Topic- Sphagnum

Subject- Botany

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System position

class-Bryopsida

Subclass-Sphagnidae

order-sphagnales

Family-Sphagniceae

genus- Sphagnum

Morphology

i. Sphagnum represents Pet or Bog moss growing in ponds or moist place at high altitude including Himalaya. It render the water acidic and has an antiseptic value.

ii. The upright gametophores radially arranged ,leaves leafy branches and without rhizoids.

iii. Erect and pendent branches arises from the axil of a very fourth leaves. The erect branches are crowded and yet the top as comma or head while too much elongated pendent branches forming the loose mental around the stem axis at its proximal end.

iv. The stem axis is solid ,delicate ,cylindrical smooth, porous and distinct ,node and internode.

v. The stem tip terminate in a dense cluster of stout branches of limited growth. Such cluster constitute head or comma which is mean to protect apical bud.

vi. The leafy branches in axis arises in a fiscal of 5 or even more than eight from the axils of fourth leaf on the stem axis .They are dimorphic.

vii. The divergent branches are sort ,stout, extending outward horizontally upward slightly.

viii. Pendent or flagellate form branches ,long,cylinder and droping by virtue of forming close association around the axis.Such branches constitute capillary system being helpful in ascending of water

ix. The leaves are simple ,sessile , semitransparent light green ,yellowish green or pale yellow ,isobilateral, lanceolate, entire, acute, or obtuse, and without midrib..On the leafy branches crowded leaves are arranged spirally in acropetal order.

x. A glandular hair is available in the axis of every young leaves which does not exist in mature leaves .A viscous secretion serves to protect the delicate tissue of young leaves.

xi. The leafy shoot grows by meristematic activity of tetrahedral apical cell having three cutting faces .one third phylotaxy of young leaves correspond to these cutting faces.

fig

Water conducting mechanism of Bryophytes

In sphagnum or Bog Bryophytes presence of spongy texture of stem cortex and leaves due to presence of porous cell compensates for the absence of rhizoids in the adult gametophores..Since they ie stem and leaves are immensely involved absorbing and retaining the water in appreciable amount. The upward conduction of absorption of water to into distinct pathways depending morpho anatomical build of plant.

i. The porous cortical cell in the stem of sphagnum palustre substitute and efficient capillary apparatus by which the water may be easily be ascended from base upwards.
ii. In those sps where cortex is non porous the water is drawn capillary action and efficient system of capillary spaces formed by closely placed pendent branches that constitute a lose mentle around the stem axis.

Ecology of sphagnum

In a nut shell it may said that sphagnum thrives luxuriantly in pond or lake. It sterile seat of water gradually is replaced by organic debris ,humus and eventually by soil being congenial for providing all avenues to the development of land trees culminating in the forest of mesophytic nature .Hence the presence of submerged sps of sphagnum constituting dominant pioneers members pave the way for their own displacement generally in sequence by other plant community and this explain the different stage hydrosere.

Economic Importance of Sphagnum

Sphagnum is known as pet or" Bog Moss" which is of commercially value in horticulture because of its high water retaining capacity. It along with other plant remains increase the acidity of soil even when it is dead and pulverized .It prevents water and form extensive surface mates. Acidic nature of boggs

prevents the growth of microorganism including bacteria so the constant accumulation of sphagnum results in forming the deep deposits called Pet.The lower status of of such deposits may be of considerable age. For instance some boggs of USA are sixteen thousand years old. Practically the pet is used in improving the texture and water holding capacity of soil and in providing nutrients to cultivated plants. In some parts of the world where prevail the deficiency of coal pet is compressed ,dead and burnt .The flavor of skoch, whisky in part is due to pet smooth. It act as insulator against heat and cold during shipment. By virtue of its antiseptic properties it as used in surgical dressing in place of cotton during world war first and Russia and Japan war. It is immensely used garden beats for proper germination of seed and in green houses for raising the plant from cutting ,and is is suitable litter and bedding, spongy texture coupled with higher absorptive power. It is used in the packing the bulbs, seedlings, cuttings and for a lot of other material where moisture is imperative. Glass ware equipments are packed by its while they are exported.

Sphagnum as considered as synthetic group

Sphagnum is interesting genus of Bryopsida showing a remarkable synthesis of liverworts, anthocerotales and moss character .It serves to link together the three classes of Bryophyte are usually regarded as synthetic group. It is an interesting type showing a no structural and developmental characteristics which apparently indicate relationship with Bryopsida in one hand and Hepaticopsida and Anthoceroptopsida on the other hand .They are common characterized which is summarized below-

i. Characters common with Hepaticopsida
   a. The flat like protonema of sphagnum shows similarity to the juvenile stage of some acrogynous jungermaniales in which growth also occurs by two sides apical cells.
   b. .Sphagnum resembles jungermaniales as Porella in position form indehiscent form of antheridia . Antheridia are axillary in position in both the genera.it has a globular body born on a long two celled stalked .Antheridia in both sphagnum and porella dehisces by

rupturing of thinner apical region of jacket into a no irregular lobe which curl back strongly.

c. The position origin and development of archegonia of the sphagnum is similar to that of acrogynous jungermaniales.

ii . Characters common with anthoceroptopsida

i. Absence of apical growth in the sporangium.
ii. Origin of archesporium from amphithecium and the development of collumella from the whole of endothecium.
iii. Presence of photosynthetic tissue in capsule wall.
iv. Presence of large bulbous foot and constricted seta

III. Characters common with Bryopsida

i. Erect radial , leafy gametophores.
ii. Multicellular rhizoids with oblique septa.
iii. Apical growth of stem , leaves and antheridia as in mosses.
iv. The structure of archegonia with long stalk and massive Venter canal cell.
v. Absence of elaters in the capsule.
vi. Dehiscence of capsule by the separation of definite operculum.
vii. Presence of pseudopodium
viii. The structure of leaf of sphagnum consisting bearing green cells with hyaline dead cells having pores shows similarities to the structure of leaf in leucobrycae .In leucobryam the brad thickened midrib shows complexity in the internal structure . it consist of a layer of small ,green photosynthetic cell which is situated between two layer of large hyaline cells with round pores in the wall but no thickening.

Thus sphagnum link to some extent the classes of Bryophyte and regarded as synthetic group.