnum** sp. A portion of the stem enlarged to show a branch tuft (Based on Covers).



Divergent branches- which grow directed upward and outwards. The branches develop as nodes of the stems of gametophores.

Internal structure:

Stem:

The stem is internally differentiated into three regions-

- a. Medulla- central axial cylinder
- b. Hadrome- Prosenchymatous
- c. Cortex or Hyalodermis- outer zone

a. **Medulla-** It is the central axial part of the stem which composed of colourless collenchymatous cells. The cells are somewhat elongated and provided with thin walls. This region represents the pith of higher plants and functions as storage tissue.

b. **Hadrome-** It is the middle portion of the stem which lies above the medulla and composed of thick walled prosenchymatous cells.

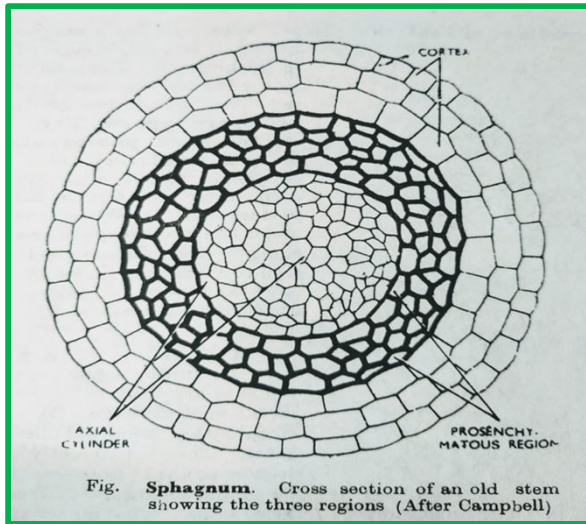


Fig. **Sphagnum**. Cross section of an old stem showing the three regions (After Campbell)

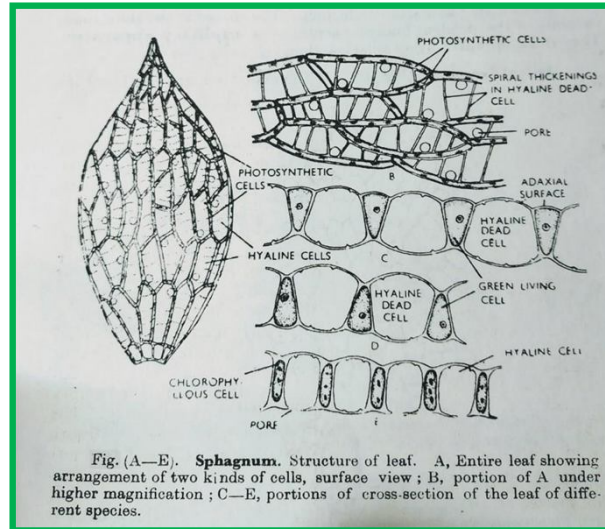


Fig. (A—E). **Sphagnum**. Structure of leaf. A, Entire leaf showing arrangement of two kinds of cells, surface view; B, portion of A under higher magnification; C—E, portions of cross-section of the leaf of different species.

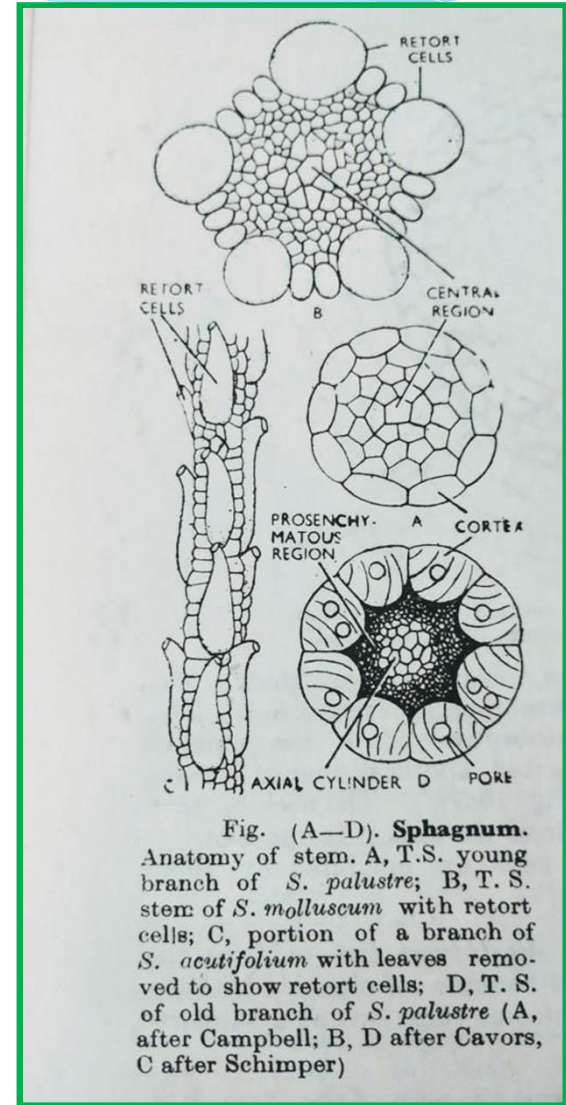
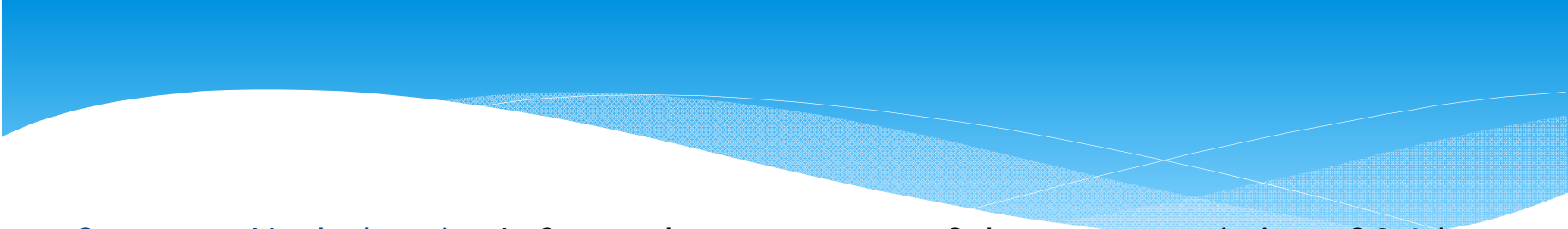


Fig. (A—D). **Sphagnum**. Anatomy of stem. A, T.S. young branch of *S. palustre*; B, T. S. stem of *S. molluscum* with retort cells; C, portion of a branch of *S. acutifolium* with leaves removed to show retort cells; D, T. S. of old branch of *S. palustre* (A, after Campbell; B, D after Cavors, C after Schimper)



c. **Cortex or Hyalodermis-** It forms the outer zone of the stem consisting of 3-6 layers. The layers are composed of compactly arranged cells.

Leaf:

External Structure:

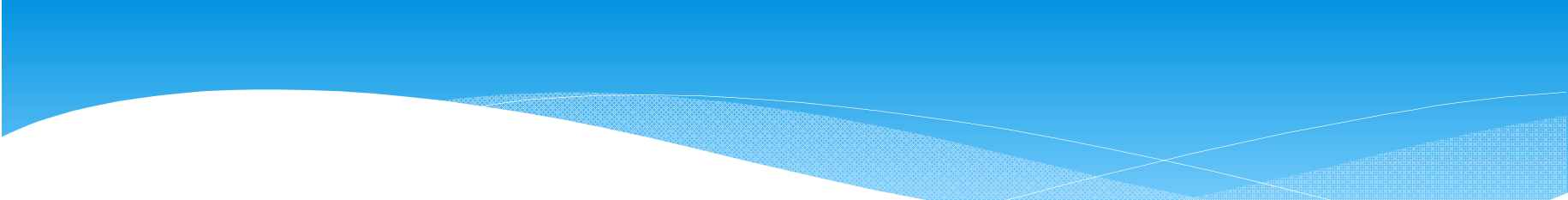
The leaves are formed on the main stem as well as on the branches. The leaves occurring on branches are overlapping and on stem axis they are little apart. The leaves are small thin and scale like without mid rib, sessile and arranged spirally on the stem and branches.

Internal Structure:

The leaf is single layered in thickness. It is composed of two types of cells-

- a. Capillary cells- the ordinary type of cells and green
- b. Photosynthetic or assimilatory cells-

The two kinds of cells are alternated with each other to form a network.



The elongated small assimilatory cells are alternated wide hyaline capillary cells. The assimilatory cells contain chloroplast and photosynthetic in nature. The capillary cells are colourless (hyaline) without protoplasmic contents and hence they are dead and filled with water.