BOTANY( GENERAL )

SEMESTER-II

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# PTERIDOPHYTA:

# SELAGINELLA

**Systematic Position:**

Division: Pteridophyta

Class: Lycopsida

Order: Selaginellales

Family: Selaginellaceae

Genus: *Selaginella*

**External Morphology of the Sporophyte:**

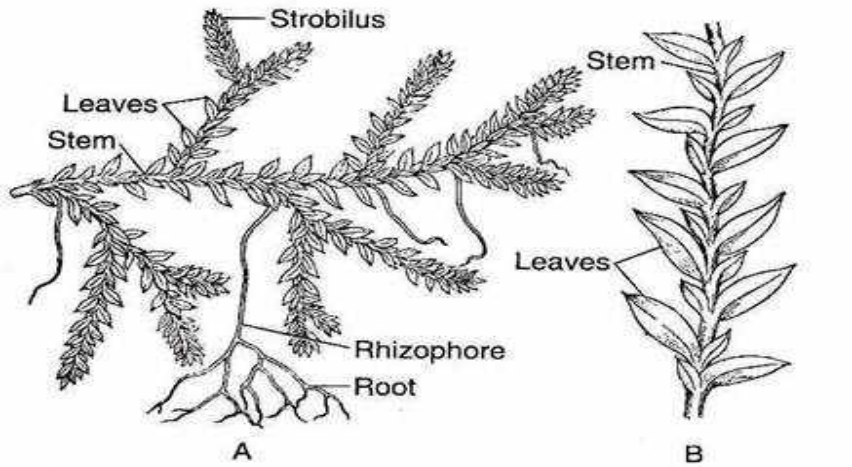



Fig. 7.46 : *Selaginella kraussiana* : A portion of sporophyte, B. An enlarged part of the stem showing leaf arrangement

The plant body is a sporophyte, which is creeping or climber. The plant body is herbaceous,dorsiventral prostrate,differentiated into rhizophore,roots,stems and leaves.

**Stem:** Stems are branched,prostrate,solid,herbaceous and green in colour.

**Leaves:** Leaves are microphyllous, heterophyllous, simple, sessile and ligulate. Leaves are two types, dorsal smaller leaves and ventral larger leaves. A single leaves shows ovate or lanceolate in shape, unbranched mid rib, margin serrated, apex is acute and green in colour. Leaves are spirally arranged on the stem.

**Rhizophore:** Rhizophore developed from the stem bearing both root and stem like mixed characters.

**Roots:** Roots are adventitious types and develops from the stem or tip of the rhizophore. Root hair is absent, but root cap is present.

**Internal structure of stem:**

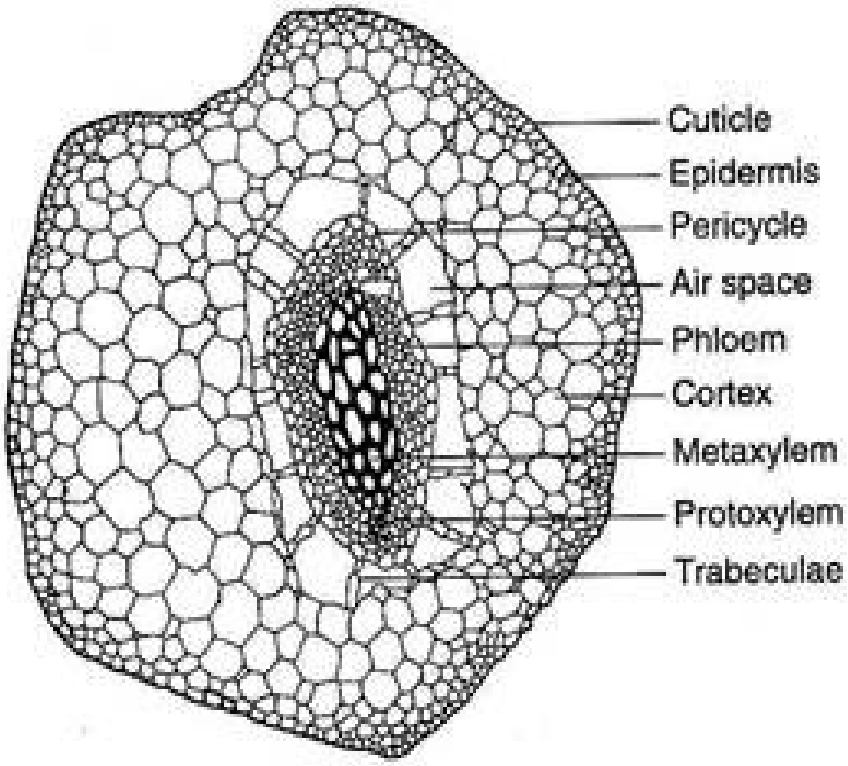



Fig. 7.47 : T.S. of *Selaginella* stem

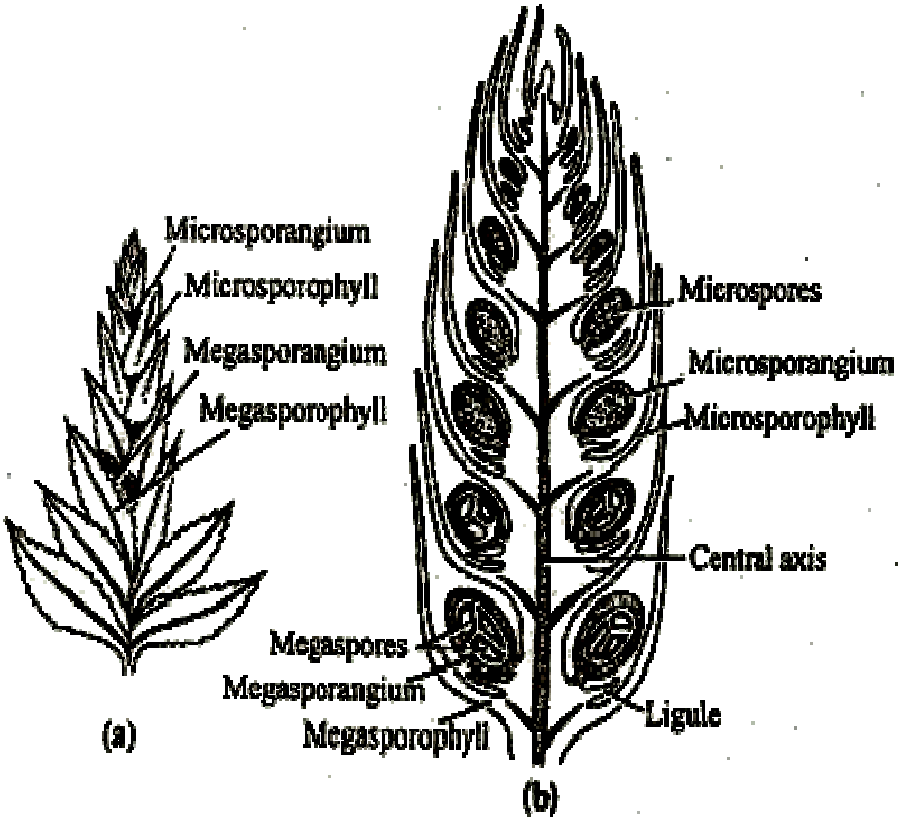
**Transverse section( T.S )of stem shows:**

**Epidermis:** Single layered, thin walled parenchymatous and cuticularised.

**Cortex:** Cortex is broad and heterogenous in nature. In which outer cortex is 3-4 layered, sclerenchymatous, middle cortex is thin walled and chlorenchymatous. Inner cortex is made up of large air cavities traversed by elongated endodermal cells which are called as trabeculae.

**Stele:** Stele is protostelic type( Haplostele).Here xylem is completely surrounded by phloem tissue. Protoxylem remains outerside and metaxylem towards the centre. Pith is absent.

**The Strobilus:**




A strobilus showing compactly arranged sporophylls (b) L.S. through strobilus

The sporangia bearing region of the sporophyte is the strobilus. The strobilus is always terminal in position, flat, leafy and yellowish brown in colour. *Selaginella* is heterosporous, so each strobilus consists of two types of sporophylls which are microsporophylls and megasporophylls are spirally arranged along the axis. Each microsporophyll bear microsporangium and megasporophyll bears megasporangium at its base. Each microsporangium is ovoid to spherical in shape, shortly stalked, bilayered sporangial wall enclosing many mcrospores. Each mature megasporangium is globose in shape, comparatively larger than the micro sporangium with short stalk, two layered wall containing four haploid functional megaspore.

**Gameto phytic generation:**

Spore is the first cell of the gametophytic generation. Each microspore develops into a male gametophyte, which are produce endogenously within the micro sporangia. Here micro sporangia acts as a male gametophyte , so numerous biflagellate antherozoids are produced within micro sporangia. Each megaspore is germinate to produce female gametophyte, which has upper lobed region containing archegonia and lower region contains nutritive tissue. After maturation , fertilization takes place, which produce diploid zygote, which soon divides to produce multi cellular embryo and embryo ultimately develops into new sporophytic plant body.

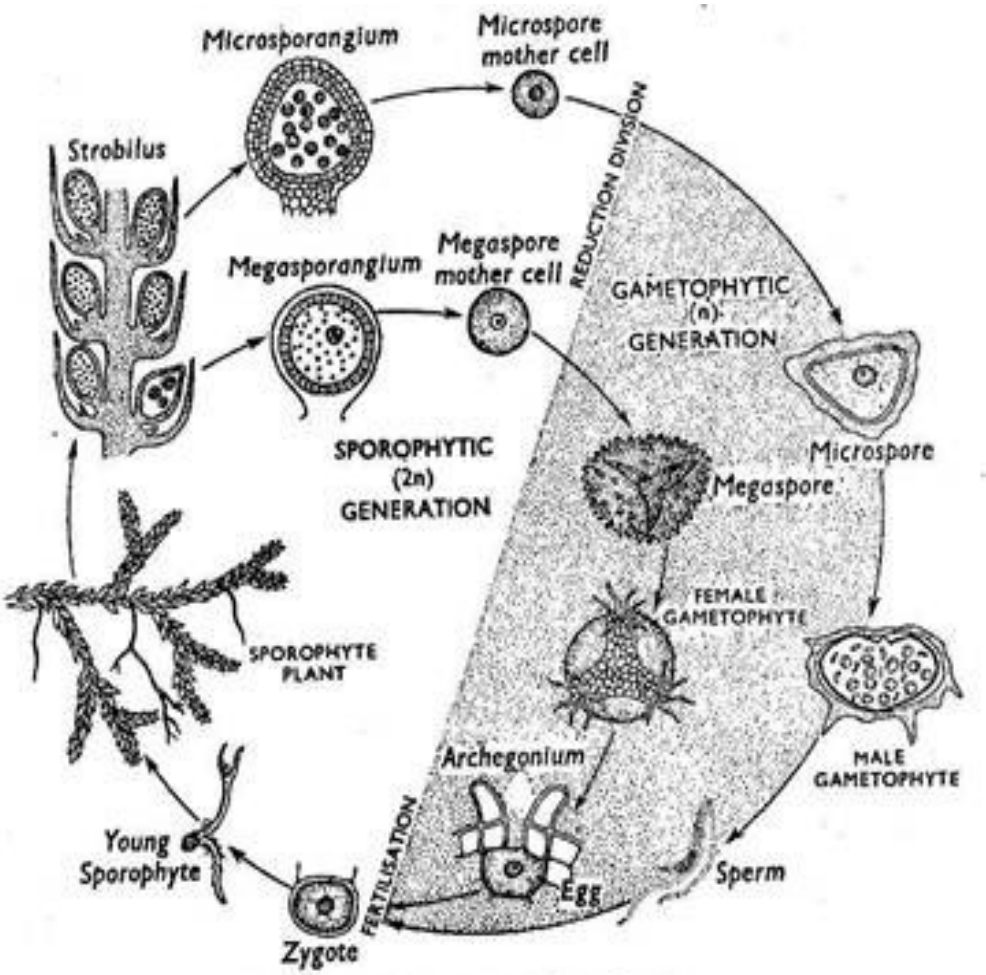



Fig. 7.58 : Life cycle of *Selaginella*