PTERIDOLOGY

Economic importance of Pteridophytes

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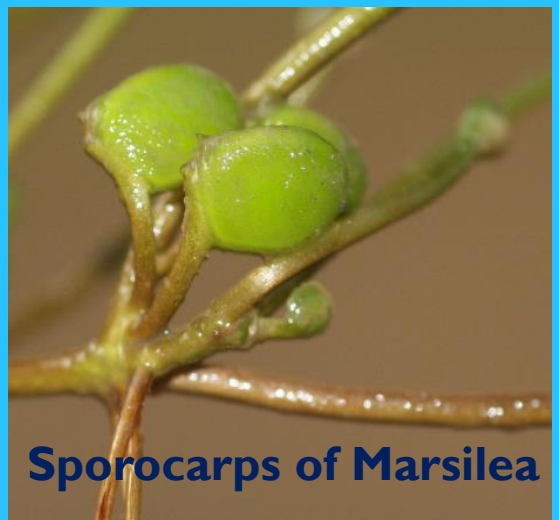
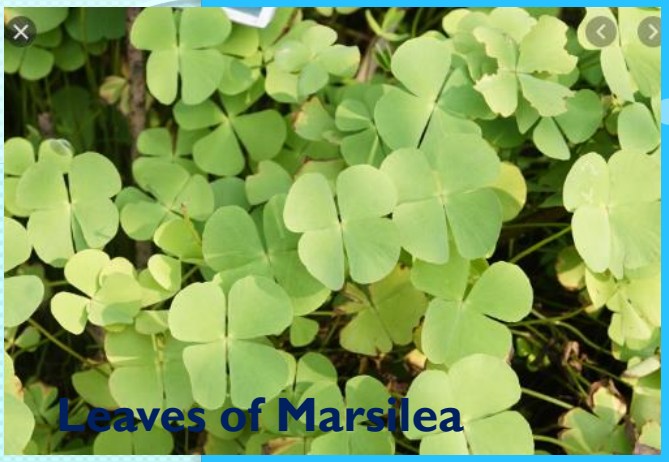
- **Food:**
- Like other plants, pteridophytes constitute a good source of food to animals.
- Sporocarps of Marsilea, a water fern, yield starch that is cooked and eaten by certain tribal.
- The young leaf tips of ferns, the circinate ptyxis or the chroziers are used as vegetable. The young fronds of Ampelopteris prolifera are sold in the market as ‘dheki shaak’ in India and Bangladesh.


Sporocarps of Marsilea


Ampelopteris prolifera


Leaves of Marsilea


Matteuccia struthiopters

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

Pteridophytes Used as Fodder:

- Dry fronds of many ferns form the livestock for catties.
- The quadrifid lamina of Marsilea has been used as fodder for animals

- **Soil Binding:**
- By their growth pteridophytes bind the soil even along hill slopes.
- The soil is protected from erosion.

- **Scouring:**
- Equisetum stems have been used in scouring (cleaning of utensils) and polishing of metals.
- Equisetum species are, therefore, also called scouring rushes.

- **Nitrogen Fixation:**
- Azolla (a water fern) has a symbiotic association with nitrogen fixing cyanobacterium (Anabaena azollae).
- It is inoculated to paddy fields to function as biofertilizer.

- **iii. 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 antiarthritic 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 Polypodium is 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 wound

- 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 Horticultural Plants:

- Many species of pteridophytes are cultivated for their aesthetic value. Many variants and cultivars of Psilotum have been brought in cultivation in nurseries and greenhouses in the nickname of ‘whisk fern’.
- Some epiphytic species of Lycopodium (e.g., L. phlegmaria, L. lucidulum) are aesthetically more valued and can be grown on hanging baskets.

- Several species of Selaginella are used as a ground cover in an undisturbed area because of their decent foliage and colour. Salaginella willdenovii, S. uncinata, etc., are grown in gardens for their decent blue colour. 5. lepidophylla, S. bryopteris, etc., are sold as dried under the name ‘resurrection plants’ which rejuvenate on contact with water.
- Several ferns such as Angiopteris, Asplenium, Marattia, Microsorium, Nephrolepis, Phymatodes, etc., have aesthetic values for their beautiful habit, graceful shape of the leaves, and beautiful soral arrangement. Thus, these characteristics make them horticulturally important plants.

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 water-logged 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 adulterinum 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 occupy the entire water surface of lakes, ponds and irrigation reservoirs preventing free flow of water.

Thank You