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Pteris

This is a cosmopolitan fern being distributed in almost all geographical regions. *Pteris* however, prefers tropical and sub-tropical climates. Plants usually grow in well drained places or in the crevices of rocks. They are very common along the slopes of hills and can be seen even at 1200 metres above sea level.

There are about 250-280 species reported for the genus. Some of the common Indian species are *P. quadriaurita, P.critica, P.vittata, P.pellucida, P.wallichiana, P.stenophylla, P.biaurita*, etc.

Structure of *Pteris:*

Sporophyte:

The main sporophytic plant body is differentiated into root, rhizomatous stem and leaves (Fig. 7.102A).

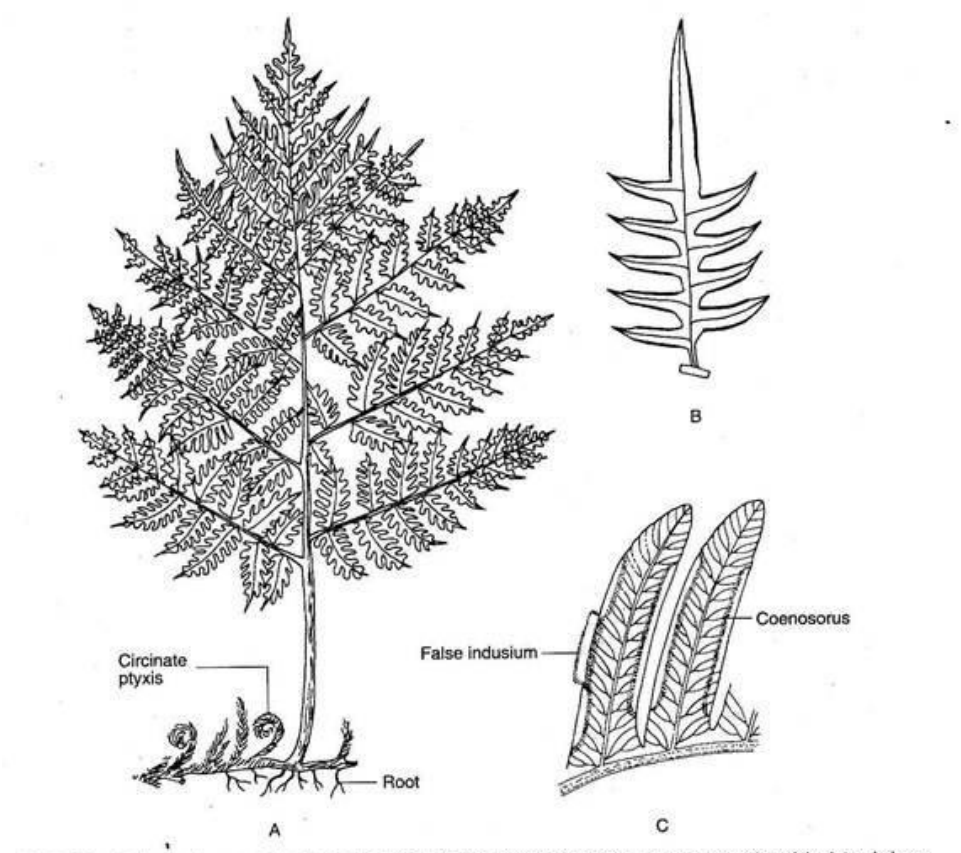

Fig. 7.102 : *Pteris* : A. A sporophyte showing habit, B. A lateral pinna, C. Abaxial surface of a portion of the lateral pinna showing two pinnules

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1. Root:

The primary root is ephemeral, and is replaced by a large number of adventitious roots developed all over the surface of the rhizome. The roots are small and branched (Fig. 7.102A).

The T.S. of root shows an outer piliferous layer, a cortex and a central stele. The cortex is differentiated into a parenchymatous outer cortex and a sclerenchymatous inner cortex. The stele is protostelic with diarch and exarch xylem.

2. Rhizome:

The rhizome or stem may be creeping (P. *grandiflora*) or erect (*P. cretica, P. vittata*) which may or may not show branching. The rhizome is differentiated into nodes and internodes and its entire surface is covered with scales. The growing point of rhizome is covered with ramenta.

3. Leaf:

The leaves are borne on the upper surface of the rhizome. When young the leaves are spirally coiled and show circinate vernation that is typical of true ferns (Fig. 7.102A). The leaves are unipinnately or multipinnately compound or decompound with a long rachis (Fig. 7-.102B).

The pinnae are small near the base as well as towards the apex, while they are large towards the middle. The pinnae are very often coriaceous. All leaves are fertile, bearing sori along the ventral margin of pinnae, except the apices of the segments.

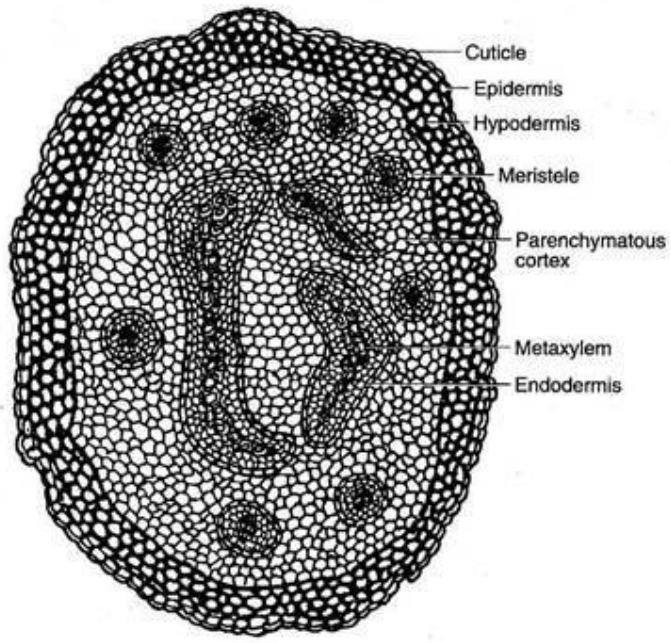

Fig. 7.103 : *Pteris*. T.S. of rhizome

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The rachis is traversed by a single C/U/V-shaped leaf trace. The lamina is bifacial, hypostomatic. Mesophyll cells may or may not be differentiated. A concentric vascular bundle with distinct bundle sheath is present in the midrib.

Reproductive Structures:

Spore-Producing Organ:

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 (Fig. 7.104).

Structure of a Mature Sporangium:

A mature sporangium has a long stalk that terminates in a capsule (Fig. 7.106).

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.

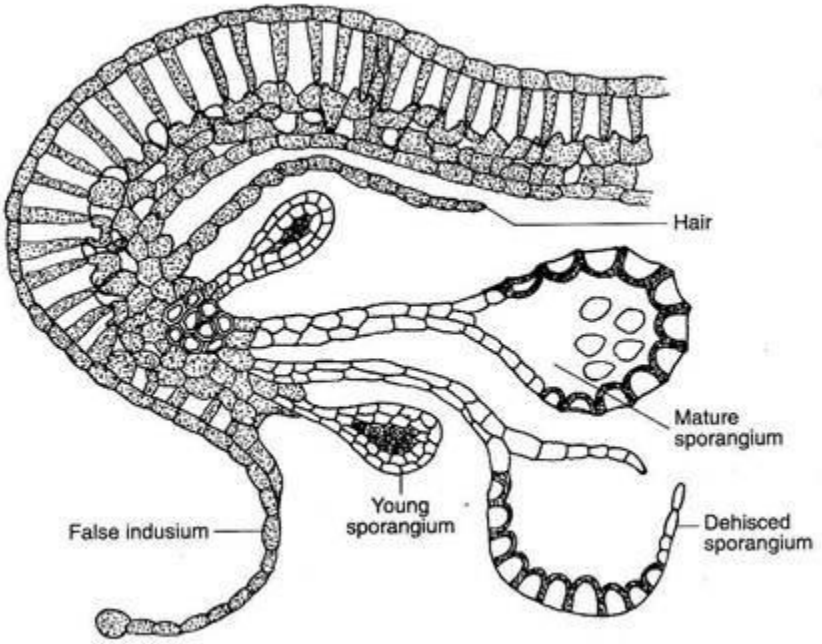

Fig. 7.104 : *Pteris* : T.S. of pinnule showing sorus (a portion)

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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 (Fig. 7.104). The spores are dispersed through air to a moderate distance.

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 spathulate prothallus is formed first. Finally a mature prothallus is formed which becomes cordate, dorsiventrally flattened, aerial and photosynthetic (Fig. 7.107).

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.

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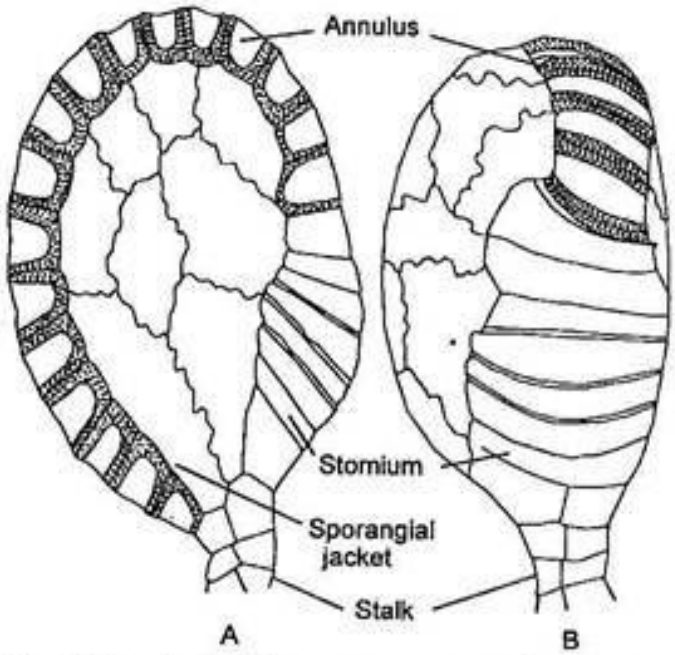

Fig. 7.106 : *Pteris* : Mature sporangium. A. Front view, B. Side view

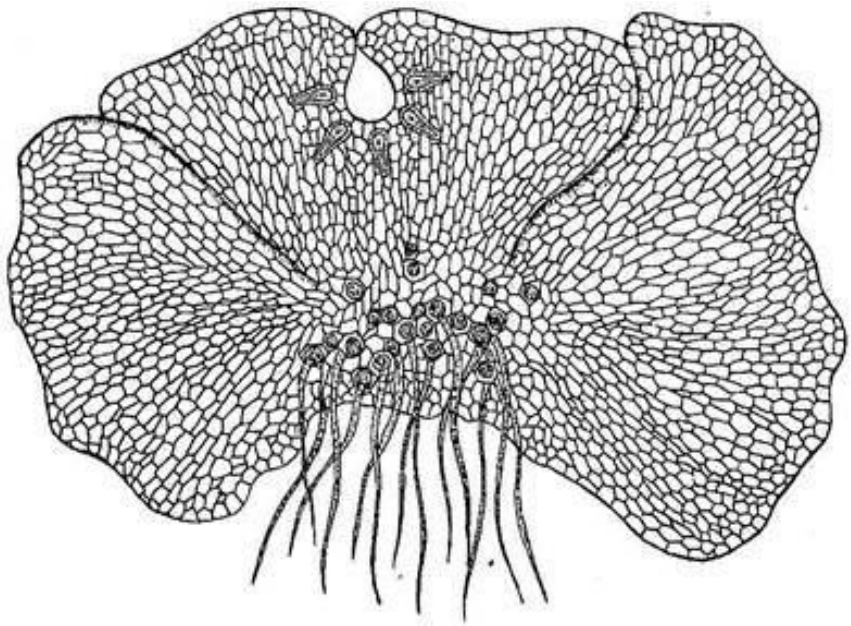

Fig. 7.107 : *Pteris* : Gametophyte

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The life cycle of *Pteris*

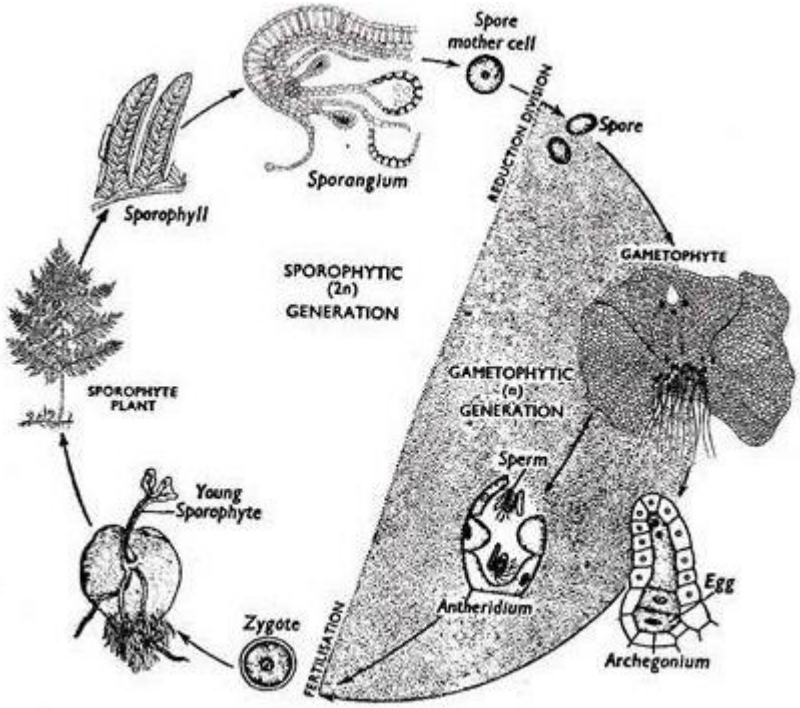

Fig. 7.110 : Life cycle of *Pteris*

Source: Internet Archives