

8. Provide a brief account of Psilotales. Point out their affinities.

INTRODUCTION → Psilotales are primitive vascular cryptogams. So it in primitive features in their morphology, anatomy, spore producing organs and in their gametophytic details. The plants are sporophytes but without any differentiation there are no roots and both rhizome and aerial branches are dichotomously branched. They are homosporous. Gametophytes are monoecious and sex organs are simplest amongst living Pteridophytes.

CLASSIFICATION → The order has been divided into two families, each contain a single genus.

Family 1 - Psilotaceae

Genus - Psilotum

Family-2 - Tmesipteritaceae

Genus - Tmesipteris.

STRUCTURE OF PLANT BODY → Plants of the group are sporophytes but they are axis like. Psilotum nudum is a cosmopolitan species occurring in different parts of the world including India. But Psilotum floccidium and species of Tmesipteris are endemic and epiphytic. They have been reported from Newzealand, Java, Malaya,

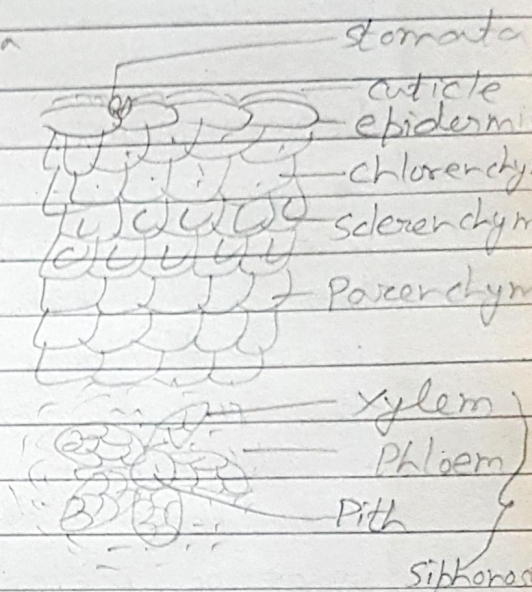
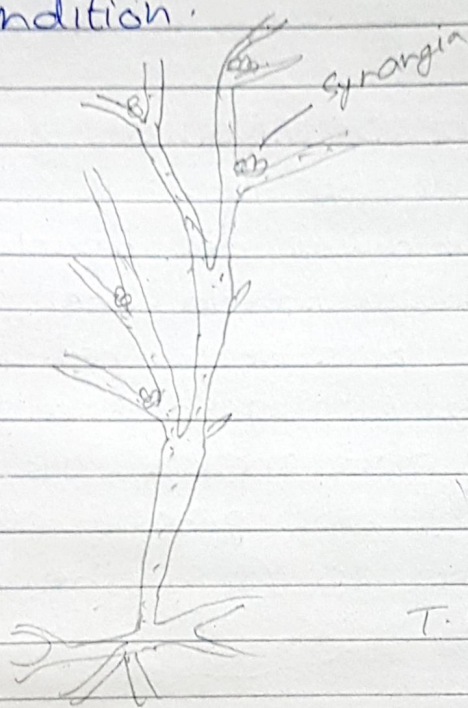
Sumatra and Pacific Islands. They show the following important features in their morphology.

1. The axis like plant body is divisible into rhizome and aerial branches.
2. Both rhizome and aerial branches are dichotomously branched.
3. Roots are absent and instead rhizome bears numerous rhizoids for fixation and absorption.
4. Aerial branches of *Psilotum* are naked. They bear scaly leaves in spiral order.
5. Aerial branches of species of *Tmesipteris* are pendent. They bear microphyllous leaves in spiral order.

ANATOMY OF THE STEM → Internally the stem shows a single layer, thin walled epidermis covered by a thin layer of cuticle. It also bears functional stomata for transpiration and gaseous exchange. The broad cortex remains differentiated into outer, middle and inner zones. They have been found composed of chlorenchyma, sclerenchyma and parenchyma respectively. They perform the function of carbon assimilation, mechanical support and food storage.

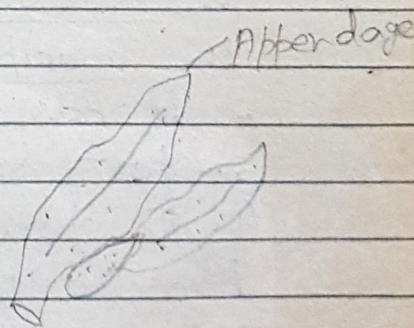
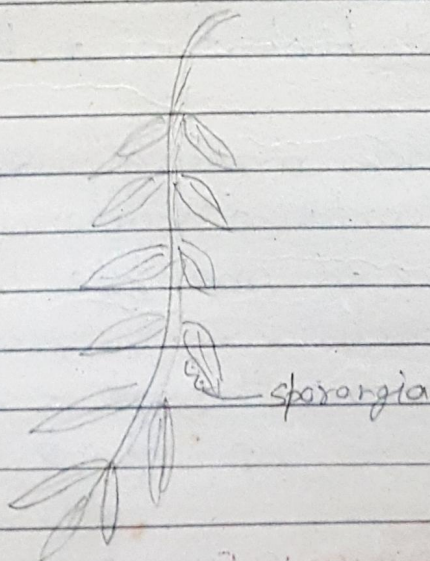
Stelar structure varies in different parts of plant body. It is a protostele in juvenile stage. The base of mature

branches shows a siphonostele with starlike xylem. Phloem occurs in between xylem rays. The upper part of aerial branches have also siphonostelic condition but with reduced number of xylem rays. However, the tip of aerial branches show a plectostelic condition.



T.S of mature stem of *Psilotum*.

P. nudum



Sporangial structure with appendage

Imesipteris tannensis