

V MORPHOLOGY OF PTERIS VITTATA

Explanation to Plate I

A complete Plant

Plate - I



Plate - II



Fig -1

Fig -2



Text - Fig - I

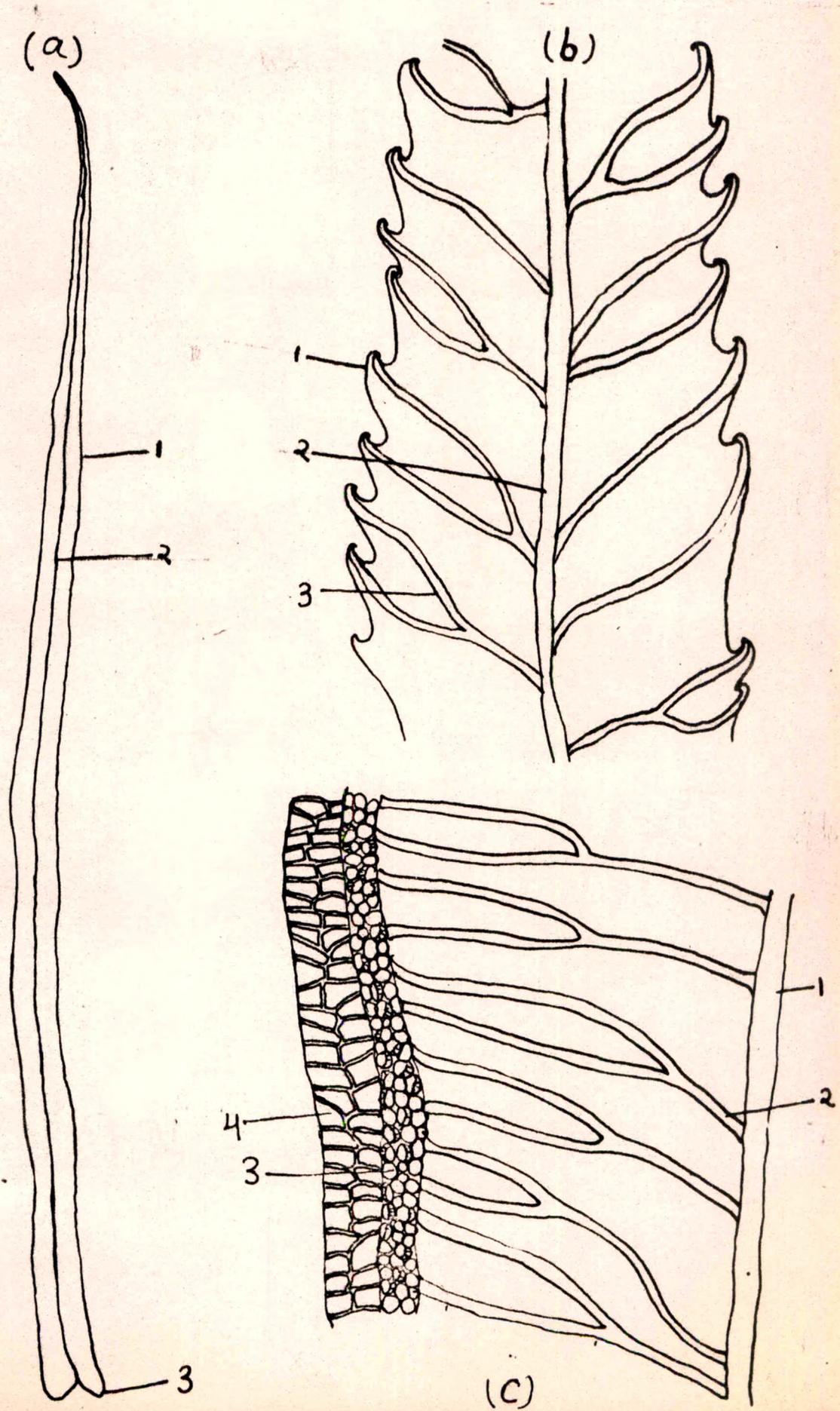


Plate-III

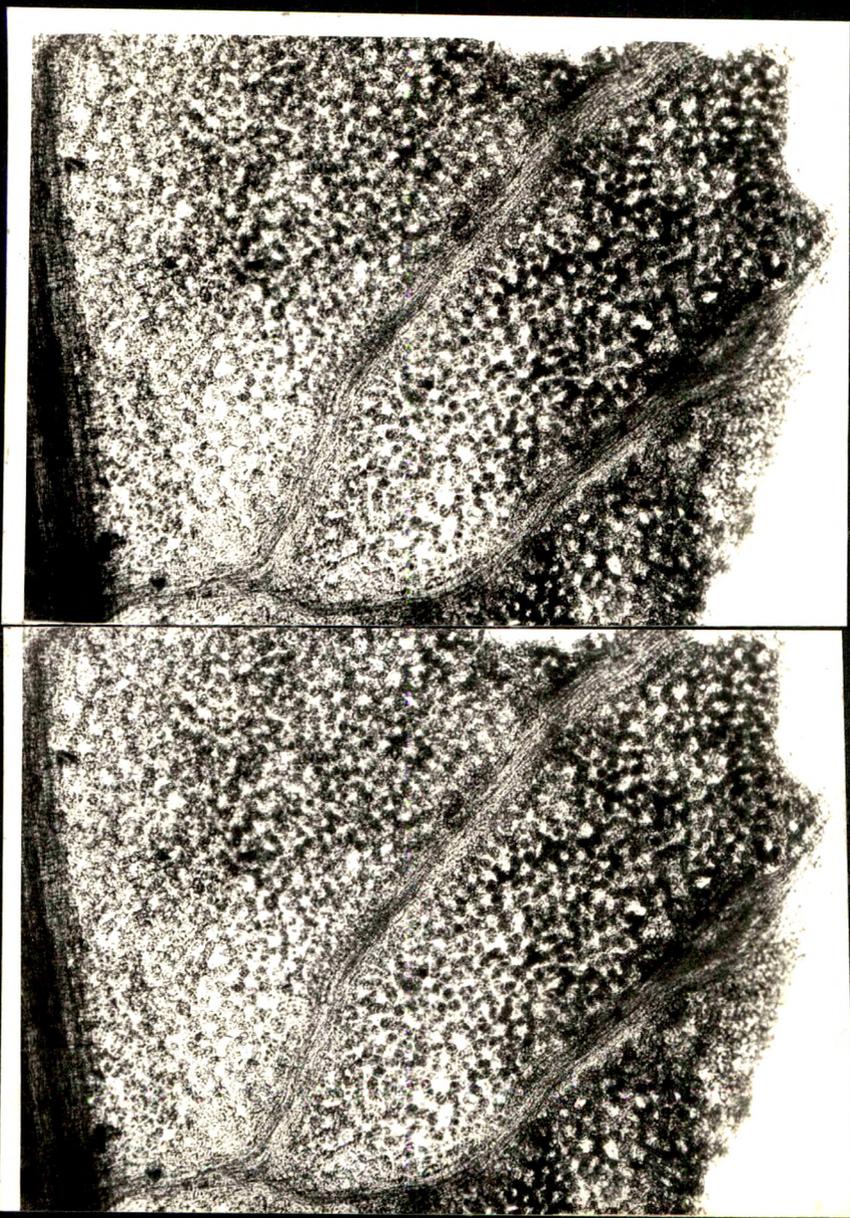


Plate - IV

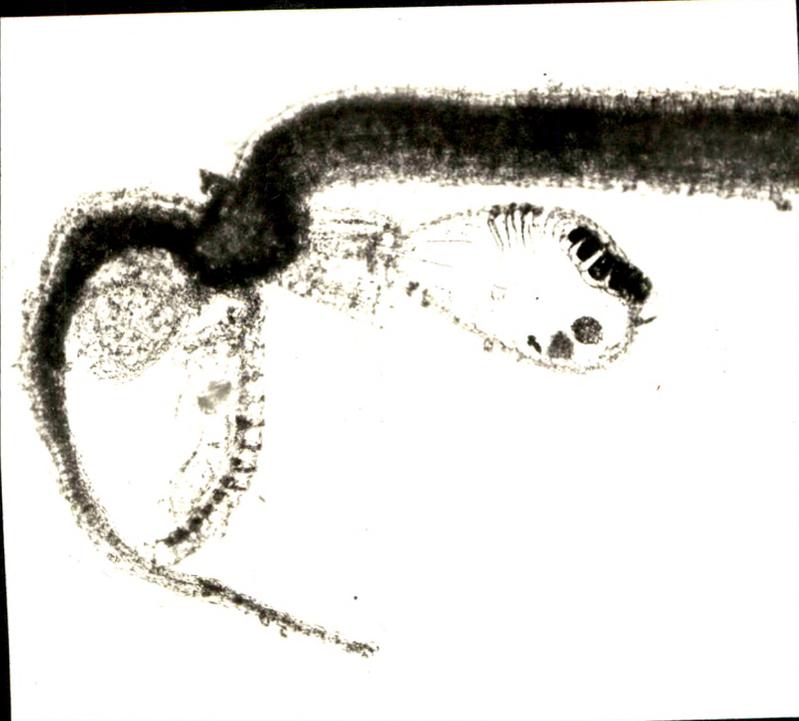


Fig - 1

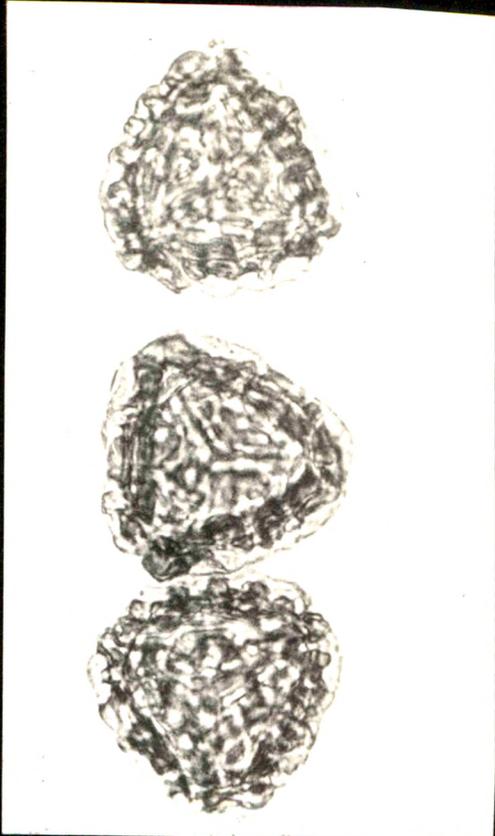


Fig - 2

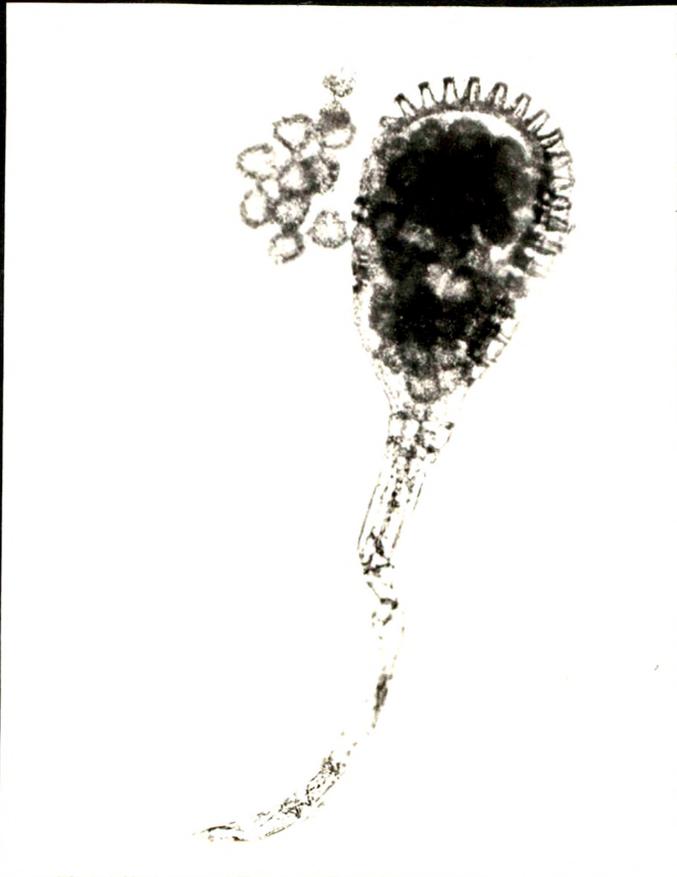


Fig - 3

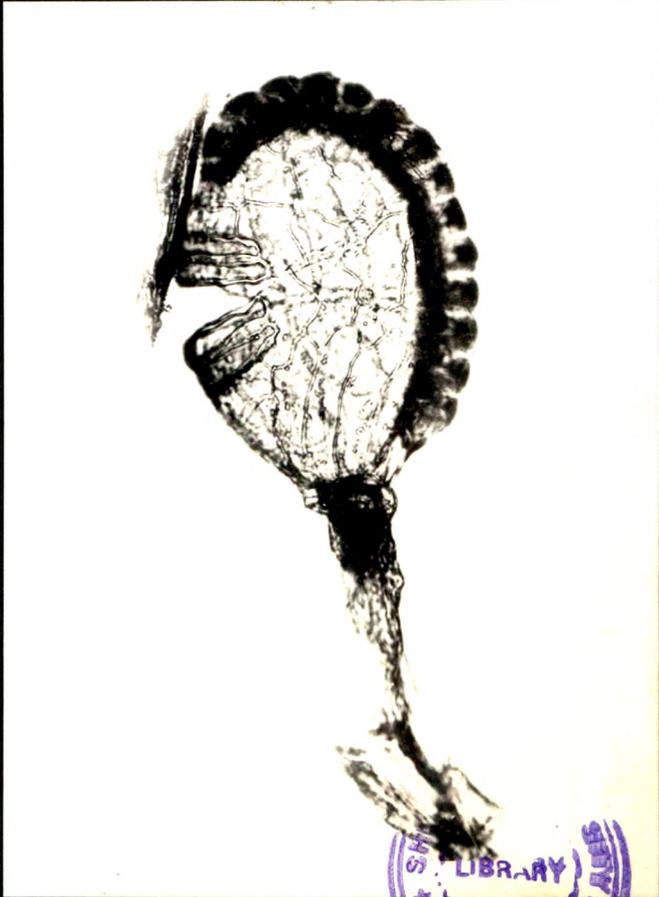


Fig - 4

Explanation to Plate II (1-2)

1) A complete Plant

2) A complete Frond

Explanation to Text Fig. I (a - c)

Text Fig. I Morphology of Pinnule

- a) A single pinnule (x 28)
- b) A part of sterile pinnule showing dichotomous venation (x 20)
 - 1) Margin.
 - 2) Midrib.
 - 3) Lateral vein.
- c) A part of fertile pinnule with marginal sori (x 20)
 - 1) Midrib
 - 2) Lateral vein
 - 3) Sporangia
 - 4) Indusium

Explanation to Plate III

- 1) A part of sterile pinnule showing dichotomous venation.

Explanation to Plate IV (1 - 4)

- 1) Section passing through sorus.
- 2) Spores
- 3) and 4) sporangia showing annulus, stomium,
spores and stalk.

Morphology :

It is a shrubby plant reaching to the height of nearly 4 feet. (Plate I, II, Fig. -1).

Rhizome : The rhizome is creeping, slender and rarely branching. It is dark brown in colour. The young parts are soft but become hard as they mature. On the ventral surface of rhizome adventitious roots are present. The spirally arranged leaves, those on the lower side, turn upward and form 2 spaced rows on the upper surface of the rhizome. Both rhizome and frond bases are densely covered with scales which remain persistent throughout the life of the plant.

Roots : Numerous adventitious roots are borne on the ventral surface of rhizome. They are continuous with rhizome and of uniform shape and colour. All roots bear several, closely branched lateral roots and are densely covered with root hairs. The blackish colour of the root is due to the sheet of dark, thick walled, sclerenchymatous cells situated below the root epidermis.

Leaf : From the horizontal and creeping rhizome number of fronds arise which are spirally disposed and form 2 spaced rows on the dorsal surface of rhizome. The young fronds show circinate venation characteristic of the fern and are densely covered with scales, which are similar to the scales on the rhizome. The mature frond reach upto the length of nearly 3.5 feet.

Rachis is quadrangular, brownish in colour. At the basal region it is hard, brown in colour and covered with scales while at the apical region it is green, herbaceous, grooved and covered with scales and hairs.

The average length of petiole is 7.6". The basal pinnae are small, reduced in size. The arrangement is unipinnate and opposite at the basal region while slightly alternate at the apical portion of the rachis. (Plate II, Fig.2).

Pinnules are sessile, linear, lanceolate, elongated, gradually acuminate, with cordate to auriculate base. The average length and breadth of the pinnule is 20 cm and 1 cm. The average length and breadth of the reduced pinnule is 3 cm and 1.5 cm (Text Fig. I-a).

The attachment of the pinnule to the rachis is through midrib-region and latero-abaxial to the ridge of rachis.

The margin of pinnule is serrate and texture is coriaceous (Text Fig. I-b). All pinnules are potentially sporophylls.

Venation : The pinnules have a prominent central midrib and lateral veins arise nearly at right-angles to the midrib and only once dichotomise. These dichotomies unite by formation of commissural loops at the periphery, to form a single marginal vein, the intra-marginal vein (Text Fig. I-b, Plate No. III).

Fertile pinnule : The sporangia are born on the lower surface of pinnule towards margin on a flat receptacle. The receptacle is formed by the union of lateral veins in the form of intra-marginal vein. (Text Fig. I-C).

Sporangia are born in Sori and are protected by a flap like marginal indusium which is the continuation of upper epidermis. It is one cell thick, except at the base where it is 2 to 3 layers in thickness. Indusial cells are thin walled with irregular outline and elongated in a plane perpendicular to the leaf margin. There is no great regularity in the order of appearance of the sporangia on the elongated marginal receptacle. So the sorus is of a mixed characters. (Text Fig.VII-C, Plate No. IV-1).

Sporangium : A single sporangium has pear shaped sporangial body, stalked and dark brown in colour at maturity. The wall of the mature sporangium is single cell in thickness. The stalk consists of 2 rows of cells except at the attachment with sporangial body where it is 3 rows in thickness. The margin of the capsule is completely surrounded by a series of indurated cells, which forms the mechanically effective annulus. The average number of cells of the annulus per sporangium is 18. The annulus stops short on one side, where four transversely elongated, thin walled cells, define the stomium or the point where dehiscence will take place.

The rest of the cells forming the wall of the sporangium are parenchymatous, irregular in shape (Text Fig. VII-b, Plate No. IV - 3,4).

Spores : The spores are trilete, tetrahedral possess a projecting ridge like, thickened, pale brown equatorial collar. The spores are pale brown with more or less raised reticulum on the distal face having blunt spines. The trilete arms are nearly reaching the boundary. Spore size is 50.4 to 57.6 μ . Exine is 3.6 μ thick. Frill is 9 μ in thickness. Aperture crassimarginate. Length of aperture is 28.8 μ (Plate No. IV - 4). The average no. of spores per sporangium is 16 - 20.