

## **Ethnobotanical Studies of Some Important Ferns**

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### **Abstract**

The ethnomedicinal value of ferns, used by the tribals of India such as Baiga, Gond, Korawa, Kanwar, Tanwar, Manjhwar, Oraon, Manjhi, Dhanwar, Binjihwar, Agariya, Pando and other people of the world is focused on in the present paper. The tribals frequently use ferns as medicines for the cure of various ailments. The information gathered from them (and also collected from other sources) is herein described.

**Key Words:** Ethnomedicinal uses, ferns.

### **Introduction**

Ethnobotanical studies have attracted a number of field workers in recent years and they have supplied a lot of information about different uses of plants prevalent among the various tribes and natives of India. All over the world, there has been an increasing interest in the scientific study of man-plant interaction in the natural environment which is clearly visible among various indigenous people, commonly designated as aboriginals, natives, autochthonous, fourth world, first people, adivasis (original settlers), vanyajati (forest castemen), adimjati (primitive castes), janjati (folk communities) and tribals. China and India together have more than 150 million indigenous and tribal people. At least 5000 indigenous groups can be distinguished by linguistic and cultural differences and by geographical separation. Today, ethnobotany has become an important and crucial area of research and development in resource management, conservation of biodiversity at genetic, species and ecosystem levels, and socio-economic development of the region. The ancient medical knowledge of various tribes and folklore systems of medicine, sometimes referred to as ethnotherapeutics, has therefore provided a powerful and more effective strategy for the discovery of clinically useful compounds.

### **Observations**

During the collection of Pteridophytes from almost all over the country, the author came to know about the medicinal value of certain ferns from the local inhabitants belonging to the tribes of

India such as Baiga, Gond, Korawa, Kanwar, Tanwar, Manjhwar, Oraon, Manjhi, Dhanwar, Binjihwar, Agariya, Pando and others . The tribals treat various diseases and disorders by using the following ferns available around their ambient vegetation. They prepare paste, decoction, aqueous extract, powder and juice from a single plant or in combination with different parts of other plants. The following species of ferns are commonly used for medicine and food by the tribals:

***Adiantum Capillus veneris* (Linn.) (Fam-Pteridaceae)**

**Common name** –: Maiden hair fern, Avenca, Herba capillorum veneris, Ladies' hair, Venus hair fern, Indian name: Hans Raj.

Rhizome short to suberect, covered with brown scales and hairs. Fronds bipinnate, petiole and rachae shining and brown in colour, with 5-6 secondary pinnules, rhomboidal in shape with 3-8 deeply cut lobe. Sori marginal with soral flaps infolded, semicircular to transversely elongated, 2-3 mm broad.

**Distribution:** Europe ,Africa, America, Australia, North India

**Uses:** The maidenhair fern has a long history of medicinal use and was the main ingredient of a popular cough syrup called 'Capillaire', which remained in use until the nineteenth century. The fresh or dried leafy fronds are antidandruff, antitussive, astringent, demulcent, depurative, emetic, weakly emmenagogue, emollient, weakly expectorant, febrifuge, galactagogue, laxative, pectoral, refrigerant, stimulant, sudorific and tonic. A tea or syrup is used in the treatment of coughs, throat afflictions and bronchitis. It is also used as a detoxicant in alcoholism and to expel worms from the body. Externally, it is used as a poultice on snake bites, bee stings etc. In Nepal, a paste made from the fronds is applied to the forehead to relieve headaches and to the chest to relieve chest pains. The plant is best used fresh, though it can also be harvested in the summer and dried for later use (Plants for a Future: Database Search Results). Whole plant extract is expectorant used in cough and throat and bronchial disorders. Leaves mixed with honey are useful in seasonal cold fever in Pachmarhi India (15). Pleasant syrup is made in France from its fronds and rhizomes, called *Sirop de Capillaire*, which is given as a favourite medicine in pulmonary catarrhs. It is flavoured with orange flowers and acts as a demulcent with slightly stimulating effects. In the Peruvian Amazon, local people prepare the fronds of the plant as an infusion or syrup and use it as a diuretic, as an expectorant and to calm coughs, to promote perspiration and menstruation, and to treat urinary disorders, colds, rheumatism, heartburn, gallstones, alopecia (hair loss), and sour stomach. In the highlands of the Peruvian Andes, local shamans and healers decoct the rhizome and use it for alopecia, gallstones, and jaundice. In the Brazilian Amazon, it is recommended as a good expectorant and used for bronchitis, coughs, and other respiratory problems ( Raintree Nutrition: Tropical plant database).

***Adiantum philippense* (Linn.) (Fam-Pteridaceae)**

**Common name** – English name: Maiden hair fern, Indian name: Kalijhant

Roots thin and fibrous, petiole smooth with brown black hairs at base, fronds up to 25 cm long with half moon shaped pinnules. Sori marginal and discontinuous.

**Distribution:** India

**Uses:** Decoction of roots and rhizomes is used in fever. It is also useful in dysentery (15).

***Angiopteris evecta* (Hoffm.) (Fam – Marattiaceae)**

**Common name** – English name: Giant fern, Yapese name: Mong, Pohnpeian name: Peiwed (Poaiwed), Paiued, Chuukese name: Ammarre (chuuk lagoon).

Large sized ferns, rhizome short, broad, massive fleshy stock; fronds very large, bipinnate, springing from between two fleshy stipulae form appendages, stipes fleshy, green, swollen at the base; pinnae attached to the main rachis by swollen bases; pinnules attached to the pinnae by short swollen bases; pinnules attached to the pinnae by short swollen stalks; veins free, 6 recurrent veins, running from the margin between the true veins-sori of two close rows of sporangia attached along a vein near its apex, sporangia dehiscing along slits on the side facing the vein.

**Distribution:** Throughout the Indian region upto 7,000 feet elevation, also in Japan, Tropical Australia, New Caledonia, Madagascar and Polynesia.

**Uses:** In the southern highlands of Papua New Guinea the fronds of the giant fleshy terrestrial fern, *Angiopteris evecta* was bound on to the fractured limb. Swollen caudex used as starvation food in highland and low land areas of Papua New Guinea (14). This plant is very important in yap island because it is one of the common ingredients of the families secret medicines. This plant is believed to be a pain relieve and able to cool down the body temperature. The leaf can be gathered together and lay them down on the mat. Any person who has backache can lay on it during the night sleep. It cools down the body temperature and at the same time it helps massage the body and relief the pain. Its smell really helps the brain or head to calm down when people tired. The people like the smell especially the yapese so people like to have this as their laids. They will pick up the leaves and gather them in bundles then take the seeds for (ICE plant, Pohnpeian name) and grind it then spread on the leaf. The bundle with the grinded ice seed will then be covered with the betelnut leaf part that usually cover the betelnut when it is still small. They even sell this type of fern to people who want them. *Angiopteris evecta* yields an aromatic oil and is used for perfuming coconut oil in South Sea Islands (10). The rhizomes of *Angiopteris evecta* are used for scabies in India (18).

***Botrychium lunaria* (Sw.) (Fam – Ophioglossaceae)**

**Common name** – English name: Moonwort, French name: Herbe aux serpents, Petite lunaire, German name: Walpurgiskraut, Italian name: Vindicta.

Rhizome small, enclosed by brown sheaths and bearing stoutish branched roots, which are fleshy when fresh but brittle when dry. Stalk long, erect, smooth which is cylindrical hollow and succulent. Vernation of both the fertile and sterile segments erect.

**Distribution:** North India, Sikkim, Lachen, 11,000-13,000 feet elevation, Kumaon, 12,000 feet. Also the arctic and cold temperate zone, extending to South Europe; Patagonia; Australia.

Fronds solitary, long, firm and fleshy; sterile branch pinnate, oblong, pinnae sessile, flabellate

and often overlapping; veins flabellately forked. Fertile stalk long; fruiting spike racemose or paniculate; sporangia sessile, circular, brown, arranged in two rows on the dorsal face of the spike.

**Uses:** *Botrychium lunaria* used as a good vulnerary and also used in dysentery in India (9).

***Botrychium ternatum* (Sw.) (Fam – Ophioglossaceae)**

**Chinese name:** Yin Ti Chueh

Plants 18-75 cm high; common stalk 1-5 cm long; sterile stalk 4-20 cm long; sterile blade deltoid, tripinnate to quadripinnatifid, stalk of the pinnae long; sterile blade deltoid, tripinnate to quadripinnatifid, stalk of the pinnae long; sterile blade deltoid, tripinnate to quadripinnatifid, stalk of the pinnae long, apex acutish, veins simple or forked; fertile stalk 13-21 cm long, fruiting spike, deltoid, profusely compound.

**Distribution:** Near Simla, E. Himalaya – Australia, Tasmania, New Zealand, Japan, Lapland to Siberia, Pyrenees, United States Southwards to New Granada.

**Uses:** The plant is used as a vulnerary and the root is prescribed in dysentery in India (9).

***Botrychium virginianum* (Sw.) (Fam – Ophioglossaceae)**

**Common name:** Rattle snake fern, Grape fern, Indicator, Sang-Sign.

Stipes 3-18 inches long, sterile portion not prolonged beyond the fertile spike 4-12 inches each way; deltoid, quadripinnatifid, lower pinnae much the largest, pinnules ovate-oblong, close cut down to a broadly winged rachis into finely cut linear-oblong segments, both sides naked or slightly hairy; fertile branch of the rachis springing from the base of the sterile portion (i.e. sterile portion, sessile), or from the middle of it.

**Distribution:** South India, at the higher elevations on the western mountains (only appearing in the rains); Ceylon, about Newera Elya; North India, on the Himalayas, Kumaon to Bhotan, 5,000-8,000 feet elevation, Khasya, 4,000-6,000 feet elevation. Also widespread in Europe, America and Japan.

**Uses:** *Botrychium virginianum* is used in dysentery in India (9). According to Plants for a Future: Database Search Results, this large succulent fern is boiled and eaten in the Himalayas. The report does not say which part of the plant is used though it is probably the root. A poultice or lotion made from the roots is applied to snakebites, bruises, cuts and sores. A tea made from the roots is emetic, induces sweating and is expectorant. It is used in the treatment of lung ailments. The native of Americans found the blades had properties that were helpful in relieving the pain from open sores. Decoction of plant is given to children with illness (13), whereas decoction of roots is taken to cause vomiting (17). Decoction of root is boiled “down to syrup” and rubbed on snake bite (6). Plants used as a diaphoretic and as an expectorant (2). Decoction of the root is used as an emetic. Poultice of mashed, fresh root is applied to snakebite and used as repellent (5). Cold infusion of root and liquor is taken for the cough of consumption (7).

***Dicranopteris linearis* (Retz.) (Sw.) (Fam –Gleicheniaceae)**

**Common name** –Malay name: Resam, Indian name: Raj hans

Rhizome long, creeping with their tips covered with dense scale, fronds big, stiff and dichotomously branched, stipe hard, brownish 1.5-2 m long. Apical bud usually dormant, covered with broad ovate stipules. Sori globose, yellowish and present in a single row on both sides of the costules, spores minute, hyaline.

**Uses:** Young circinate vernate leaves mixed with cow milk used seven days continuously to remove sterility in women. Petiole and rachis are used in thatching the huts and widely sold as writing pens (India). Crushed leaves are applied as a poultice to control fever (Malaysia); the plant is used to get rid of intestinal worms (Indochina); to treat boils, ulcers and wounds (New Guinea).

***Helminthostachys zeylanica* (Linn.) (Fam – Ophioglossaceae)**

**Common name:** Kamraj, Dhimraj

Rhizome thick, fleshy, creeping and bearing many thick fleshy roots which become brittle when dry, common stalk fleshy, 20-30 cm long, sterile frond consisting of sessile palmately tripinnate lamina and a stalked fertile spike, and all these four parts separate from the apex of the common stalk; margin entire or slightly and irregularly toothed, veins fine, close, arising obliquely from the midrib and once or twice forked, fruiting spike bearing crowded short lateral branches, each with a sessile group of round sporangia.

**Distribution:** South India, western forests in swampy places up to 3,000 feet elevation, Ceylon, about Colombo and other parts of western and southern provinces, North India, Bengal plains to Assam and Cachar, Malay Peninsula. Also in Tropical Australia, Malay Islands, Philippines and New Caledonia.

**Uses:** The decoction of rhizome is used for curing impotency. The leaf juice relieves blisters on the tongue. The young leaves are cooked as vegetable. The powdered rhizome (5 gms) along with cow's milk is used for vitality and brain tonic. Its rhizome and about 5gms of rhizome of safed musli (*Chlorophytum tuberosum* Roxb. Baker.) and root of Semar musli (*Bombax ceiba* Linn.), are made into paste which is given for one month for waist pain as tonic in India (16). This species is an important village medicine in Moluccas with a decoction being used to treat boils and ulcers (12). Rumphius noted that the rhizome was chewed with Areca to treat whooping cough and other reports indicate its use to treat dysentery. It is used as a slight aperient in the Moluccas (9). *Helminthostachys* seems to be infrequently used in New Guinea due perhaps to its infrequent occurrence in most areas. This plant is also used for vitality and brain tonic. (18).

***Lygodium flexuosum* (Linn.) Sw. (Fam –Schizaeaceae)**

Fronds glabrous or slightly hairy, pairs of fronds stipitate-pinnate with the pinnules again pinnate or variously lobed or subpalmate, all serrulate, sori protruding from the margin, texture subcoriaceous.

**Distribution:** South India up to about 4,000 feet elevation, North India up to 5,000 feet elevation.

Also in the Malay Islands, Philippines, North Australia, Tropical Africa.

**Uses:** The aqueous extract of the rhizome given two times a day for 7 days cures gonorrhoea and the paste of the rhizome is applied on piles in India.(16)

***Marattia salicina* (Sm.) (Fam – Marattiaceae)**

Stipes thick, smooth deciduously scaly or swollen in the lower part, fronds long, bipinnate or sometimes tripinnate, pinnae long, pinnules oblong-lanceolate, broad, the apex acuminate, the base cuneate or slightly rounded, synangia submarginal in close rows.

**Distribution:** Central North Islands, Papua New Guinea.

**Uses** The swollen caudex also used as starvation food in highland and lowland areas of Papua New Guinea (4). According to the University of Auckland, New Zealand the rhizome is eaten by people of Central North Island. The scales were usually eaten roasted and considered a great delicacy. The roots required long cooking to be made palatable and were said to resemble a mild-flavoured potato. The baked or boiled roots were a source of starch in the diet. This plant was also used medicinally to cure diarrhoea.

***Ophioglossum reticulatum* (Linn.) (Fam – Ophioglossaceae)**

**Local name:** Brahmi

Rhizome cylindrical to subglobose, elongate, not tuberous with many horizontal roots; fronds one to several, sterile division placed generally below the middle, broadly ovate, ovate-orbicular, either cordate or broad-truncate at base, venation lax, distinctly reticulate, midrib usually indistinct, apex blunt or acute, fertile segment including the slender peduncle up to 20 cm long, sporangiferous portion long.

**Distribution:** South India, Nilgiris and Anamallays, 2,000 feet elevation and upwards, Ceylon, Newera Elya, Himalayas, Malay Peninsula. Also in Malay Islands, Polynesia, Tropical America, Africa, Mascareen Islands, Philippines.

**Uses:** The paste of the leaf is applied on the forehead to get rid of headache in India (16,18). *O. reticulatum* is known as van jhunki in Chhattisgarh, India. The natives of this region use this fern as sag (curry) for specific purposes. It is given to the women after child birth. The traditional healers informed that the use of this sag at this stage helps in preventing the body from infection. It also gives strength to the women (8).

***Ophioglossum vulgatum* (Linn.) (Fam – Ophioglossaceae)**

**Common name:** English name: Adder's Tongue, Christ's spear -; French name: Herbe a daucune, Herbe Sans Couture, Lance de Christ, Langue de Serpent, Luciole, ophioglosse, ophioglosse commune, petite serpenteaire, Serpentine -; Hausa name: Mashinzomo -; La Reunion name: Herbe un coeur, Herbe paille-en-queue, Langue de Serpent, Spanish name: Lengua de serpiente -; Suto name: Mmadiyo, Tsebe-ngive, Tseyanyane.

Plants 8-27 cm high; rhizome erect, cylindrical, bearing many fleshy roots, trophophyll ovate or ovate-oblong in shape, cordate at base, obtuse or acutish at apex, fleshy in texture, margin entire, venation with elongated primary areoles in the mid-vein area and with irregularly shaped closely woven small meshes with free vein-endings in the marginal area. Fertile stalk long, usually attached almost near the middle strobilus 2-3.5 cm long.

**Distribution:** Sikkim, Goke, 4,000 feet elevation, Darjeeling, 2,000 feet elevation, widely spread in Europe, Africa and its eastern islands, America, Japan, Australia, New Zealand and Sandwich islands.

**Uses:** The fresh leaves make a most effective and comforting poultice for ulcers and tumors. The expressed juice of the leaves is drunk as a treatment for internal bleeding and bruising ( American Nutrition Centre). The fresh leaves of *O. vulgatum* are used as a poultice in scrofulous ulcers and tumors, together with an infusion taken internally in wine glassful doses. The plant is boiled in oil or fat is said to be a panacea for wounds and to reduce inflammation. An ethnobotanical study in Northern Nigeria revealed that the dried pulverized rhizome of this fern is applied externally to ulcerated sores and wounds, and that the plant is also used in the treatment of burns .

The root and the leaves are antiseptic, detergent, emetic, haemostatic, styptic and vulnerary. An ointment made from the plant is considered to be a good remedy for wounds and is also used in the treatment of skin ulcers (Plants for a Future: Database Search Results). In England the Adder's Tongue has long had a reputation as a vulnerary. A preparation of it known as the "green oil of charity" is still in request as a remedy for wounds. The older herbalists called it 'a fine cooling herb'. The expressed juice of the leaves, drunk either alone or with distilled water of Horse Tail, used much to be employed by country people for internal wounds, vomiting or bleeding at the mouth or nose. The distilled water was also considered good for sore eyes.

## Discussion

With the present information it is clear that in hills and forests where majority of ferns and fern allies grow, natives frequently use their young fronds and dried rhizomes as source of food and extracts of different parts and their decoction as medicine for various ailments. The study highlights the traditional uses of ferns by the tribals in the treatment of their diseases and ailments. These data may be useful for phytochemists and pharmacologists to determine their true therapeutic compounds. It may bring to light new sources of drugs of herbal origin. Many medicinal plants are reported to be threatened to extinction. Of course, large numbers of medicinal plant species are endangered or are under immediate danger of loss, while various species are vulnerable mainly due to indiscriminate collection as well as excessive trade from natural population for commercial purpose. So there is an urgent need for their conservation. There has been much emphasis to conserve the ferns which are important for academic, medicinal and ornamental values.

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