

DESCRIBE THE GAMETOPHYTE OF ANTHOCEROS.

Anthoceros is cosmopolitan in distribution. It commonly occurs on soil both in the tropical and temperate regions of the world. Its thallus grows in dense patches on the moist soil and wet rocks in all hilly places including Himalays. It belongs to.

Anthocerotopsida

Anthocerotales

Anthocerotaceae

EXTERNAL FEATURES — It is gametophytic plant body is small dark green, translucent, prostrate thallus with irregular branching without definite midrib. It has no definite symmetry i.e. it may be fan shaped with several lobes ~~have~~ having sinuate margin (e.g. *A. erectus*), irregularly lobed (e.g. *A. himalayensis*) or suborbicular with several lobes (e.g. *A. leavis*). The dorsal surface is generally smooth. The ventral surface is occupied by large number of smooth walled rhizoids. The scales are lacking. At various place dark opaque areas are observed denoting the spaces for Nostoc colonies. Several minute slime pores may be detected on this surface.

Anatomical feature of the thallus →

The cellular differentiation in the thallus is negligible. All the cells except the upper and the lower epidermis are parenchymatous having a single chloroplast with a single pyrenoid, or 200-300 minute pyrenoid bodies in its centre. The

Physenoid is peculiar and reminds of an algal cell. It is made up of 25-300 discs or spindle shaped bodies aggregated to form a compact group in the central part of the chloroplast. There are certain cavities known as mucilaginous cavities often inhabited by an endophytic alga - *Nostoc*. They open ventrally through a pore known as slime pore (regarded as rudimentary stomata).

Reproduction → It takes place as follows.

(1) By vegetative reproduction →

It takes place

by the following method -

(a) By progressive death & decay of thallus →

Progressive growth & death of the older part of the thallus reaching dichotomy results in vegetative propagation.

(b) By tubers → In certain sps. eg. *A. laevis*

A. tuberosus, *A. himalayensis*, *A. pearsoni*, the tubers which are thickened structures are found on the margin. These are perennating bodies.

(c) By gemmae → In *A. glandulosus*, *A. formosae*, etc multicellular gemmae are formed either on short stalk or dorsal surface of thallus or along the margins. On detachment, an individual gemma in contact with the soil may produce a new thallus.

(d) By persistent growing apices →

According to Campbell the thallus of the sps *A.*

pearsoni, A. fusiformis, become completely dried up in summers, leaving growing apices with adjacent tissues. These apices face the drought conditions. On the approach of favourable conditions, these apices develop into new thalli.

Sexual reproduction →

Anthoceros may be monoecious or dioecious. The monoecious sps are protandrous. The sex organs i.e. antheridia & archegonia are found embedded in the tissues of the dorsal side of the thallus.

Antheridium → The antheridia lie freely either singly or in group in the antheridial chamber. The antheridia arise on the dorsal surface from the hypodermal cell initial without being protruded. The antheridial initial unlike the other forms divide and redivide to give rise to large number of antheridia from one original initial. It has a club shaped body with a short stalk. The jacket is single layered the cells of which may develop chlorophyll. At maturity the antherozoids are liberated by the rupture of the roof of antheridium.

Each androcyte mothercell divides to give rise to two androcyte. The protoplast of each androcyte metamorphoses into a biflagellate sperm. The antherozoid is A. laevis has a body slightly broader towards the head. Both the flagella are almost of the

same length as the body.

Archegonium

The archegonium remains sunken in the tissues of the thallus on the dorsal surface. They are produced near the growing point. Each archegonium is marked externally by a miculogenous mound around the cover cells as the archegonia are embedded in the tissues of the thallus, the jacket layer of the mature one are not clearly marked, the extreme end of the neck being only protruded when fully developed. Each archegonium consists of a neck canal cell, one venter cell and one egg cell.

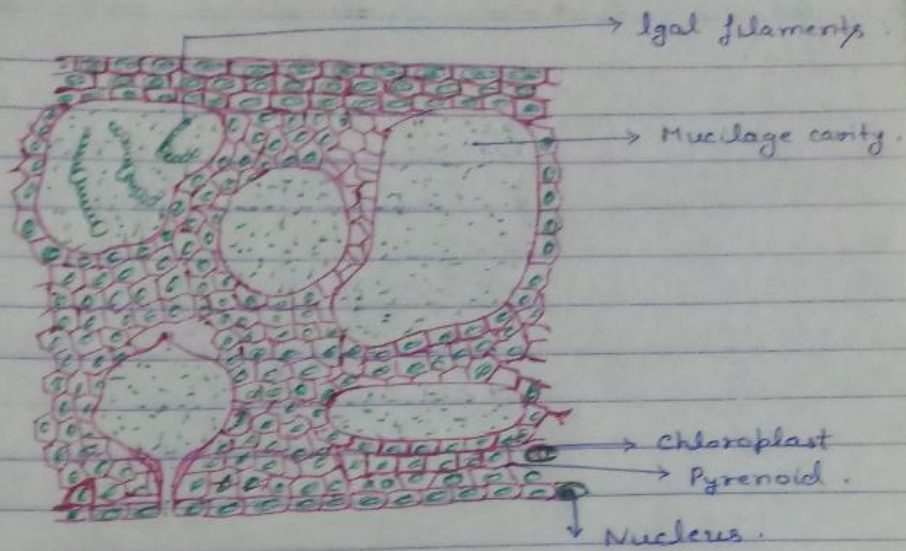
At maturity, neck canal cell and the venter canal cell disorganize. The fertilization of egg is brought about by one of the antherozoid passing down the neck into the venter.

The fertilization initiates the formation of 1st cell generation of the sporophyte in the form of zygote.

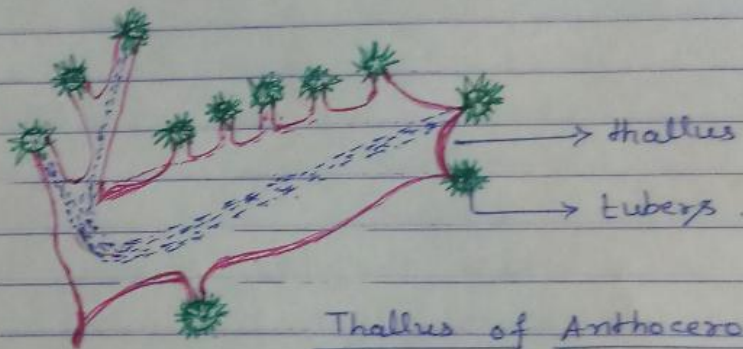


Thallus of *A. crectus*

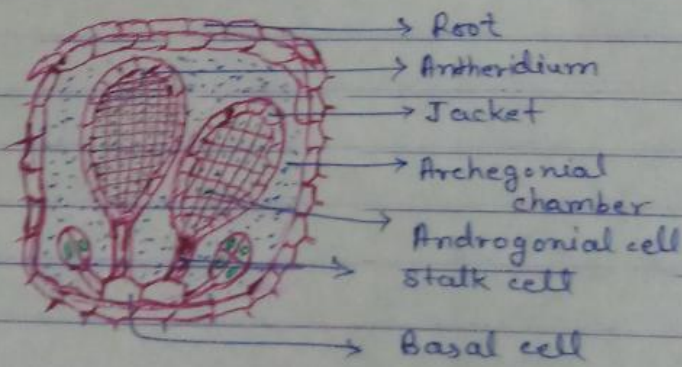
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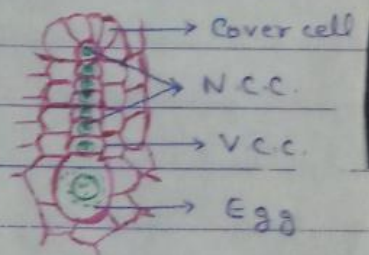
A Section of thallus.



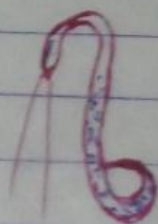
Thallus of Anthoceros with tubers



Antheridial chamber



Archegonium



Antherozoid



Zygote