MEDICINALLY IMPORTANT FERNS
Chapter - 7
MEDICINALLY IMPORTANT FERNS

In documenting the medicinal uses of ferns, an exhaustive literature survey was carried out and an attempt made to provide comprehensive information on their potential medicinal applications. Observations from the field and personal communications with traditional healers were also undertaken to add to the knowledge of medicinal ferns. Only the ferns from the Valley of Kashmir are discussed, “because quite a many of ferns from the area are of medicinal value” (Chopra et al., 1956).

For the presentation of data, all the species are arranged alphabetically for easy reference. Botanical name, family, common/vernacular names (wherever available), classical use (wherever available), parts used, medicinal properties, chemical constituents etc. for each species are provided.

1. Adiantum capillus-veneris L.

   Family: Adiantaceae.

   Common Name: Maiden Hair Fern/Venus Hair Fern (English); Geuwtheer/Dumtuli (Kashmiri); Hamaspadi/Hansraj (Hindi).

   Parts Used: Whole plant; Fronds.

   Classical Use: Charaka prescribed the Maiden Hair Fern for affections due to vitiated blood. The spores were prescribed externally in suppurations due to poisonous bites and rheumatic conditions. Sashruta used the herb internally in respiratory troubles, wasting diseases, internal tumours and swelling due to glandular enlargement. The nasal drops, prepared by boiling the root in oil, were instilled in nose as a decongestant in hoarseness of voice (Ashtaanga Hridaya) (Khare, 2004).
During the 16th Century, *Hamaspadi* was the drug of choice for alleviating asthma, cough, diarrhoea, dysuria, hard swellings, inflammatory diseases, septic conditions and vitiated blood. It was used as anti-septic, blood purifier, cooling, demulcent, diuretic, emmenagogue, emollient, febrifuge, pectoral, stimulating and styptic. Many prescriptions for crysipelas, foul ulcers, infected wounds and spider-poison contained this herb (Khare, 2004).

John Gerard (1545-1612) wrote of it: "It consumeth and wasteth away King's Evil and other hard swellings and it maketh the haire of the head or beard to grow that is fallen and pulled off" (swollen lymph glands caused by tuberculosis were called 'King's Evil'). Nicholas Culpeper (1616-1654) advocated the virtues of the herb in no uncertain terms: "The decoction of the Maiden Hair being drunk helps those that are troubled with cough, shortness of breath, the yellow jaundice, diseases of the spleen, stopping of the urine, and helps exceedingly break the stone in the kidneys. It provokes women's courses, and stays both bleedings and fluxes of the stomach and belly, especially when the herb is dry: for being green, it loosens the belly and voids choler and phlegum, cleanses the lungs and rectifies the blood. The herb, boiled in oil of camomile, dissolves knots, allays swellings and dries up moist ulcers" (Khare, 2004).

Eighteenth Century herbalist Keogh used this fern to cure asthma, cough, diarrhoea, jaundice, shortness of breath, spitting of blood and biting of mad dogs. He also used it to provoke menstruation and urination and break up stones in the bladder, kidneys and spleen (Guna, 2003).

In the West, the fern is known for its use as a demulcent, emmenagogue, emollient and expectorant. The fern is boiled in wine and drunk in cases of affections of spleen, liver and other viscera. It is also found useful in cold inposthumes (purulent swellings or abscess) of the uterus; also in hard swellings and sores (Khare, 2004). *Maiden Hair Fern* is used by Western herbalists to treat cough, bronchitis, catarrh, sore throat and chronic nasal catarrh. The plant also has a long-standing reputation as a remedy for conditions of the hair and scalp (Prajapati et al., 2004; Bhattacharjee, 2004).
At Colomas (Mexico), this plant is used as tea to relieve colic, but at Colothan, it is taken as a tea for amenorrhea. The herb is an expectorant, mucilaginous and pectoral, and is used as a popular cough medicine throughout most parts of Europe. It has also been used as an emmenagogue. It may be used in all coughs, throat affections and bronchial disorders. The Sutos smoke the leaf for head and chest colds (Kirtikar and Basu, 1935).

In Philippines, fronds are used for chest diseases and as an emmenagogue (Kumar et al., 2003). In Punjab (India), the leaves along with pepper are administered as a febrifuge, and in South India, when prepared with honey, they are used in catarrhal affections (Watt, 1889-1892; Kirtikar and Basu, 1935).

The decoction of leaves is taken for acute bronchitis and fever. Tea made from the leaves is widely used in coughs resulting from colds, nasal congestion and catarrh. It is also taken along with tea in abnormal stoppage of menses (Bhattacharjee, 2004).

**Medicinal Properties:** This plant is used in the preparation of 'Sirop de Capillaire' of Europe. This syrup is largely used in Italy and Greece in the treatment of chest complaints (Watt, 1889-1892). The herb has also entered into many compositions in the West. It is employed as an emmenagogue under the names of 'Polytrichi,' 'Polytrichon' or 'Kalliphytalon,' administered as a sweetened infusion of 1 oz (30 cc) to a pint (568 cc) of boiling water (Khare, 2004).

This plant is a weak expectorant, bechic, weak emmenagogue and weak diuretic, and is principally employed in chest complaints such as respiratory catarrh and coughs. Once it was used in the treatment of both pleurisy and asthma, but with little effect in the latter (Stuart, 1979).

Whole plant is demulcent, expectorant and febrifuge, and also used as a hair tonic. Powdered fronds are given with honey against bad cold (Kaul, 1997), extract used against fever (Naqshi et al., 1992), used as an emmenagogue (Chopra et al., 1956). It has anti-microbial and hypoglycaemic properties (Mahmoud et al., 1989; Neef et al., 1995). It is anti-odontalgic and anti-inflammatory. Powdered fronds are applied on gums and tooth cavities during
toothache and dental abscesses (Teresa Palmese et al., 2001). Ethanol extract of 1 gm of rhizome per ml of alcohol exhibits strong activity against Vesicular Stomatitis Virus (Husson et al., 1986). The fern is used as a pectoral demulcent. It is boiled in wine in cases of hard tumours of spleen, liver and other viscera (Anonymous, 1986).

**Chemical Constituents**: Maiden Hair Fern contains Astragalin, Iso-quercitrin, Kaempferol-3-o-Rutinoside Sulphate, Nicotiflorin, Rutin (Singh and Vishwanathan, 1996; Singh, 2003; Sood et al., 2005); 1-Caffey Glucose, 1-Coumaryl Galactose and Homoserine isolated from fronds (Singh and Vishwanathan, 1996; Sood et al., 2005); bitter principle- Capillarine, Gallic acid, minute quantities of an essential oil, Mucilage, Tannins, Sugars (Stuart, 1979; Bhattacharjee, 2004; Prajapati et al., 2004). It also contains Flavonoids, tannin material- Mucin, terpenoids and heterosides of Kaempferol, Luteolol and Quercetol (Bhattacharjee, 2004; Prajapati et al., 2004); Genistein, Hesperidin, Naringenin and Sulphuretin (Singh, 2003).


**Indications**: Alopecia, Asthma, Cephalosis, Childbirth, Chill, Constipation, Cystosis, Dropsy, Head cold, Hepatosis, Pulmonosis, Sclerosis, Snakebite, Stone, Water retention (Duke and Ayensu, 1985); Bronchosis, Cough, Diabetes, Gray hair, Hyperglycaemia, Pain, Pertussis (Duke, 2002); Catarrh, Fever (Watt, 1889-1892; Duke and Ayensu, 1985); Cold (Duke and Ayensu, 1985; Anonymous, 2000); Dysmenorrhoea, Rhinosis (Duke and Ayensu, 1985; Duke, 2002); Gravel (Grieve, 1931; Duke and Ayensu, 1985); Headache (Anonymous, 2000); Insanity, Rheumatism, Sting (Moerman, 1998); Jaundice, Nephrosis,
Pleurisy, Swelling (Grieve, 1931); Respirosis (List and Hohamer, 1969-1979; Duke and Ayensu, 1985; Duke, 2002).

**Contraindications:** Not for use during pregnancy (Duke, 2002); also emetic in large doses (Khare, 2004).

2. *Adiantum incisum* Forssk.

**Family:** Adiantaceae.

**Common Name:** Hansraj (Hindi).

**Parts Used:** Whole plant; Fronds; Pinnules; Petioles.

**Classical Use:** This fern is equated with *Mayurashikhaa*, *Neelakantha Shikhaa* of *Bhaavaprakaasha*, and *Barhi Shikhaa* of *Ashtaanga Hridaya* and *Gadanigraha*; largely used as a substitute for *Adiantum capillus-veneris* (Khare, 2004).

*Mayurashikhaa* is said to be one of the fertility promoting herbs of classical Indian texts. At many places in Ayurvedic texts, *Mayurashikhaa* has been recommended to women for conceiving 'male' child. In *Gadanigraha*, the root of *Mayurashikhaa*, pounded with milk, was prescribed to the women in season for achieving conception. According to Ayurvedic texts, *Mayurashikhaa* is cooling, astringent, anti-inflammatory, haemostatic tonic to genito-urinary tract; alleviates vitiated blood; indicated in asthma, bronchitis, cough, diarrhoea, dysentery, dysuria; used internally as well as externally for infected wounds, ulcers, erysipelas (*Kaiyadeva Nighantu, Bhaavaprakaasha*). *Ashtaanga Hridaya* recommends the root with rice water for gravels and calculi. The herb was not used in Yunani medicine, though its references were available during 16th Century (Khare, 2004).

**Medicinal Properties:** The fern is aromatic, astringent, febrifuge and tonic. It is also used in hemicranias. The fronds are externally used in skin diseases and their juice for diabetes (Khare, 2004). The leaf powder of this fern is mixed with butter and used for controlling the internal burning of body; also used in cough, diabetes and skin diseases (Bhattacharjee, 2004). The young primules of this fern are eaten raw to cure diabetes (Sood *et al.*, 2005).

The aqueous and acetone extract of pinnules and petiole of this fern have shown inhibitory effect against *Salmonella typhii* (Parihar *et al.*, 2003).
In India, fronds of Adiantum incisum are largely used as a substitute for Adiantum capillus-veneris. A typical Indian application for this fern is promoting conception in women, which is based on indirect inference from the genito-urinary healing properties of ferns (Khare, 2004).

**Chemical Constituents:** Adiantone, Adiantanore-iso-adiantone, Fernene steroids, Hentriacontane, 16-Hentriacontanone, β-sitosterol (Singh, 2003; Khare, 2004; Sood et al., 2005); Tri-terpenoids and Flavonoids (Sood et al., 2005).


**Contraindications:** Emetic in large doses (Khare, 2004).

3. Adiantum pedatum L.

**Family:** Adiantaceae.

**Common Name:** Northern Maiden Hair Fern/Pointer Weed (English).

**Parts Used:** Rhizome; Fronds.

**Medicinal Properties:** This is the French official species used in the preparation of the 'Sirop de Capillaire.' The leaves are bitterish and aromatic, and have been supposed to be useful in chronic catarrhs and other pectoral affections. *A. capillus-veneris* has similar properties though is feebler (Watt, 1889-1892). It is still used in North America as a pectoral in chronic catarrhs (Kirtikar and Basu, 1935). *A. pedatum* is used like *A. capillus-veneris* "in similar ways and more highly valued by many" (Grieve, 1931).

**Chemical Constituents:** Adiantone, Adipedaol, Caffeic acid, Fatty acids, Fernene, Ferulic acid, Filicene, Filicinal, Iso-fernene, p-Coumarin, p-Hydro Benzoic acid, Protocatechuic acid, Sterols, Tannin, Vanillic acid, Volatile oil (Singh, 2003).

**Activities:** Astringent, Emmenagogue, Stimulant, Tonic (Singh, 2003); Anti-rheumatic (List and Hohammer, 1969-1979); Demulcent (Duke, 2002; Singh, 2003); Diuretic (Moerman, 1998; Anonymous, 2000); Emetic (Moerman, 1998); Expectorant (List and Hohammer, 1969-1979; Duke, 2002; Singh, 2003); Pectoral (Watt, 1889-1892; Duke, 2002); Propecic (Duke, 2002);
decoction of rhizome used in chronic catarrh, cold, cough, hoarseness (Singh, 2003).


**Contraindications**: Not for use during pregnancy (Duke, 2002).

4. Adiantum venustum D. Don.

**Family**: Adiantaceae.

**Common Name**: Gemvtheer (Kashmiri).

**Parts Used**: Whole plant; Fronds; Rhizome.

**Medicinal Properties**: The native physicians consider this fern to be deobstruent and resolvent, useful for curing the *prima viae* of bile, adjust bile and phlegm; also pectoral, expectorant, diuretic and emmenagogue. Used as a plaster, it is considered to be discutient, and is applied to chronic tumours of various kinds (Watt, 1889-1892). It is recommended by Hakims for hydrophobia. It is resolvent and is also used for the prevention of hair from falling. For internal use, it is given in the form of syrup (Watt, 1889-1892).

It possesses aromatic and astringent properties, is emetic in large doses, and is an expectorant, febrifuge and tonic. In Chamba, it is pounded and applied to bruises *etc.*, and the plant appears to supply in the Punjab most of the official *Hansraj*, which is administered as an anodyne in bronchitis, and is considered diuretic and emmenagogue (Watt, 1889-1892; Kirtikar and Basu, 1935).

The plant is very useful as mild tonic, especially during convalescence from fevers. A vapour bath medicated by a decoction from this plant is regarded useful in fever. It is resolvent, and is used for the prevention of hair from falling (Watt, 1889-1892; Kirtikar and Basu, 1935).
An oil extract of this plant is applied to piles and tuberculous glands and wounds; also to bring out a thorn, which has penetrated into the body (Yunnani) (Kirtikar and Basu, 1935). The plant has diuretic and astringent properties. Fronds are used as tonic, expectorant and in scorpion sting (Razdan, 1986). The fern is commercially gathered from Chakrata Hills for dermatological pharmaceutical preparations (Khullar, 1994).

**Chemical Constituents:** Adiantone, α Carotene mono-epoxide, Kaempferol, Leuco-pelargonidin, Quercetin glucosides, traces of 3-Filicene (Singh, 2003; Sood et al., 2005); a new Ketol-2-1-Hydroxy-3-o-Norhopan-22-one (I), Triterpenoid keto alcohol (Sood et al., 2005); 21 Hydroxy Adiantone (Singh, 2003).

**Activities:** Aphrodisiac, Bitter, Deobstruent, Purgative, Resolvent (Kirtikar and Basu, 1935); Anodyne, Anti-cancer, Anti-tuberculosis, Anti-viral, Aromatic, Astringent, Emetic, Febrifuge, Tonic; used in bronchitis, ophthalmia and prevents hair fall (Singh, 2003); Diuretic (Kirtikar and Basu, 1935; Razdan, 1986; Singh, 2003); Emmenagogue; Expectorant (Kirtikar and Basu, 1935; Singh, 2003).

**Indications:** Biliousness, Colds, diseases of the chest, Headache, Humours, Hydrophobia, Inflammations, Ophthalmia, Phlegmatic tumours (Kirtikar and Basu, 1935).

5. **Asplenium adiantum-nigrum L.**

**Family:** Aspleniaceae.

**Common Name:** Black Spleenwort (English); Sheen-gassa (Kashmiri).

**Parts Used:** Whole plant; Rhizome.

**Medicinal Properties:** The plant is bitter, diuretic, laxative, and is useful in treatment of ophthalmia, jaundice (Kirtikar and Basu, 1935; Razdan, 1986; Singh, 2003) and diseases of the spleen (Kirtikar and Basu, 1935; Razdan, 1986). It also lessens inflammation, hiccup and produces sterility in women (Yunnani; Singh, 2003). A decoction or syrup of the fronds is used as an expectorant (Razdan, 1986), pectoral and emmenagogue in Europe (Kirtikar and Basu, 1935). The rhizome is used as an anthelmintic by the Sutos (Kirtikar and Basu, 1935; Singh, 2003).
6. *Asplenium ceterach* L.
   *Family:* Aspleniaceae.
   *Common Name:* Rusty Black Fern (English).
   *Parts Used:* Whole plant.
   *Medicinal Properties:* The plant has diuretic properties, is used against complaints of spleen (Razdan, 1986; Singh, 2003) and is astringent (Razdan, 1986).

7. *Asplenium dalhousiae* Hook.
   *Family:* Aspleniaceae.
   *Parts Used:* Whole plant.
   *Medicinal Properties:* Whole plant is anti-bacterial (Singh, 2003).

8. *Asplenium ramosum* L.
   *Family:* Aspleniaceae.
   *Common Name:* Green Spleenwort (English).
   *Parts Used:* Fronds.
   *Medicinal Properties:* Fronds are applied on burns (Singh, 2003).

9. *Asplenium ruta-muraria* L.
   *Family:* Aspleniaceae.
   *Common Name:* Tent Wort/Wall Rue (English).
   *Parts Used:* Whole plant; Fronds.
   *Medicinal Properties:* This small herb is used as deobstruent and expectorant (Kirtikar and Basu, 1935; Singh, 2003). It is likewise good for them that have cough, or are short-winded, or be troubled with stitches in the sides. The leaves are used as a remedy for the cure of rickets (Kirtikar and Basu, 1935; Singh, 2003); also used against knots and swellings (Singh, 2003).

10. *Asplenium trichomanes* L.
    *Family:* Aspleniaceae.
    *Common Name:* Delicate Maiden Hair Spleenwort (English).
    *Medicinal Properties:* It is used as laxative and expectorant (Kirtikar and Basu, 1935; Razdan, 1986; Singh, 2003). The leaves are smoked by the Sutos for colds in the head and chest (Kirtikar and Basu, 1935; Razdan, 1986).
   
   **Family:** Athyriaceae.
   
   **Parts Used:** Sporophyll.
   
   **Medicinal Properties:** The sporophylls of this fern possess anti-bacterial properties (Singh, 2003).

   
   **Family:** Azollaceae.
   
   **Parts Used:** Whole plant.
   
   **Medicinal Properties:** Anti-bacterial, Anti-fungal (Singh, 2003).
   
   **Chemical Constituents:** Proteins, Carotenoids (Singh, 2003).

13. *Botrychium lunaria* (L.) Sw.
   
   **Family:** Botrychiaceae.
   
   **Common Name:** Moonwort (English).
   
   **Medicinal Properties:** The plant is a good vulnerary and is used in dysentery also (Kirtikar and Basu, 1935; Singh, 2003). It is culinary and has anti-cancer properties (Singh, 2003).

14. *Botrychium virginianum* (L.) Sw.
   
   **Family:** Botrychiaceae.
   
   **Parts Used:** Whole plant; Rhizome.
   
   **Medicinal Properties:** Whole plant is anti-dysenteric and anti-bacterial; rhizome is vulnerary (Singh, 2003).
   
   **Chemical Constituents:** Caffeic acid, p-coumaric acid, p-Hydroxybenzoic acid (Singh, 2003).

15. *Cheilanthes dalhousiae* Hook.
   
   **Family:** Sinopteridaceae.
   
   **Parts Used:** Fronds; Rhizome.
   
   **Medicinal Properties:** Fronds have anti-fungal properties; rhizome is anti-bacterial (Singh, 2003).
Chemical Constituents: Genkwanin, Kaempferol, Kumatakenin, Quercetin, Rhamnocitrin (Singh, 2003).

16. **Cyrtomium caryotideum** (Wall. ex Hook. et Grev.) Presl.
   
   *Family:* Dryopteridaceae.
   
   *Parts Used:* Whole plant.
   
   *Medicinal Properties:* Whole plant is anti-bacterial and anthelminthic (Singh, 2003).

17. **Cystopteris fragilis** (L.) Bernh.
   
   *Family:* Athyriaceae.
   
   *Common Name:* Fragile Fern/Brittle Fern/Bladder Fern (English).
   
   *Parts Used:* Rhizome.
   
   *Medicinal Properties:* Decoction of rhizome is used as an anthelminthic (Razdan, 1986; Singh, 2003).

18. **Dryopteris barbigera** (T. Moore ex Hook.) O. Ktze.
   
   *Family:* Dryopteridaceae.
   
   *Parts Used:* Rhizome.
   
   *Medicinal Properties:* Rhizome is anthelminthic (Singh, 2003; Mittal and Bir, 2006).
   
   *Chemical Constituents:* Filicene (Singh, 2003); Oleoresin (7-9%). Filicin (2.2%) (Mittal and Bir, 2006-2007).

19. **Dryopteris blanfordii** (Hope) C. Chr.
   
   *Family:* Dryopteridaceae.
   
   *Parts Used:* Rhizome.
   
   *Medicinal Properties:* Rhizome is anthelminthic (Singh, 2003; Mittal and Bir, 2006).
   
   *Chemical Constituents:* Filicene (Singh, 2003); Oleoresin (8-10%). Filicin (2.6%) (Mittal and Bir, 2006-2007).

20. **Dryopteris chrysocoma** (Christ) C. Chr.
   
   *Family:* Dryopteridaceae.
   
   *Parts Used:* Rhizome.
Medicinal Properties: Rhizome is anthelmintic (Singh, 2003; Mittal and Bir, 2006).

Chemical Constituents: Filicene (Singh, 2003); Oleoresin (14-17%), Filicin (4.3%) (Mittal and Bir, 2006-2007).


Family: Dryopteridaceae.

Common Name: Male Fern (English).

Parts Used: Whole plant; Fronds; Rhizomes; Oleoresin extracted from the root.

Classical Use: In Yunnani medicine, the drug obtained from the fern is used in prescriptions as an anthelmintic. The powder is dusted over wounds and ulcers; mixed with oil, applied over the scalp for killing lice. Internally the drug is an irritant and is invariably prescribed with anti-spasmodic and soothing herbs (Khare, 2004).

Medicinal Properties: Male Fern root or its oleoresin is used as a specific treatment for tapeworms. It acts by paralysing the muscles of the worm, forcing it to relax its hold on the gut wall. The root is prescribed with non-oily purgative. Preparations of Male Fern are used externally for rheumatism, muscle pain, neuralgia and sciatica (Khare, 2004).

Chemical Constituents: Desaspidin, Filicin, Filinic acid, Paraspdin, Trisflavaspidic acid (Singh, 2003; Khare, 2004); Albaspdin, Arachidic acid, Aspigin, Aspidinol, Butanonephloroglucosides, Butyric acid, Caffeic acid, Femene, Ferulic acid, Filicybutanone, Filmarone, Flavaspidic acid, Glucose, Hexanol, Hopadiene, Hopene, Hydroxybenzoic acid, Isobutyric acid, Linoleic acid, Linolenic acid, Margaspidin, Octanol, Palmitic acid, p-Coumaric acid, p-Protocatechuic acid, Phlobaphene, Phloraspidinol, Phloraspinphloraspyrone, Phloroglucin, Phloropyron, Protocatechuic acid, Pseudoaspidin, Sugars, Tannins, Trisaspdin, Trisdesaspdin, Vanillic phenolic acids (Singh, 2003). In addition, the fern contains triterpenes, alkanes, a volatile oil and resins (Khare, 2004).

Activities: Abortifacient, Anti-bacterial, Anti-septic (Gupta, 1995); Anthelmintic (Razdan, 1986; Singh, 2003); Anti-viral (Duke, 2002; Singh, 2003); Anti-cancer, Anti-fungal, Anti-rheumatic (Singh, 2003); Contraceptive
(Gupta, 1995; Singh, 2003); Cytotoxic (Duke, 2002); Aperient, Astringent, Cyanogenic, Insecticide (Duke, 1985; Singh, 2003); Laxative, Poison (Duke, 1985); Pectoral (Steinmetz, 1957; Duke, 1985); Taenifuge (Duke, 1985; Williamson and Evans, 1988); Vermifuge (Grieve, 1931; Duke, 1985; Razdan, 1986; Williamson and Evans, 1988; Duke, 2002).

**Indications:** Bacteria, Flu, Herpes, Stomatosis (Gupta, 1995); Cancer, Constipation, Epistaxis, Metrorrhagia, Puerperium (Duke, 1985); Dentition, Earache, Fluke, Hepatosis, Myalgia, Neuralgia, Ophthalmia, Pain, Rheumatism, Toothache (Duke, 2002); Induration (Hartwell, 1982); Infection, Virus (Gupta, 1995; Duke, 2002); Rickets (Grieve, 1931); Sciatica (List and Hohammer, 1969-1979; Duke, 2002); Tapeworm (Duke, 1985; Williamson and Evans, 1988; Duke, 2002); Worm (Grieve, 1931; Duke, 1985; Williamson and Evans, 1988; Duke, 2002); Wound (Grieve, 1931; Duke, 1985; Duke, 2002).

**Contraindications:** Canadians do not allow its use as a non-medical ingredient for oral use products (McGuffin et al., 1997). In too large doses, it is an irritant poison, causing muscular weakness and coma, particularly injurious to eyesight, even causing blindness. Other symptoms include convulsion, delirium, diarrhoea, nausea, tremors, vertigo and cardiac or respiratory failure; allergenic to some and can be fatally poisonous if misused. It should be used only by prescription from a doctor, and “I doubt many doctors will prescribe it” (Duke, 1985); also contraindicated in anaemia, cardiopathy, diabetes, hepatosis and nephrosis (Duke, 2002).

22. *Dryopteris ramosa* (Hope) C. Chr.

*Family:* Dryopteridaceae.

*Parts Used:* Rhizome.

*Medicinal Properties:* Rhizome is anti-bacterial (Singh, 2003) and anthelmintic (Mittal and Bir, 2006).

*Chemical Constituents:* Oleoresin (12-15%), Filicin (3.8%) (Mittal and Bir, 2006-2007).

23. *Dryopteris serrato-dentata* (Bedd.) Hay.

*Family:* Dryopteridaceae.

*Parts Used:* Rhizome.
**Medicinal Properties:** Rhizome is anthelminthic (Mittal and Bir, 2006).

**Chemical Constituents:** Oleoresin (8-11%), Filicin (2.9%) (Mittal and Bir, 2006-2007).

24. *Dryopteris xanthomelas* (Christ) C. Chr.

*Family:* Dryopteridaceae.

*Common Name:* Shuttlecock Fern (English).

*Parts Used:* Rhizome.

**Medicinal Properties:** Rhizome is anthelminthic (Mittal and Bir, 2006).

**Chemical Constituents:** Oleoresin (9-11%), Filicin (2.3%) (Mittal and Bir, 2006-2007).

25. *Marsilea minuta* L.

*Family:* Marsileaceae.

*Common Name:* Pajlu (Kashmiri) (Sood et al., 2005); Chaupatti (Hindi).

*Parts Used:* Whole plant; Leaves; Petiole; Rhizome.

**Medicinal Properties:** The decoction of leaves, along with ginger is used against bronchitis and cough (Bhattacharjee, 2004). Plants are used in cough, spastic condition of leg, muscles *etc.*, and also in insomnia and sedatum. The plants are known to be acrid, anodyne, aphrodisiac, astringent, depurative, diuretic, emollient, expectorant, febrifuge, hypnotic, ophthalmic and refrigerant. It is useful in diarrhoea, dyspepsia, fever, haemorrhoids, leprosy, ophthalmia, psychopathy, skin diseases and strangury (Warrier *et al.*, 1996; Kumar *et al.*, 2003).

Aqueous extract of leaflets and acetone extract of petiole and rhizome have shown inhibitory effect on human pathogenic bacteria, *Salmonella typhii* (Parihar *et al.*, 2003). The herb has also shown anti-fungal activity against *Aspergillus flavus* (Parihar *et al.*, 2002).

**Chemical Constituents:** β-carotene, Calcium, Phosphorus, Potassium, Protein (24-36%), Sodium (Kumar *et al.*, 2003; Singh, 2003); Marsilene (Singh, 2003).

**Activities:** Alexiteric, Anti-bacterial, Anti-convulsant, Anti-fungal, Anti-rheumatic, Anti-tussive, Diuretic, Refrigerant, Resolvent, Sedative (Singh, 2003).

   Family: Cryptogrammaceae.
   Parts Used: Whole plant.
   Medicinal Properties: Whole plant is anti-bacterial (Singh, 2003).

27. Ophioglossum reticulatum L.
   Family: Ophioglossaceae.
   Common Name: Chonchur (Kashmiri).
   Parts Used: Fleshy fronds; Rhizome.
   Medicinal Properties: The herb is used as a cooling agent and in the treatment of inflammations and wounds; fronds used as a tonic and styptic; also in contusions and haemorrhages (Singh, 1999; Kumar et al., 2003).

28. Osmunda claytoniana L.
   Family: Osmundaccae.
   Common Name: Interrupted Fern (English).
   Parts Used: Whole plant; Rhizome.
   Medicinal Properties: The rootstock and stipe bases of this fern are employed as adulterant, as a substitute for the Male Fern (Razdan, 1986); whole plant is anti-bacterial (Singh, 2003).

29. Polystichum squarrosum (D. Don) Fee.
   Family: Dryopteridaceae.
   Parts Used: Fronds; Sporophylls.
   Medicinal Properties: The sporophyll extract of this fern is used as an anti-bacterial agent (Singh, 1999; Kumar et al., 2003; Singh, 2003); fronds are anti-rheumatic (Singh, 2003).

30. Pteris cretica L.
   Family: Pteridaceae.
   Parts Used: Fronds.
   Medicinal Properties: The fronds, which are anti-bacterial, are made into paste and applied to wounds (Singh, 1999; Kumar et al., 2003; Singh, 2003).
31. Pteris vittata L.
   
   **Family:** Pteridaceae.
   
   **Common Name:** Chinese Brake Fern (English).
   
   **Parts Used:** Whole plant; Fronds.
   
   **Medicinal Properties:** Plant extract is used as anti-bacterial and anti-viral agent (Singh, 1999; Kumar *et al.*, 2003); demulcent, hypotensive, tonic (Singh, 1999; Kumar *et al.*, 2003; Singh, 2003). The tribal *Chenchu* people of Andhra-Pradesh (India) use the herb juice in curing diarrhoea and dysentery.
   
   **Chemical Constituents:** Phenols (Singh, 2003).

32. Salvinia molesta Mitchell.
   
   **Family:** Salviniaceae.
   
   **Common Name:** Giant Water Fern (English).
   
   **Parts Used:** Whole plant.
   
   **Medicinal Properties:** Plant is used as an anti-fungal agent (Kumar *et al.*, 2003; Singh, 2003).
   
   **Chemical Constituents:** Calcium, Iron, Phosphorus, Protein and Tannin (Singh, 1999; Kumar *et al.*, 2003; Singh, 2003).

33. Sphenomeris chinensis (L.) Maxon.
   
   **Family:** Lindsaeaceae.
   
   **Common Name:** Parsley Fern (English).
   
   **Parts Used:** Leaves; Whole plant.
   
   **Medicinal Properties:** The fern is used medicinally in China and Mauritius (Kirtikar and Basu, 1935). Leaves are used internally for Chronic Enteritis in Mauritius (Kirtikar and Basu, 1935; Kumar *et al.*, 2003; Singh, 2003).
   
   **Chemical Constituents:** The leaves contain Proto-catechu-aldehyde, Proto-catechuric acid, Syringic acid and Vitexin (Kumar *et al.*, 2003; Singh, 2003).

34. Thelypteris arida (D. Don) Morton.
   
   **Family:** Thelypteridaceae.
   
   **Parts Used:** Rhizome.
   
   **Medicinal Properties:** Rhizome is used against veterinary larval infections (Singh, 2003).