

ARCHEGONIA IN BRYOPHYTES

PAPER-I
Group-B

TDC Part-I (Hons.)
(2019-22)

Introduction:

Archegonia are female sex organs of bryophytes which are usually multicellular structures borne by the gametophytic thallus. Antheridia (σ sex organs) and archegonia may be borne by the same thallus (monoecious) or by different thalli (dioecious). Structurally they have usually a long neck and a basal swollen (bulbous) venter. The archegonial neck has variable number of neck canal cells in different members of the bryophytes while the venter has a ventral canal cell and an ovum/egg at the bottom. Archegonia may be borne directly on the thallus or may develop on specialized branches or stalks. There are some specialities in archegonial support and defence in some higher members of bryophytes.

A brief account of archegonia in the common members of bryophytes is given below.

Archegonial Features of Common Bryophytes:

Riccia

(i) Archegonia lie in deep pits or furrows on the thallus and are partially enclosed by the outgrowth of the surrounding tissues.

(ii) Each archegonium is a flask-shaped body with a very short stalk and consists of an enlarged basal venter and an elongated tubular neck.

(iii) The venter contains a ventral canal cell and a large oosphere (egg/ovum), while the neck has a number of neck canal cells.

(iv) When the archegonium matures, neck canal cells are dissolved completely so that

...Contd. p. 2

(2)
a passage for the movement of antherozoids is formed.

Marchantia

(i) Here the archegonia are a bit advanced and structurally elaborate.

(ii) The female receptacle borne on a female branch (archegoniophore or carpocephalum) is divided into rays, and the archegonia at first develop on the upper surface, but due to the growth of the central part of the upper side of the disc, the archegonia become inverted with the neck downwards.

- The youngest archegonium is found towards the centre and the oldest one towards the extremity of the ray.

(iii) Each archegonium has a long narrow neck with several neck canal cells and a swollen venter with a ventral canal cell and an egg.

(iv) Neck canal cells degenerate before fertilization to facilitate entry of the spermatozooids.

Anthoceros

(i) Archegonia develop singly and remain closely embedded in the thallus.

(ii) Vegetative cells of the thallus are confluent with a part of the neck and venter of each archegonium, the extreme end of the neck being only protruding.

(iii) When fully developed, there is a single axial row of cells in each archegonium consisting of 4-6 neck canal cells, a ventral canal cell and an egg cell.

(iv) At maturity, the neck canal cells and the ventral canal cell disorganize to make passage for the incoming antherozoids for fertilization.

Sphagnum

(i) Archegonia are borne at the apices of the archegonial branches.

(ii) Usually there are three archegonia at the apex of each branch.

(iii) A mature archegonium is relatively large with a stalk, a long neck and a massive venter.

(iv) The neck contains several neck canal cells, whereas the venter has one ventral canal cell and an egg.

(v) Neck canal cells and ventral canal cell disintegrate in the mature archegonium ready for fertilization to facilitate entry and movement of incoming antherozoids.

Polytrichum

(i) Polytrichum is usually dioecious and antheridia and archegonia are borne separately at the apices of male and female gametophores.

(ii) Archegonia are borne in a cluster at the apex of the female gametophore and the perichaetial leaves usually remain folded over them as a protective envelope.

(iii) Each archegonium is flask-shaped with a very short stalk and consists of a basal swollen venter, and a comparatively long upper neck.

(iv) The venter contains a ventral canal cell and the oosphere (egg) while the neck has a variable number of neck canal cells.

(v) At maturity of the archegonium, disorganization of the neck canal cells form a passage for the entry of the antherozoids to effect fertilization.

N.B. - Figs. to follow

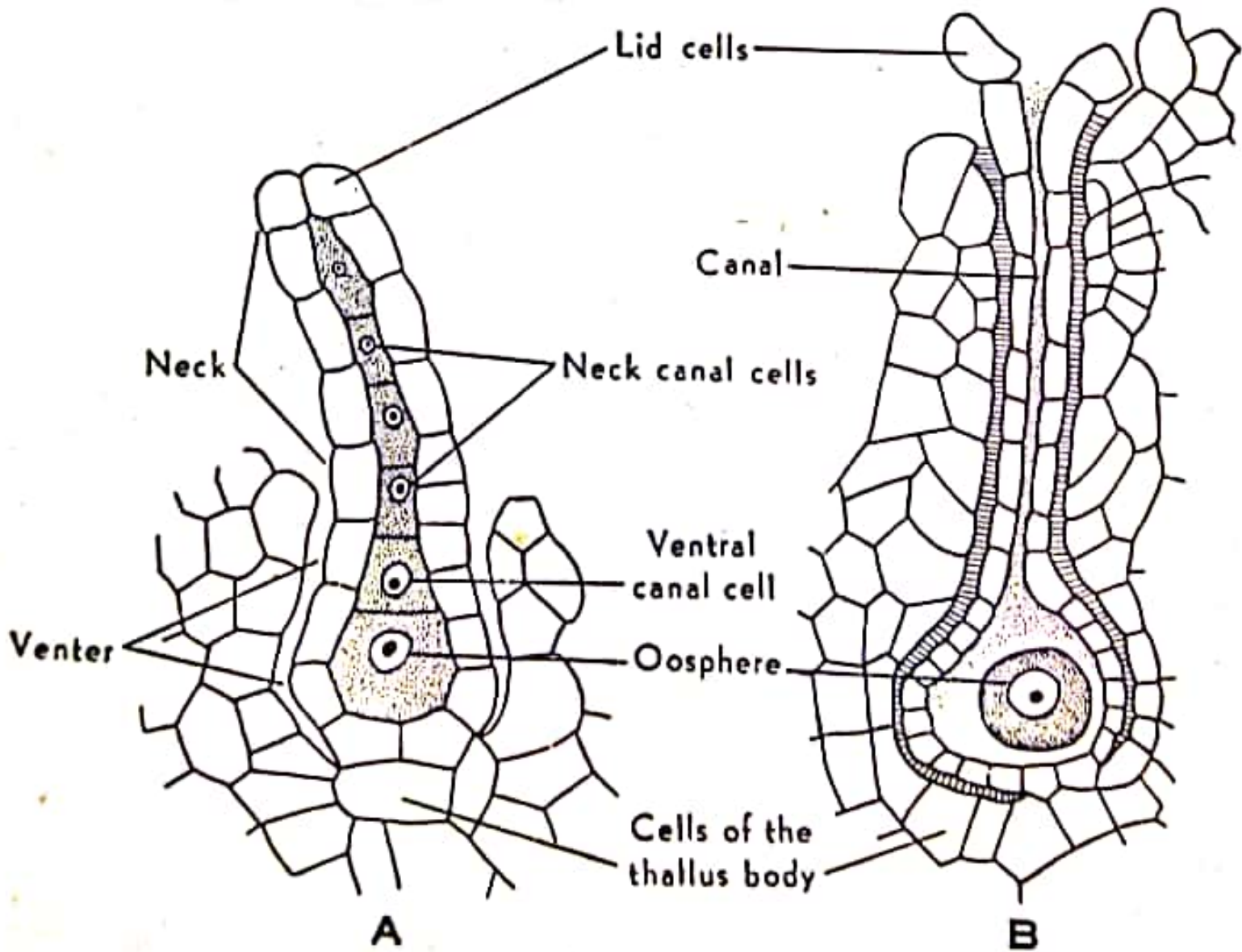


Fig. 239. *Riccia*.
 A, A mature archegonium; B, An archegonium ready for fertilization.

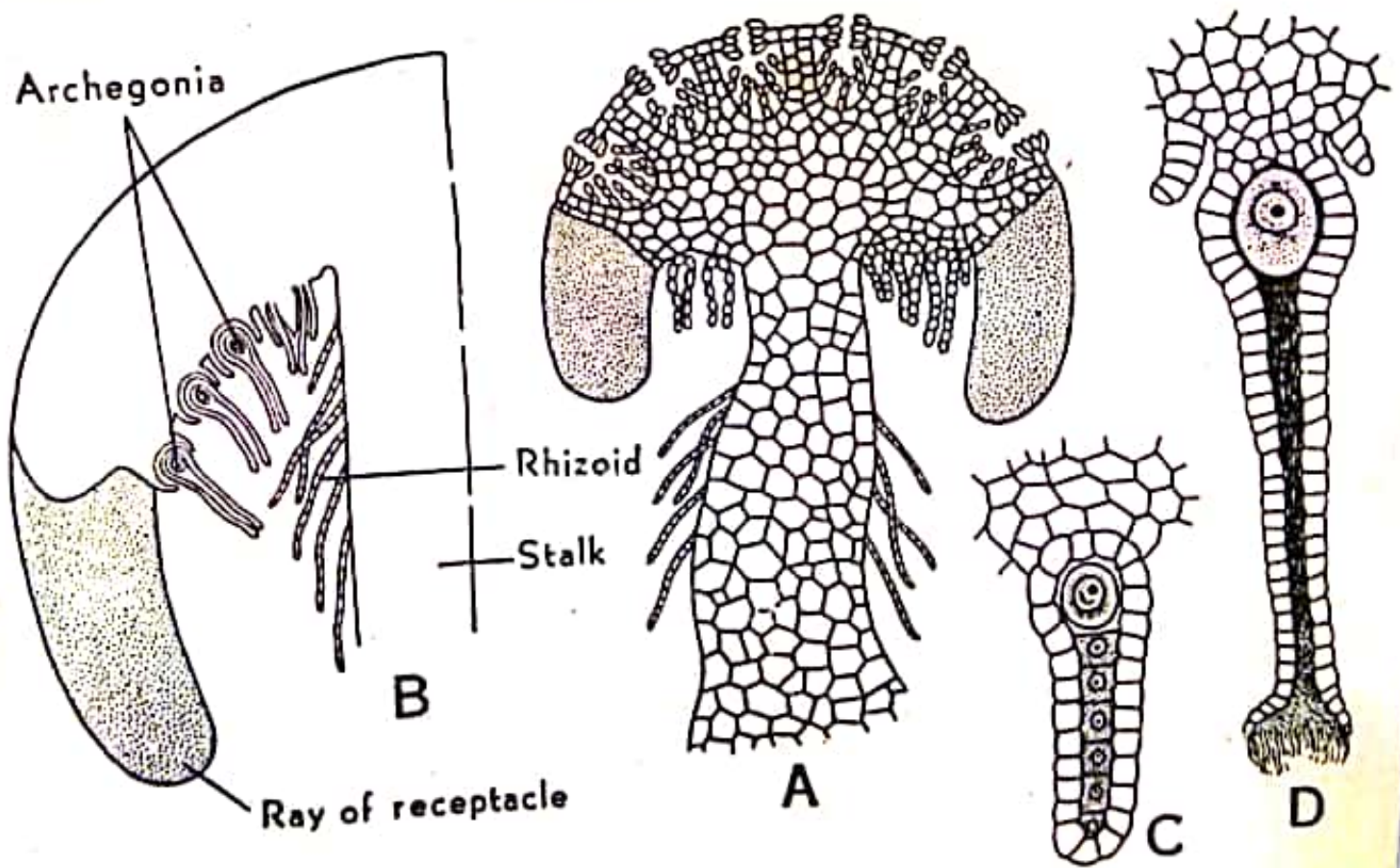
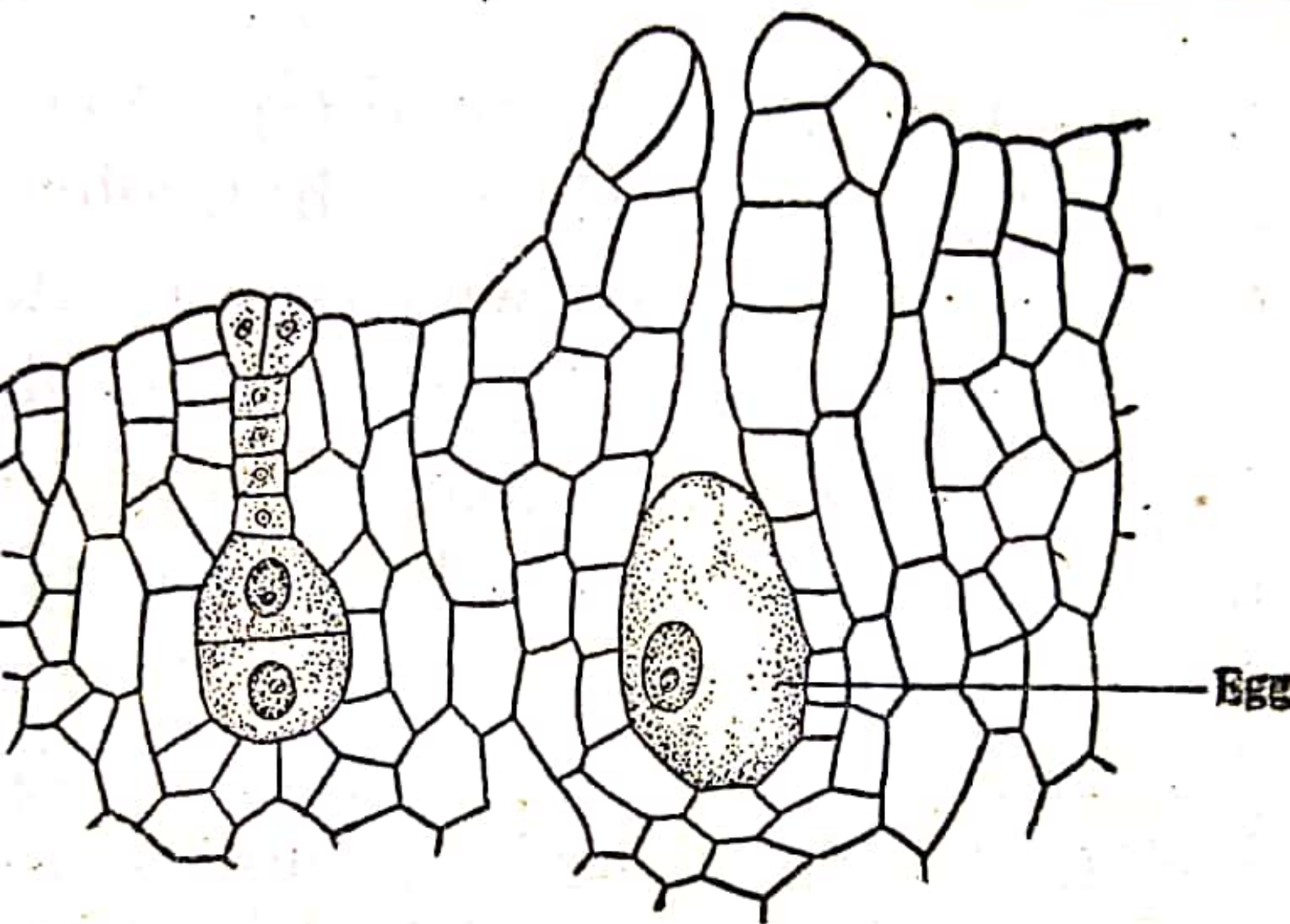


Fig. 245. *Marchantia*.
 A, A v.s. of a female receptacle showing the position of the inverted archegonia; B, Diagrammatic representation of half of the same; C, A young archegonium; D, A mature archegonium ready for fertilization.



**Fig. 262. *Anthoceros*.
Archegonia, young and mature.**

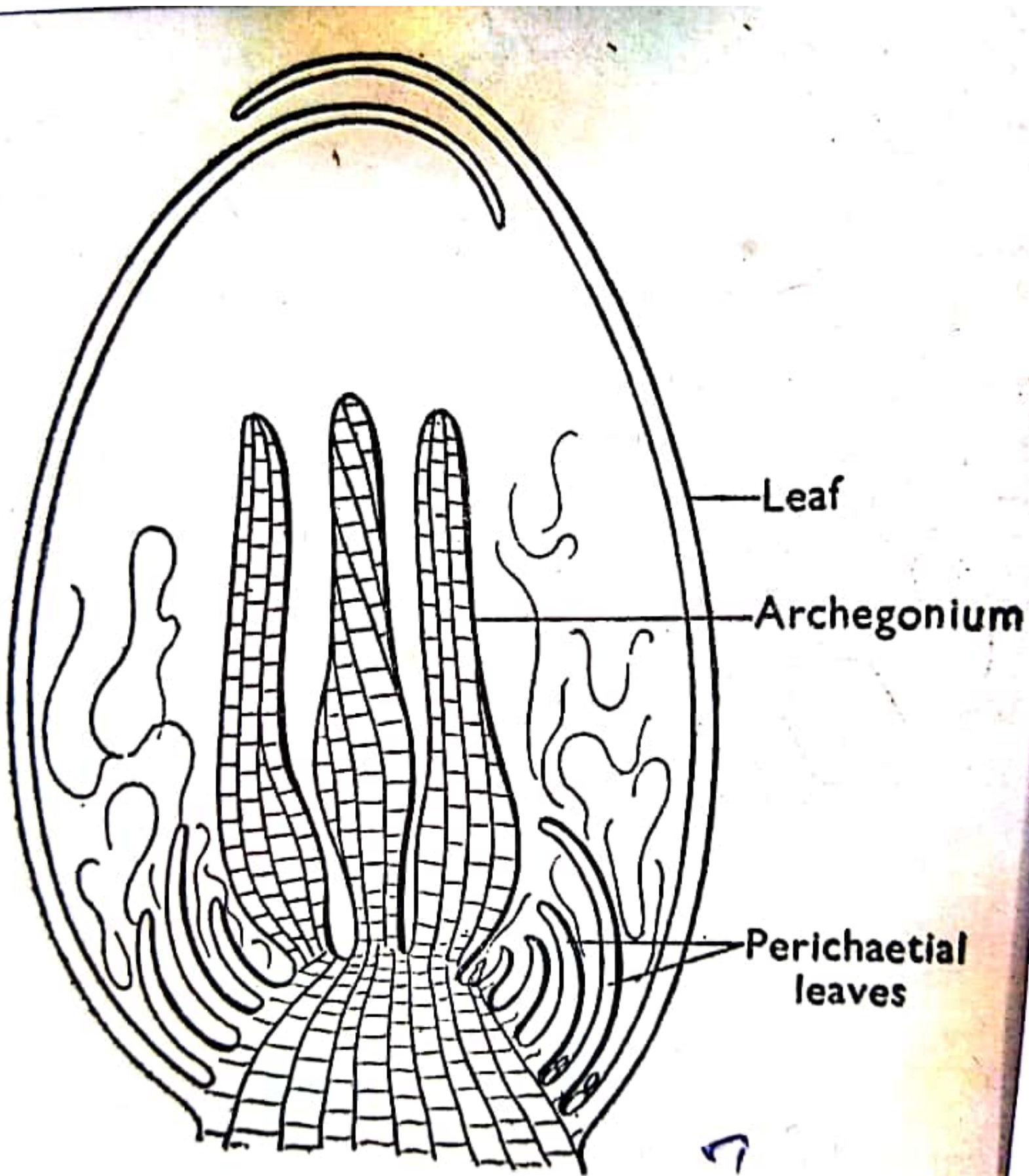


Fig. 273. *Sphagnum*.
A cluster of archegonia.

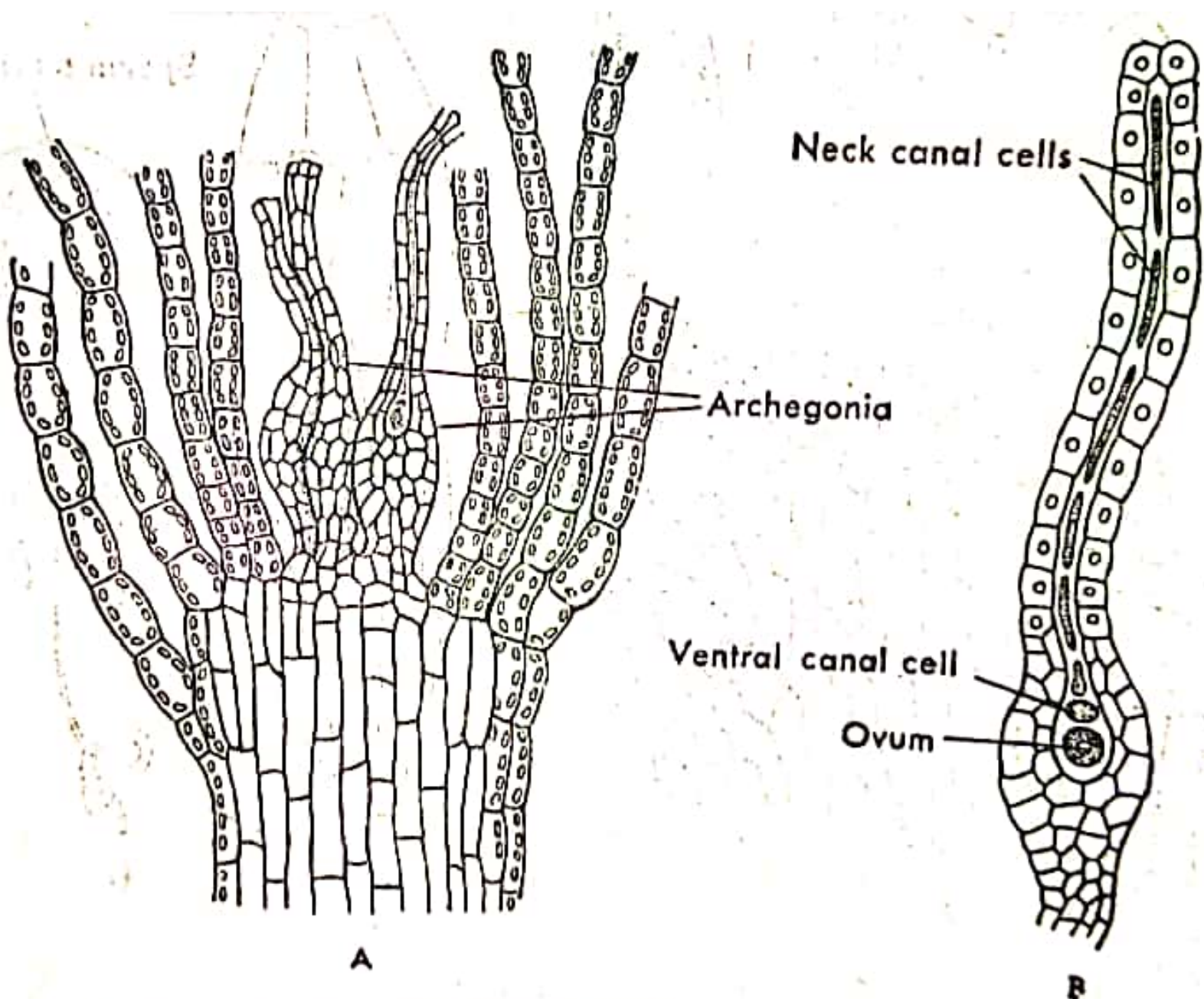


Fig. 281. *Polytrichum*.

A, Longitudinal section through the apex of a female plant showing archegonia; B, A mature archegonium.