Psilophyta

Phylum Psilophyta – The whisk ferns

- Resemble green whisk brooms.
- Habitat- epiphytic or on rich soils
- Sporophyte has dichotomously forking stems
- No true leaves or roots
- Rhizoids function as roots
- Grow up to 30 cm

Unique features:

- **Stems and sporophytes have neither true leaves or roots**
- **Stems and rhizomes that fork evenly.**

General Characters

The Class is represented by two living genera – *Psilotum* and *Tmeseptris* .

The general characters are as follows:

1. The plant body is a rootless sporophyte that differentiates into a subterranean rhizome and an aerial erect shoot.
2. Branching is dichotomous in both subterranean rhizome and aerial shoot.
3. The large rhizoids borne on the rhizome absorb water and nutrients from the soil.
4. On the aerial shoots, spirally arranged scale-like (e.g., *Psilotum*) or leaf-like appendages (e.g., *Tmesipteris*) are borne.

General Characters

5. Stele is protostelic or siphonostelic with sclerenchymatous pith.

6. Secondary growth is absent.

7. Bi- or trilocular sporangia are borne in the axils of leaf-like appendages.

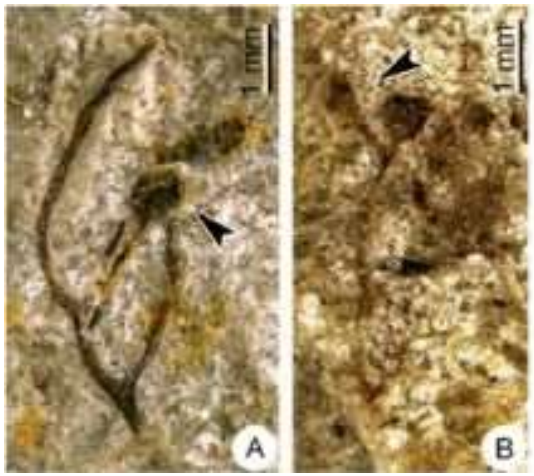
8. Mode of sporangial development is of eusporangiate type.

9. Spores are of equal sizes and shapes i.e., homosporous.

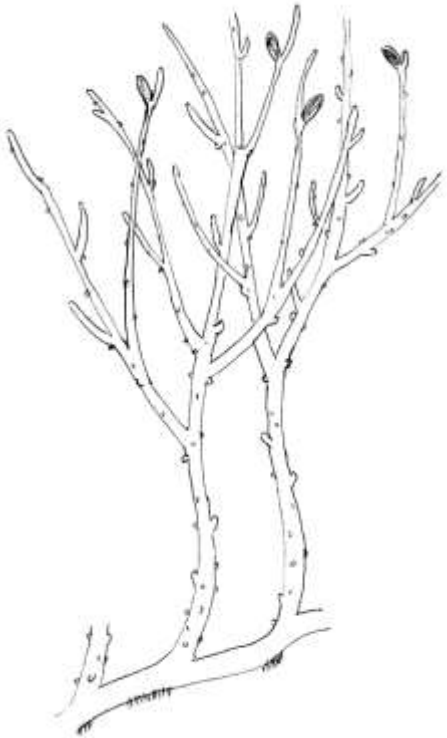
10. The gametophytes are non-green, cylindrical, branched and subterranean. They grow as saprophytes with an associated endophytic fungus.

11. Antherozoids are spirally coiled and multi- flagellated.

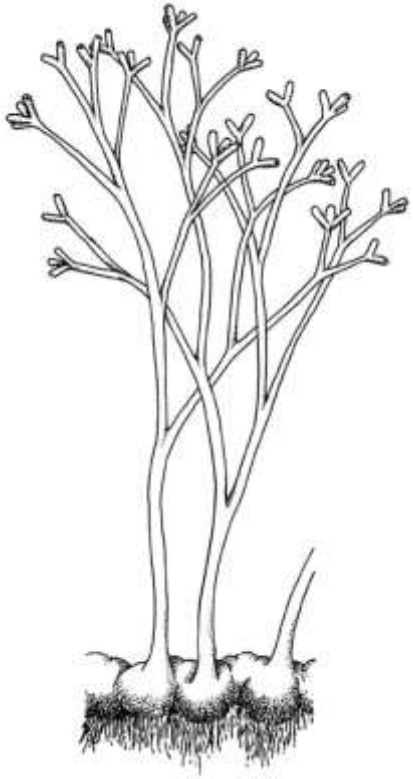
Psilophyta (Fossils)



Rhynia sp

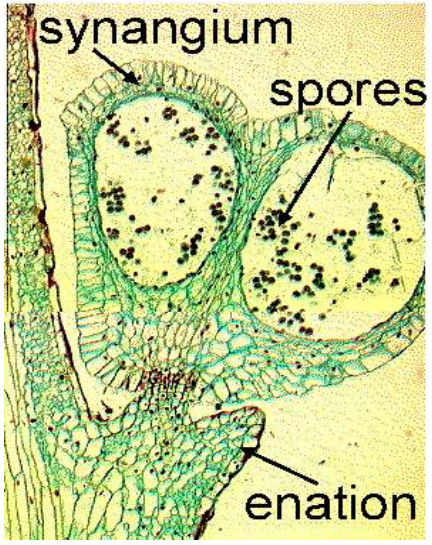


Rhynia sp



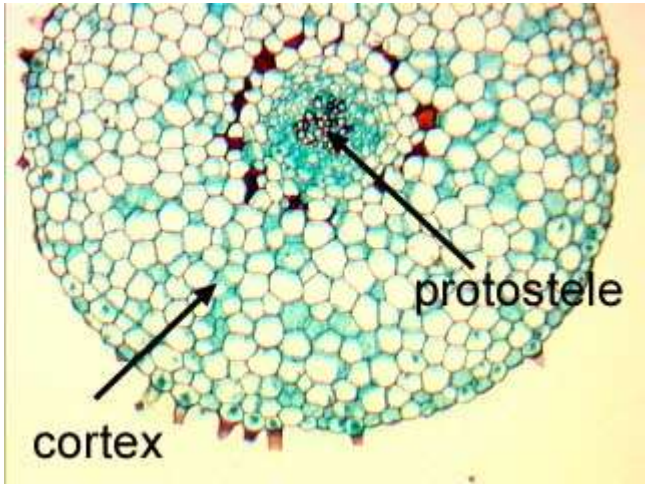
Horneophyton sp

Psilophyta–*Psilotum*

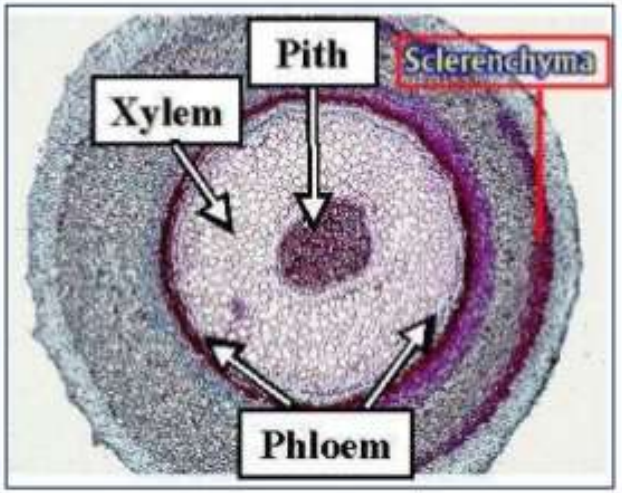


Psilophyta- *Tmesipteris*

Psilophyta- Anatomy of stem



Protostele



Siphonostele

Psilotum

- The sporophyte of *Psilotum* looks like a survivor from the Devonian age.
- it has no leaves nor roots, a protoxylem, a dichotomously branching green stem with small scales.
- The stem bears bright yellow synangia (formed from three fused sporangia) on short lateral branches.
- It is homosporous and the spores develop into bisexual gametophytes that resemble pieces of sporophyte rhizome.
- The data from current RNA sequencing and other chemical analyses suggests that *Psilotum* appears to be a *descendent* of the ferns by loss and simplification of structures.

Life cycle of *Psilotum*