

Topic: Lycopodium; Morphology
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Systematic position

Division- Lycophyta

Class- Eligulopsida

Order- Lycopodiales

Family- Lycopodiaceae

Genus- *Lycopodium*

Distribution and habit

The species of *Lycopodium* are world-wide in distribution. They are mainly found in tropical and sub-tropical forests. They are very commonly found on heaths and on humus soils in moist shady places. In India they are found in the hills of Eastern Himalayas.

The plants are commonly known as 'ground pines', 'club mosses' and 'trailing evergreens' many species occur in the tropics as hanging epiphytes (e.g., *Lycopodium phlegmaria* and *L. squarrosum*). Chowdhury (1937) has reported eight species from our country. These species are *Lycopodium clavatum*;

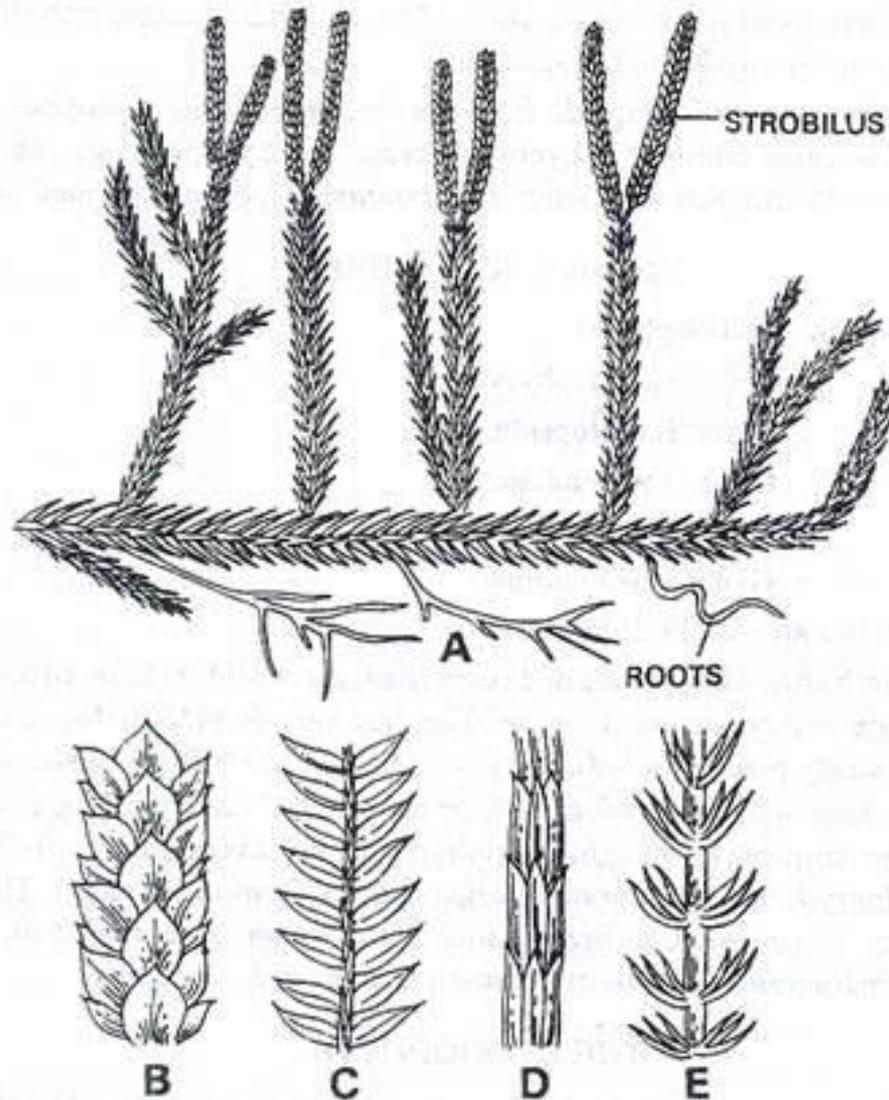


Fig. *Lycopodium*. A, part of a plant of *L. clavatum* showing strobili; B-E, leaf form and arrangement in *Lycopodium*; B, *L. refescens*; C, *L. volubile*; D, *L. complanatum*; E, *L. cernuum*.

L. cernuum, *L. heamiltonii*; *L. setaceum*; *L. phlegmaria*; *L. wightianum*; *L. serratum* and *L. phyllanthum*. The most common species is *L. clavatum*.

The Sporophyte

All species possess small, herbaceous or shrubby sporophytes. The stem in almost all the species is delicate and weak. Some species are epiphytic and with erect or pendant sporophytes while other species are terrestrial and have a trailing habit. The stem and its branches are densely covered with small leaves. *Lycopodium phlegmaria* is an epiphytic species.

According to Pritzel (1900) this genus is divided into two sub-genera which differ from each other in general organization of the sporophyte. These subgenera are-Urostachya and Rhopalostachya.

Stems

Species referred to the sub-genus Urostachya possess branched or unbranched stems that are erect or pendant but never creeping. This subgenus includes the

species, e.g., *L. selago*, *L. lucidulum*, *L. phlegmaria* and others. If the stem is branched, the branching is always dichotomous. Usually the successive dichotomies are found at right angles to one another. The species belonging to this subgenus do not bear the adventitious roots along the stem.

The subgenus *Rhopalostachya* includes the species, e.g., *L. clavatum*, *L. inundulatum*, *L. complanatum*, *L. cernuum* and others. The species referred to this subgenus possess prostrate stems bearing upright branches. The branching of the stem in the first-formed portion may be dichotomous, but in later-developed portion it is always monopodial.

Leaves

The leaves are small, simple, sessile, numerous and cover the axis closely. Typically the leaves are 2 to 10 mm long. Usually the leaves are arranged in closed spirals (e.g., in *L. clavatum* and *L. annotinum*) while in other cases they are arranged in whorls (e.g., in *L. verticillatum* and *L. cernuum*).

In some species the leaves are found to be arranged in opposite pairs (e.g., *L. alpimum*); in others they are irregularly arranged. Usually the leaves are lanceolate in outline possessing the broad bases. Usually the first-formed leaves on the stem do not bear the mid-rib, the later formed leaves usually possess a single unbranched vein that starts from the base but does not reach the apex.

The leaves are all alike in size and shape, but in few species, such as *L. complanatum*, *L. volubile* and *L. chamaecyparissus* the leaves are dimorphic like that of *Selaginella* and found to be arranged in four vertical rows on the stem two being smaller and two larger in size.

Apical growth

The apical growth of the shoot takes place by means of an apical meristem which consists of a group of apical cells.

Roots

The first root is short and at least in some species does not live long. The older plant bears the adventitious roots that arise singly or in groups acropetally along

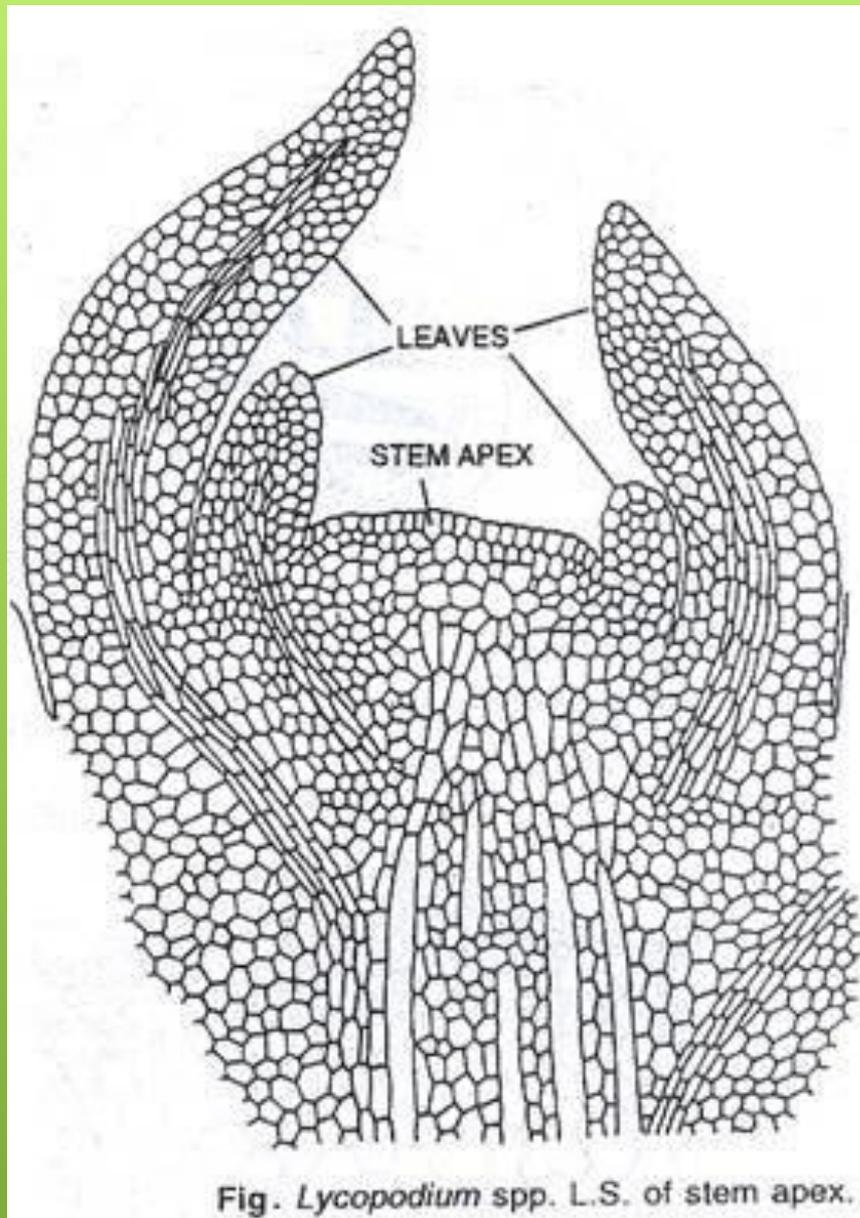


Fig. *Lycopodium* spp. L.S. of stem apex.

the lower side of the stem. The species of subgenus *Urostachya* do not possess adventitious roots along the stem. The species of the subgenus *Rhopalostachya* with a creeping stem generally have their adventitious roots borne along the entire length of the prostrate portion.

In some species, e.g., *L. selago*, *L. phlegmaria* and others the roots that arise on the outside of the stele do not penetrate the cortical region of the stem at once. These roots turn downward and penetrate the soft middle cortex making canals through it, and ultimately they emerge only at the stem. Such roots are known as 'cortical roots' or 'inner roots'.

In some species, (e.g., *L. obscurum* and *L. lucidulum*) the branching of the roots is strikingly dichotomous. Here each successive forking is found at right angles to the preceding one. In many species the dichotomy is obscure. The endogenous lateral roots do not arise from the roots (as in seed plants). In terrestrial form the root hairs are found abundantly which persist over a long period