

3) (ii) Cortex: - Below epidermis, a well defined cortex is present. In some cases it is differentiated into an outer sclerenchymatous cortex and inner parenchymatous cortex (e.g. S. kraussiana). On the other hand in case of S. selaginoides, the whole of the cortex is made up of parenchymatous cells which are either angular or rounded.

(iii) Stele: - The central portion of the stem has well defined stele which is of Protostelic type. Xylem remains surrounded by phloem. Pith is absent. The whole structure remains surrounded by single layer pericycle.

The stele remains suspended in the centre with the help of radially elongated, tubular, unicellular structures known as "trabeculae". These are formed by the radial elongation of endodermal cell. They are provided with Casparian stripes. In between the trabeculae "air spaces" are found.

Number of stele is variable in different species of Selaginella. For example -

- Monostelic - S. spinulosa
- Distelic - S. kraussiana
- Polystelic (12-16) - S. laevigata

Stele has usually monarch (e.g. S. kraussiana) or diarch (e.g. S. oregana) or multiarch (e.g. S. spinulosa)

Usually xylem is exarch but in case of S. selaginoides it is mesarch. Xylem is made up of tracheids.

Vessels are completely absent.

2) Internal structure of Root: -

T.S. of root is circular in outline. It shows the following structures: -

#### 4) Internal Structure of leaf :-

T.S. of leaf shows the following structure -

- (i) Epidermis :- It is the outermost layer which is one cell thick. The cells of the epidermis are provided with chloroplasts. The stomata may be present on outer and inner epidermis or it may be found only on lower epidermis near the midrib.
- (ii) Mesophyll :- Between upper and lower epidermis, a wide mesophyll made up of parenchymatous cells is seen. Intercellular spaces are present in mesophyll. The mesophyll cell has chloroplast (1, 2 or 8). Each chloroplast has several pyrenoid like bodies. In S. concinna, the mesophyll is differentiated into upper palisade and lower spongy parenchyma.
- (iii) Vascular Bundle :- In the centre of the leaf only one vascular bundle is present. It is concentric and amphicribal. It is made up of a few xylem tracheids surrounded by phloem. A single layered bundle sheath encircles the phloem on all sides.

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i) Epidermis: - It is the outermost covering which is one cell thick. The cells are large and bears unicellular hairs

ii) Cortex: - Just below the epidermis there is thick cortex. It is either made up of thin walled parenchymatous cells or may be differentiated into hypodermis (sclerenchymatous) and inner cortex (parenchymatous 3-5 cells thick). Inner cortex has air spaces.

iii) Endodermis: - Usually endodermis is not well defined but in few species as for example S. densa, clear endodermis is found.

iv) Pericycle: - Endodermis is followed by one to three layered parenchymatous pericycle.

v) Stele: - It is a <sup>typical</sup> Protoste, xylem is monarch and exarch. Xylem remains surrounded by phloem on all sides. only one protoxylem group is seen at the periphery.

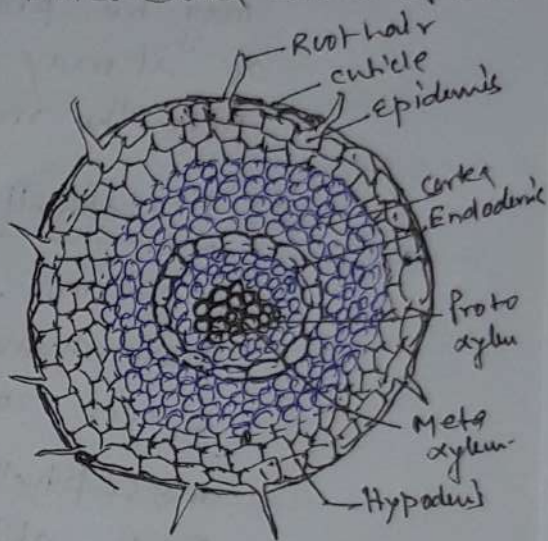


Fig - Selaginella T.S. root

3) Internal structure of Rhizophore: -

The internal structure of rhizophore is almost similar to the root. However, epidermis does not contain unicellular root hairs as found in root.

Name of the College: S.S. college, J'bad.

Date: 19.08.2020

Name of the Dept: Botany

Time: 11.00-12.00

Subject: Pteridophyta

Name of the Teacher: Drs. S. Sharma

Topic: Selaginella.

Class: B.sc (Bot) H - PI

Medium of Teaching: WhatsApp & College web site.

& Biotechnology Sub - PI

Selaginella: Internal Structure.

1. Internal Structure of stem:-

Transverse section (T.S) of the stem of Selaginella stem is somewhat circular in outline. It shows the following structure:

(i) Epidermis:- It is the outermost layer which is single cell thick. Stomata and hairs are absent from epidermis. Epidermis remains covered by a thick cuticle.

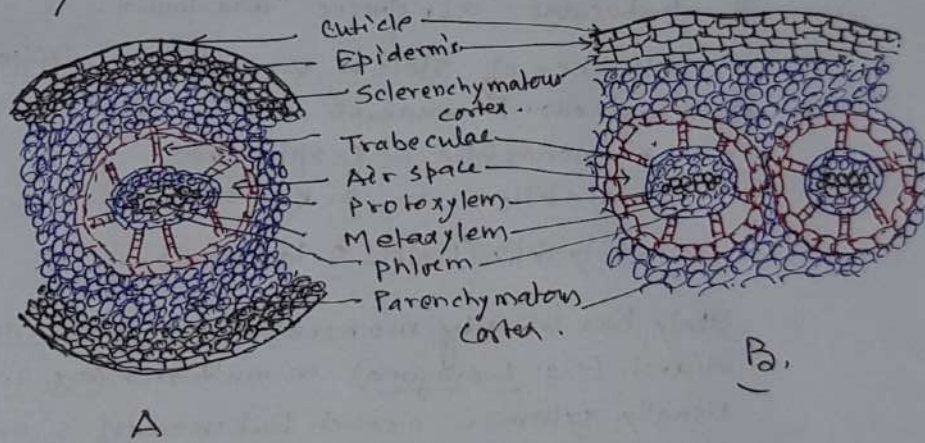


Fig. (A & B) Selaginella stem T.S.

A - T.S. monostelic stem

B - T.S. Distellic stem.