

On line study material (e-classes)

Name of the College: S.S. College, Jbad.

Date: 04/08.2020

Name of Department: Botany

Time: 11.00-12.00

Subject: Bryophyta

Name of the Teacher: Dr. S.S. Sharma

Topic: Anthoceros

Class: B.Sc (Bot) H - Part I

Medium of Teaching: WhatsApp & college Web-site.

Biotechnology - S. Part I
(H)

ANTHOCEROS.

1. Taxonomic Position :-

Division — Bryophyta

Class — Anthocerotopsida

order — Anthocerotales

Family — Anthocerotaceae

Genus — Anthoceros.

2. Habit and Habitat: -

The genus Anthoceros comprises about 200 species which are cosmopolitan in distribution. However, they are mainly found in temperate and tropical regions. All the species are terrestrial and are found to grow in moist and shady places like slopes, rocks or sides of the ditches.

About 25 species of Anthoceros have been reported from India. of these the common species are - A. erectus; A. himalayensis; A. crispulus; A. Khandalensis. Western Himalaya, Mussoorie, Kulu, Manali, Chamba valley are the common places where different species are found. some other species of Anthoceros and their places of occurrence are - A. dixitii, A. Sahyadrensis (Poona and neighboring hills), A. crispulus (Lucknow), A. assamicus (Assam) etc.

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The species of *Anthoceros* may be perennial (*A. himalayensis*) or annual (*A. erectus*).

3) Gametophyte of Anthoceros:-

i) External Features:-

The gametophyte / plant body is thalloid, dorsiventral, prostrate, dark green in colour with a tendency toward dichotomous branching. This is why rosette like appearance of the thallus appears.

The thallus is bilobed (*A. himalayensis*) or pinnately branched (*A. hallii*) or spongy due to large no. of gemmae (*A. gemmulosus*) or raised on a vertical stalk (*A. erectus*). Some remains prostrate on the substratum (*A. laevis*). Thus, the species of *Anthoceros* exhibit differential habits.

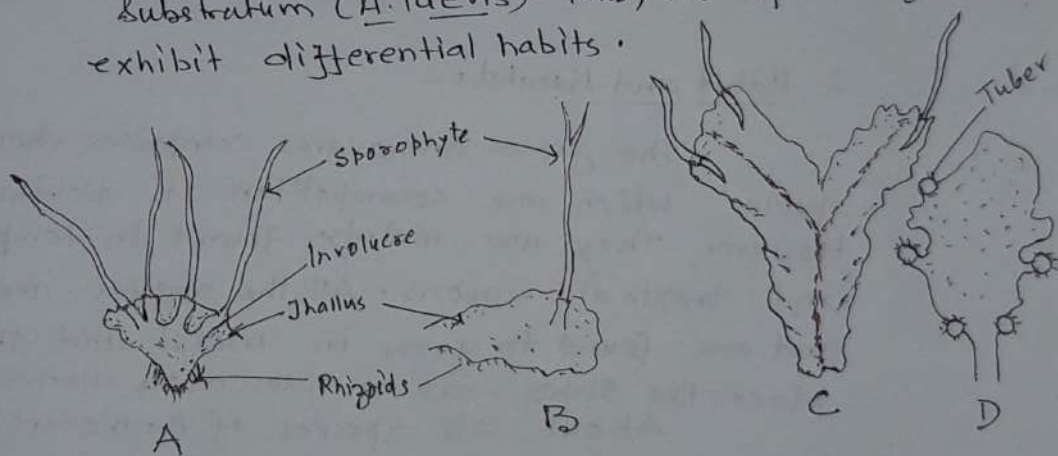


Fig. (A-C). *Anthoceros*. External Features.

(A) *A. erectus*.

(B) *A. laevis*.

(C) *A. himalayensis*.

(D) Thallus with tubers.

* Dorsal surface:- It is shining, thick in middle and without a distinct mid rib. In texture it may be

(4)

Filled with mucilage are found on the lower surface of the thallus. These cavities open on the ventral surface through a ^{stoma-like} pore called "slime pores".

With the maturity of the thallus mucilage dries and cavity is filled with air. The blue green algae *Nostoc* invades these air cavities through slime pores and form colony.

According to Rodgers and Stewart (1977) it is a symbiotic association. ~~but according to Prescott~~

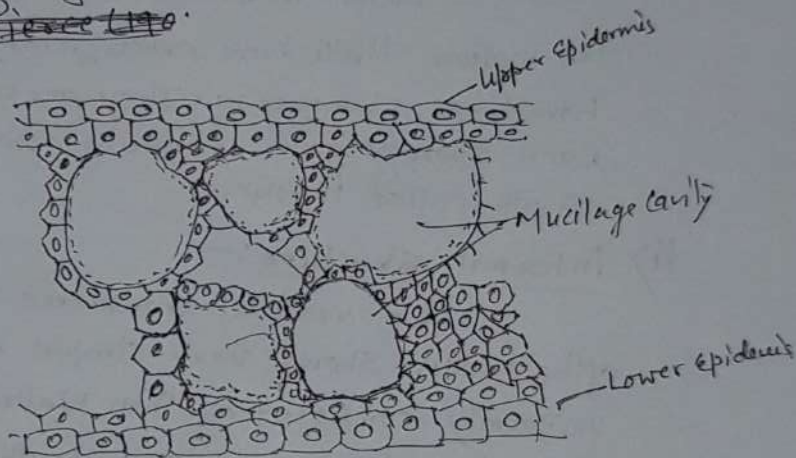


Fig. Internal Structure of Anthoceros

The lowermost cell layer is of lower epidermis. Some cells of lower epidermis extend to form the smooth-walled rhizoids.

* Growth of thallus :-

Initially growth occurs by single apical cell but mature plants have several scattered apical cells on the margin. In this way growth takes place at many points. It forms rosette like thallus.

smooth (A. laevis) or velvety (A. crispulus) or (03)
rough with spines and ridges (A. fusiformis).

* Ventral surface:- V. surface bears many unicellular, smooth-walled rhizoids for anchorage and to absorb water and minerals from the soil. Tuberculate rhizoids, scales or mucilaginous hairs are absent. On the ventral surface many small, rounded, dark bluish/green spots can be seen. These are the mucilage cavities filled with Nostoc colonies.

In the month of September and October the mature thalli have erect, elongated and cylindrical horn like sporogonia. They arise in ~~the~~ clusters. Each sporogonium remains surrounded by a sheath called involucre.

ii) Internal structure:-

The vertical transverse section (VTS) of the thallus shows very simple structure. It is uniformly composed of thin walled parenchymatous cells without zonation. The thickness of the middle region varies in different species. It is 6-8 cells thick in A. laevis, 8-10 cells thick in A. punctatus, and 30-40 cells thick in A. crispulus.

The outer most layer is upper epidermis. The epidermal cells are regularly arranged, smaller in size with large lens shaped chloroplast.

Each cell of thallus has a single, large, discoid or oval chloroplast which enclosed a large pyrenoid. The air chambers and air pores are absent in Anthoceros. However, in few species intercellular cavities ~~are found~~