

# Subject – Botany

Chap- 3 Utilization and Economic Importance of  
Pteridophytes

Paper I Plant Life and Utilization II

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By

Dr Shilpa Jagtap

# Learning objects

- Introduction
- Utilization and Economic Importance of Pteridophytes as food
- Utilization and Economic Importance of Pteridophytes in medicinal used/Ethanomedicine
- Utilization and Economic Importance of Pteridophytes as Ornamental Plant
- Utilization and Economic Importance of Pteridophytes as Bio fertilizer
- Pteridophytes used as Indicator Plants
- Pteridophytes used as Various purposes

## Introduction

- The pteridophytes which include the ferns and a group of vascular plant of ancient or primitive land plant with worldwide distribution.
- The economic value of pteridophytes have been known to men for more than 2000 years and have been found as an important source of food and medicine. Pteridophytes are usually useful but few are harmful.
- The economic importance of pteridophytes is not well-documented, because due attention has not been given towards their use in human welfare. However, there are many reports on their uses, specially as food plants, medicinal plants and horticultural plants.

## Pteridophytes Used as Food:

•The young leaf tips of ferns, the circinate ptyxis or the chroziers are used as vegetable. The young fronds of *Ampelopteris prolifera* are sold in the market as ‘dheki shaak’ in India and Bangladesh. The croziers of *Matteuccia struthiopters* as canned or frozen are served as spring vegetable in USA and Canada. Leaves of *Marsilea*, commonly called ‘shushni’, are used as vegetable.

•The rhizome of many ferns such as *Pteris*, rich in starch, is used as food.

• Pteridophytes Used as Fodder:

•The corm (modified stem) of *Isoetes* is used as food by pigs, ducks and other animals.

•Dry fronds of many ferns form the livestock for cattles. The quadrifid lamina of *Marsilea* resembles a clover (*Trifolium*) has been used as fodder for animals as a substitute for clover.

## Pteridophytes Used as Medicine:

•The spores of *Lycopodium* have been widely used in pharmacy as protective dusting powder for tender skin and also as water-repellants. The foliages of *Lycopodium* are used as tincture, powder, ointment and cream as a stomachic and diuretic. The foliage decoction is used in homeopathy to treat diarrhoea, bladder irritability, eczema, rheumatism, constipation and inflammation of liver.

•*Equisetum* is rich in silicic acid and silicates. Potassium, aluminium and manganese, along with fifteen types of flavonoid compounds, have been reported from *Equisetum*. The flavonoids and saponins are assumed to cause the diuretic effect. The silicon is believed to exert connective tissue-strengthening and anti-arthritic action.

•Several ferns have been used as herbal medicine. An oil (5% Filmaron and 5-8% Filicic acid) extracted from the rhizome of *Aspidium* is used as a vermifuge, especially against tapeworm. The decoction of *Asplenium* is used for cough and a good hair wash. The expectorant of *Polypodiumis* used as a mild laxative, while the tonic is used for dyspepsia, loss of appetite and hepatic problem.

•The root decoction of *Osmunda regalis* is used for treatment of jaundice. The ointment made from its root is used for application to wound. The extraction of *Osmanda vulgaris*, commonly known as ‘Green oil charity’, is used as remedy for wounds. The chemically active principal ‘Marsiline’ isolated from *Marsilea* is found to be very effective against sedative and anticonvulsant principal.

•The rhizome and frond bases of *Dryopteris* have been used to determine the origin and pathways of dispersed pathogenic insects like corn ear- worm. The preparation of *Ophioglossum vulgatum* as ‘Green oil charity’ is also used as remedy for wounds

## **Pteridophytes Used as Biofertiliser:**

•*Azolla* is a free-floating water fern which can multiply very quickly through vegetative propagation. There are hundreds of moss-like leaves harbouring live colonies of dinitrogen fixer Cyanobacterium - *Anabaena azollae*.

•The relationship between the alga and *Azolla* is symbiotic where the alga provides nitrogen to the plant. Thus, *Azolla* in full bloom in the waterlogged rice fields may serve as a green manure.

•Rice farmers of our country are using *Azolla* as biofertiliser for the better production of their crops.

## Pteridophytes Used as Indicator Plants:

•Like angiosperms, pteridophytes are being used as indicator plants.

•*Equisetum* accumulates minerals, especially gold, in their stem. The rate of accumulation even reaches up to 4.5 ounce per ton. *Equisetum* may be referred to as gold indicator plants which help in searching a region for gold ore deposits. Similarly, *Asplenium adulerinum* is an indicator of nickel and *Actinopteris australis* is a cobalt indicator plant. Thus, these plants are found to be valuable in prospecting for new ore deposits.



## Pteridophytes Used for Various Purposes:

- There are various applications of pteridophytes:
- The stem of *Equisetum* was used for polishing wood in ancient times and to clean utensils.
- The roots and stems of *Osmunda* are used to make beds for growing orchids. Water boiled with *Lycopodium clavatum* is used for dyeing the woollen clothes which becomes blue when dipped in a bath of Brazil wood.
- The powder of *Lycopodium* is highly inflammable and is used in pyrotechny and for artificial lighting. Thus, *Lycopodium* powder finds its wide use in demonstration of artificial lighting on the stage, because it disperses easily in the air and only a small quantity is needed to produce an explosion.
- Some of the pteridophyte members are considered to be the obnoxious weeds. *Pteridium aquilinum* is a carcinogenic plant which can rapidly invade the open forest lands, thus eliminating the other plants of the forest floor. The free-floating water fern, *Salvinia*, quickly propagates vegetatively, and thus occupies the entire water surface of lakes, ponds and irrigation reservoirs preventing free flow of water.

# Reference

•SEM II, GE, CC 2, Chapter 1 (Pteridophytes) Compiled by Dr. Jayanta Sikdar, Assistant Professor, Surendranath College, 24/2 M.G. Road, Kolkata, West Bengal 7000091, Pteridophytes: General Characters, Economic Importance