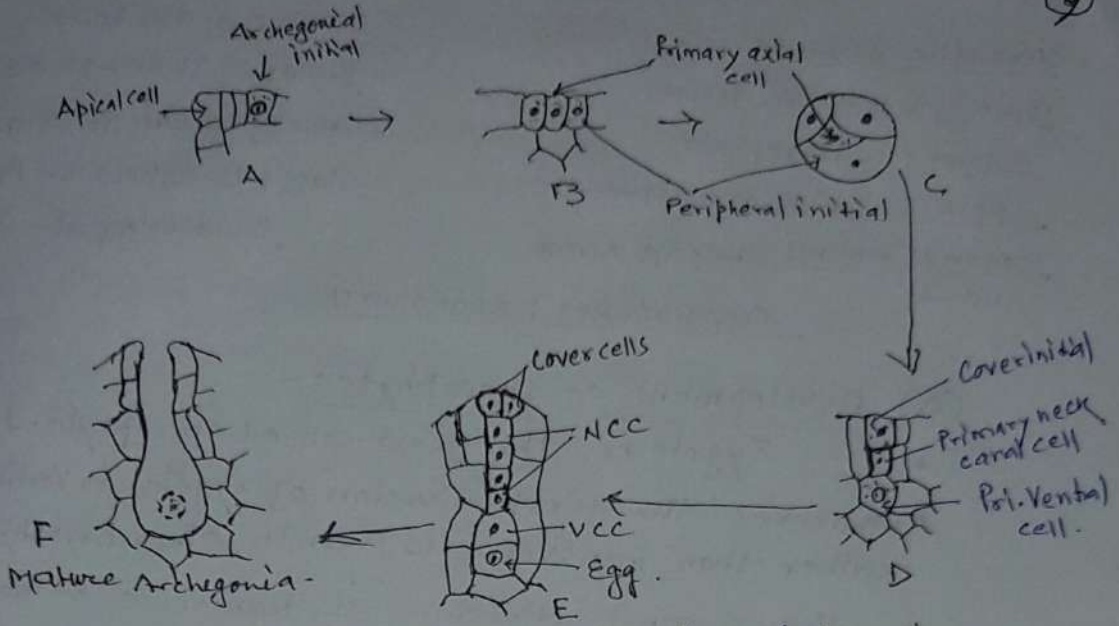

Fig. (A-F): Development of Archegonium.

* The axial cell devides transversely so that a cover cell (at the top), an upper primary canal cell and a lower primary ventral cell are formed.
* The primary ventral cell devides transversely and produces a large egg cell / oosphere at the base and a small ventral canal cell above.
* The primary canal cell devides transversely to produce transverse row of four neck canal cells.
* The Cover cell devides vertically twice to produce four cover cells.
* At maturity the NCC & VCC dissolves so that a passage is formed for antherozoids.

* Fertilization:- Antherozoids are attracted towards the archegonium and enter inside through neck canal. One of them fuses with the egg so that zygote is formed. It increases in size and fills the cavity of Venter. It secretes a wall and becomes oospore. With the formation of zygote, diploid sporophytic generation begins.

On Line Study Material (e-content)

Name of College: S.S. College, J'bad
Name of Department: Botany
Subject: Bryophyta
Topic: Anthoceros Repro.
Medium of Teachg: Whats App & college Web-site

Date: 05.08.2020
Time: 11.00 - 12.00
Name of the Teacher: Dr. S.S. Shaw
Class: B.Sc (Bot) H-PI
Biotechnology Sub-PI.

Anthoceros Reproduction

4) Reproduction:-

Anthoceros reproduces both by vegetative and sexual process of reproduction.

i) Vegetative Reproduction:-

Vegetative reproduction takes place by the following process —

(a) Fragmentation/By Progressive death and decay of the older parts.

When the cells in the basal portion of the thallus die and disorganize, the apical lobes become separated. Each lobe grows into new thallus. This method is not so common in Anthoceros as in liverworts.

(b) Gemmae:- In A. glandulosus, A. formosae and A. propaguliferus gemmae are formed on the upper surface and along the margin of the thallus. The detached gemma grows into a new plant.

(c) Tubers:- some species of Anthoceros e.g., A. himalayensis, A. tuberosus, A. hallii etc are exposed to draught. This is why round tubers are formed along margin. In dry season, the thallus dies leaving behind the tubers. The tubers tides over the adverse condition and with the onset of favourable condition, each tuber develops into a new thallus. The tubers have outer 2-3 layers of corky hyaline cells which encloses Oil globules, Starch grains and aleurone granules.

(d) Persistent Growth Apices :-

In A. pearsoni and A. fusiformis, only the apices persists during long summer draught. In favourable condition, the cells of persistent apices develop in to new thallus. It is more a method of perennation then multiplication.

(e) Apospory :-

Schwarzenbach (1926) reported that Anthoceros thallus is produced directly from the vegetative cells of the sporangium (i.e. from intercalary meristematic zone, sub-epidermal and sporogenous region) This phenomenon is called apospory. Here, the thalli are diploid but normal in appearance e.g., A. laevis.

(ii) Sexual Reproduction :-

In Anthoceros, sexual reproduction is oogamous. Male reproductive bodies are known as antheridia and female as archegonia. Some species of Anthoceros like A. longii, A. gollani, A. fusiformis, A. crispulus, A. himalayensis are monoecious while some species like A. erectus, A. hallii, A. chambensis, A. laevis etc. are dioecious. The monoecious species are protandrous i.e., antheridia mature before archegonia. Sex organs are deeply embedded in the thallus.

a) Antheridia :-

Antheridia are found on the upper side of the thallus in a small cavities (= antheridial cavity). They are found in groups of 2-4. The antheridial cavity remains completely covered by a double layer of cells. They have no opening to the outside.

Date

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Each antheridium has a multicellular stalk and a globose main body which has single called thick jacket. Inside antheridia mass of androgonial cells are found which give rise to biflagellate antherozoids.

* Development of Antheridia :-

Antheridium develops from a single superficial cell of the thallus. This cell divides by a transverse division in to an outer roof cell and an inner antheridial initial cell. A space filled with mucilage is formed between them. The inner cell is pushed towards the base of cavity. The outer cell devides to form roof of the cavity.

The antheridial initial either directly develops into a single antheridium or it may devides by one or two vertical division so that two or four (sometimes more as in A. erectus) cells are formed. Each cell develops in to antheridium giving rise to 2-4 antheridia in each cavity.

Each antheridial cell devides by a transverse div. and produces a primary stalk cell at the base and a primary antheridial cell at the top. The primary stalk cell devides to form multicellular stalk. On the other hand the primary antheridial cell after many vertical and periclinal divisions gives rise to antheridia with antherozoids.

* Release of antherozoids :—

At maturity, the roof of the antheridial cavity and antheridial wall ruptures so that antherozoids are released in the surrounding water.

Teacher's Signature

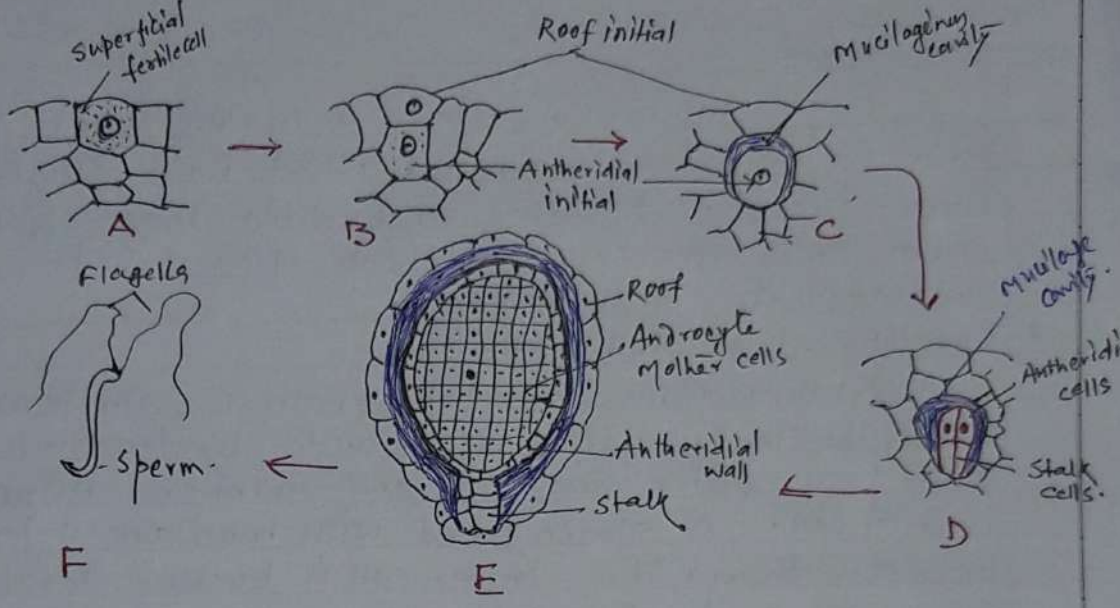

Fig. (A-F) Development of Antheridia in Anthoceros.

b) Archegonia :-

Archegonia develops ~~develops~~ on the dorsal surface. The place of an archegonia on the thallus can be identified by the presence of a mucilage mound.

* Structure - A mature archegonium consists of two to four cover cells, an axial row of four to six neck canal cells, a venter canal cell and an egg. There is no stalk and they are embedded in the thallus and are in direct contact with vegetative cells.

* Development of Archegonium :-

Each archegonium develops from a single superficial cell known as archegonial initial. It devides by three vertical division to produce a large axial cell & three peripheral jacket initials.