

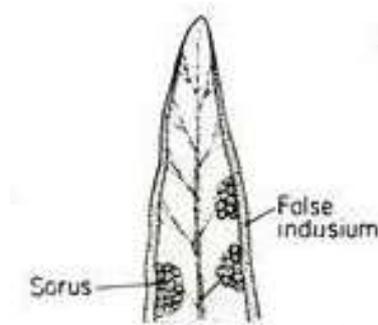
Dr. Ritu Pandey

Archegoniatae

Monday (1:45 to 2:45 PM)

***Pteris* (Reproduction)**

Pteris is a homosporous fern. The sorus of *Pteris* is called coenosorus. Coenosori are marginal, borne continuously on a vascular commissure connected with vein ends. Thus the sporangia of *Pteris* form a continuous linear sorus along the margin, hence the individuality of sori is lost.



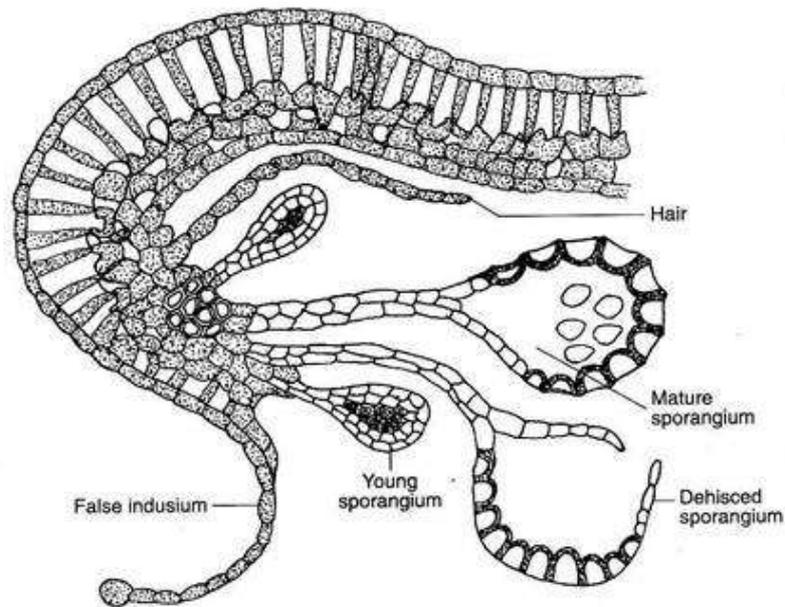
The coenosori are protected by the reflexed margin (false indusium) of the pinnae. Sori are of mixed type intermingled with many sterile hairs in between the sporangia.

Development of Sporangium:

The development of sporangium in *Pteris* is of leptosporangiate type. (detailed development not in course)

Structure of a Mature Sporangium:

A mature sporangium has a long stalk that terminates in a capsule.



The jacket of the capsule is single-layered, but with three different types of cells:

- (1) A thick walled vertical annulus incompletely overarches the sporangium,
- (2) A thin-walled radially arranged stomium, and
- (3) Large parenchymatous cells with undulated walls.

The capsule contains many spores. All spores are structurally and functionally alike; hence *Pteris* is a homosporous pteridophyte. Spores are triangular in shape with trilete aperture, bounded by two walls. The outer wall, exine, is variously ornamented.

The sporangium dehisces transversely along the stomium due to the shrinkage of annular cells. The spores are dispersed through air to a moderate distance.

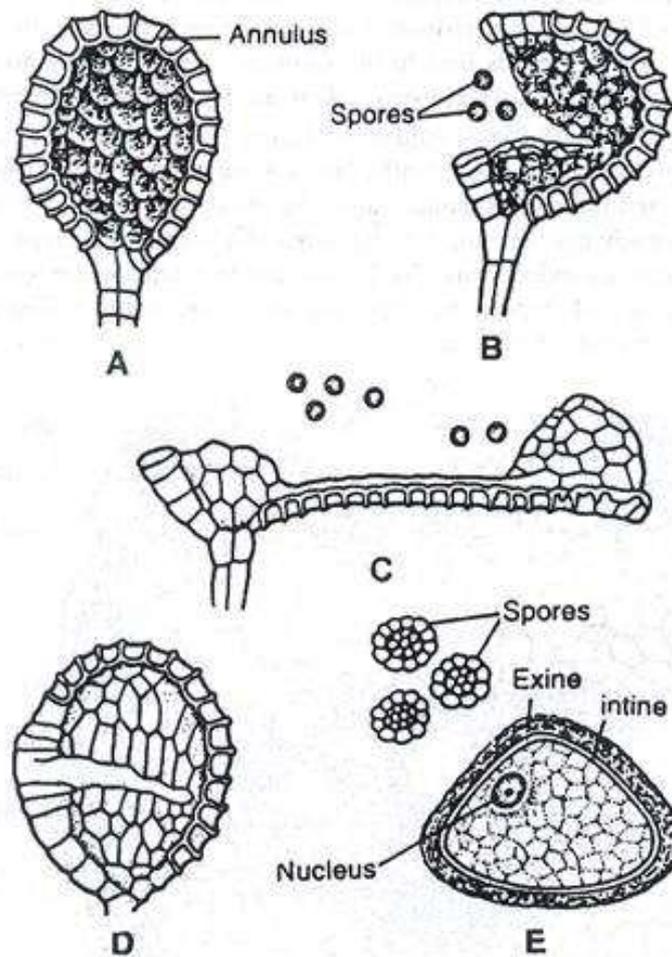


Fig. 31.6. (A–D). Structure and dehiscence of sporangium in *Pteris vittata* ; E–F. Structure of spore.

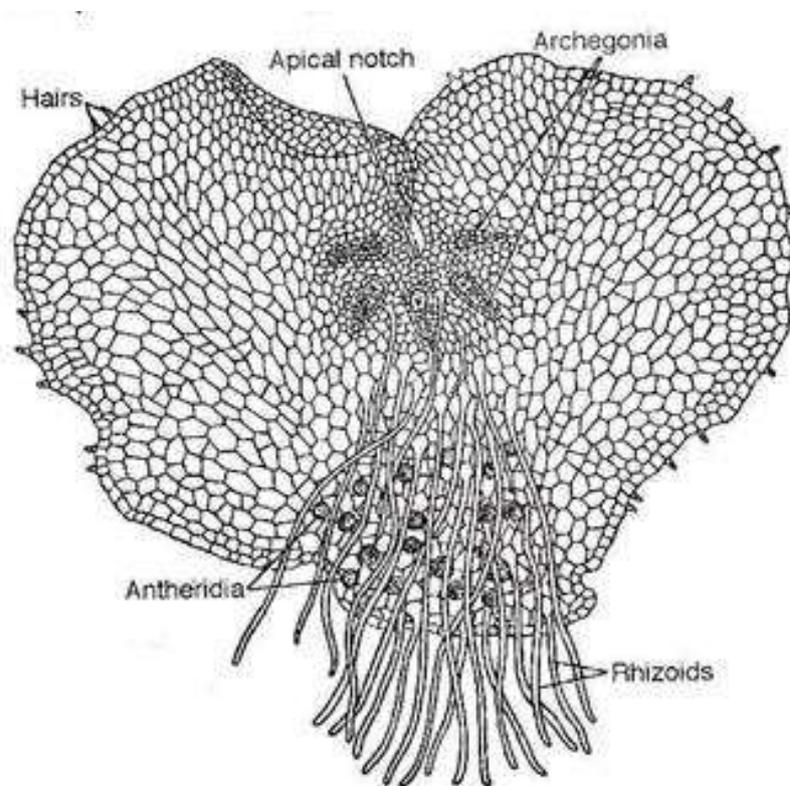
Gametophyte:

The spores germinate after falling on a suitable substratum. Initially the spore wall (exine) ruptures and the inner contents come out in the form of a germ tube and subsequently by a transverse division in the germ tube forms the first rhizoid and the first prothallial cell. The prothallial cell divides to form a small filament having an apical terminal cell with two cutting faces.

The apical cell further divides and a spatulate prothallus is formed first. Finally a mature prothallus is formed which becomes cordate, dorsiventrally flattened, aerial and photosynthetic.

The prothallus is made up of parenchymatous cells which are single-celled thick towards the margin and many-celled thick towards the centre. The growing point are located in the apical notch. Rhizoids are formed over the ventral surface.

The prothallus is monoecious, protandrous. Antheridia appear first and are confined to the basal central or lateral regions among the rhizoids. Archegonia develop near the apical notch.



Fertilisation:

The antheridium at maturity absorbs water and swells. Due to the increase in pressure within the antheridium the cover cells split apart releasing the antherozoids in a thin film of water present on the surface of the prothallus. At the same time the ventral canal cell, the neck canal cell and the neck cells at the top disintegrate forming

an open passage for the antherozoids to come towards the egg and, eventually, one of the antherozoids fuses with the egg to form the zygote. Zygote divides to form embryo. In the young embryo the root and cotyledon grow more rapidly than the shoot. The root pierces the prothallus and establishes the plant in the soil. Later, the first leaf develops.