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Popular Article

# Anatomical And Phytochemical Evaluation of *Lycopodium Cernuum L.* [Lycopodiaceae] Aerial Stem

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***Abstract***

*Lycopodium cernuum* Linn. syn. Huperzia (Family: Lycopodiaceae), commonly known as club moss, ground pine, devil's claw, devil ash, is a pteridophyte abundantly found in tropical forests of Yercaud ,Salem district.,Tamil Nadu .The plant was collected and the aerial stem was studied for the anatomical and phytochemical features to check the authencity of the plant. The anatomical features showed the presence of mixed protostele and total ash content being high also there was presence of phenol,tannin and steroids.

**Keywords:** Devil Ash, Fern, Lycopodium, Plant Anatomy, Stem, Total Ash, Yercaud.

## Introduction

Lycopodium Linn. syn. Huperzia (Family: Lycopodiaceae), pteridophyte abundantly found in tropical forests in Tamil Nadu. Many lycopods are used by tribals for memory-enhancing effect, stomach pain, to treat burnt skin, leaf decoction against muscle pain and rheumatism, as a tonic or an analgesic to relieve rheumatic pain in joints also a future-promising drug for treatment of Alzheimer's, for wound-healing effect against nappies occurring in babies and, therefore, also called "belly powder" Spores of the plant possess a protective effect as dusting powder for tender skin [1-5].

## MATERIALS AND METHOD

i) **Collection of experimental plant:** The whole plant was collected from Yercaud hills of Tamil Nadu, India identified by botanist of Guru Nanak College Chennai. (Plate 1) a voucher

specimen was deposited in the institute's herbarium 99 PBPBT 2022. Macroscopic characters were studied.

**ii) Anatomical Characters of experimental plant**

Microscopical characters were studied (Evans, Trease and Evans, 1997). The aerial stem was studied under the compound microscope. For anatomical characters. Microtome sections were cut and stained with safranin photographed with Nikon F70X camera.

**iii) Phytochemical properties of Lycopodium Stem**

Ten grams of the stem powder was extracted with 100 ml of double distilled water, chloroform, ethyl acetate, ethanol and kept for 48 hours. The samples were filtered and the filtrate was dried in a lyophilizer. Different extracts were screened for the presence of phenols, flavonoids, tannin, saponin, alkaloids and steroid by using standard protocols [6-7].

**iv) Total Ash of Lycopodium Stem**

Incinerate about 2 g of accurately weighed powdered stem in a silica dish at a temperature not exceeding 450º until free from carbon, cool and weigh. If a carbon free ash cannot be obtained in this way, exhaust the charred mass with hot water, collect the residue on an ash less filter paper, incinerate the residue and filter paper, add the filtrate, evaporate to dryness, and ignite at a temperature not exceeding 450º. Calculate the percentage of ash with reference to the powdered stem [8].

**v) Determination of Water-Soluble Ash**

Boil the ash for 5 minutes with 25 ml of water; collect insoluble matter in a Gooch crucible or on an ash less filter paper, wash with hot water, and ignite for 15 minutes at a temperature not exceeding 450º. Subtract the weight of the insoluble matter from the weight of the ash; the difference in weight represents the water-soluble ash. Calculate the percentage of water-soluble ash with reference to the air-dried plant material.

**Results**

**i) Macroscopic and Microscopic Characters of Stem**

Plants small, herbaceous have dichotomously branched stems and small microphyllous needle like leaves, and do not possess a ligule, arranged spirally around branched stem. Terminal end with a strobilus or cone showing dichotomy.

Transverse section of Lycopodium stem shows a superficial epidermis, a broad cortex and a central massive vascular cylinder or stele (Plate 2). Epidermis is one cell in thickness, well protected



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by a thick, cuticle and stomata are present in epidermis. Cortex is quite broad two concentric zones; inner and outer zones are usually composed of elongated sclerenchymatous cells, with no inter cellular spaces and inner zone has large thin-walled parenchymatous cell. Endodermal cells show characteristic thickening on radial wall, within endodermis is pericycle composed of one layer of thin-walled cells. Vascular system has xylem and phloem in alternative plates or bands. Radial arrangement.Stele of this type is known as mixed protostele (Plate 2). Growth of both xylem and phloem is centripetal. -stele lacks a cambium and hence no secondary tissue is formed.

Mixed protostele being characteristic feature of ***Lycopodium cernuum*** hence proving the authencity of the plant material.

**ii) Phytochemical screening**

Revealed the presence of sugar, starch,.tannin alkaloid, flavanoids and steroids (Table 1). Presence of these phytochemical constituents mightbe responsible for the therapeuticpropertiesexhibited bythisplant.

iii) **Ash content and water soluble ash** of the dried plant material gave following values: moisture 85; total ash, 7.85 water soluble extractive, 34.30

**Table1: Phytochemical properties of the stem of *Lycopodium clavatum***

| S.NO | COMPOUND | AQUEOUS EXTRACT | CHLOROFOR MEXTRACT | ETHYL ACETATE EXTRACT | ETHANOL EXTRACT |
|---|---|---|---|---|---|
| 1 | SUGAR | + | - | + | + |
| 2 | STARCH | + | + | - | + |
| 3 | TANNIN | - | + | + | - |
| 4 | ALKALOIDS | - | + | + | - |
| 5 | FLAVANOIDS | - | + | + | + |
| 6 | STEROIDS | - | + | + | - |

*Shade dried powdered material .(+)presence and (-)absence



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**Plate1: Habit Of Experimental Plant**

**Discussion**

The above parameters help in identifying the species and to establish the authenticity of this plant and can possibly help to differentiate the drug from its other adulterants Futher work on ant diabetic and anticancer activity can be carried out and studied. [9-12]

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