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Psilotales (The Whisk Ferns)

The Psilotales contains two living genera and records of many fossils dating back about 350-400 million years. Some think they are the most primitive of vascular plants; their morphology is similar to the oldest fossil vascular plants. However, DNA evidence has shown that Psilotophytes are evolutionarily advanced but degenerate fern relatives.

The two living Genera are:

Psilotum

Tmesipteris

Both genera are found in tropical to subtropical habitats. *Psilotum* is reasonably abundant in moist areas of Hawaii and is also found in some of the southern US states. We shall discuss *Psilotum*.



Psilotum



Tmesipteris

Structure

As is true of all vascular plants the sporophyte generation of the Psilophytes is predominant. Vascular tissue however, is found just in stems. *Psilotum* lacks true vascular roots or true vascular leaves. *Psilotum* sporophytes have dichotomously branched, vascular aerial stems, which arise from underground vascular rhizomes.

Rhizoids, found on the rhizomes, associate with mycorrhizae for absorption of water and nutrients.

Enations, small scalelike structures spiral up the stem, and are often thought of as miniature “leaves”.

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Psilotum is homosporous and produces three-lobed sporangia in enation axils.

Psilotum gametophytes are non-photosynthetic and subterranean. They are cylindrically shaped dichotomously branched saprobes that have mycorrhizae for absorption of nutrients and water. The gametophytes are bisexual; both archegonia and antheridia are found along the surface of one gametophyte. The sperm are multiflagellated and require water for transport to archegonia.

