NBU Journal of Plant Sciences, Vol.2 : 86-93, 2008

Ethnic uses of some pteridophytic weeds of tea gardens in Darjeeling and Terai

C. Ghosh, R.Biswas and A.P. Das
Taxonomy and Environmental Biology Laboratory, Department of Botany,
North Bengal University, Siliguri 734013, WB, India

Abstract

Pteridophytes occupy a recognisable position in the flora of Terai and the hills of Darjiling. They are also well represented as weed in the Tea Gardens of this area. Recent survey recorded the occurrence of 86 species of pteridophytes from nine such gardens covering both Terai and Darjiling Hills. Of these, 25 species (30%), covering 21 genera and 20 families, are used by the Tea Garden workers in different manner like (i) 10 species as food, (ii) 02 species for fermenting traditional liquor, (iii) 01 species as fodder and (iv) 22 species as medicine for human diseases. In addition, some of these plants are used for basketry, playing carom, ceremonial decoration, ornamentals etc.

Keywords: Ethnobotany, Terai, Darjiling Hills, Pteridophytes.

Introduction

The documentation of ethnic uses of plants and other natural resources is extremely important (Al Corn 1995). Man, during his survival within the natural surroundings learnt the uses of innumerable types of natural resources to meet up his wide range of needs like food, medicine, house building materials, religious articles, fodder for his pets, ornamental and decorative articles, etc. But, in the present developing society the existence of traditional knowledge is becoming endangered. It is also now realized that in this 21st century the traditional knowledge will play a big role in health care and that includes mainly food, medicine and cosmetics (Pushpangadan 2002).

In addition, even today there are thousands of human settlements in different corners of this planet where facilities of modern civilization are yet to arrive or difficult to utilize. And, in those areas people are surviving with the help of their traditional knowledge on the uses of local resources. But, in most of the places, around the world, the inroad of industry and market dependent life style is forcing the local people to forget or to give up their traditional practices (Cotton 1996).

Three T's, "*Tea, Timber & Tourism*" formed the economic backbone for the people of Darjiling district of West Bengal, Terai and Duars. With the steady decline of forest cover timber economy is minimized and the tourism depends on numerous factors. But, the number of Tea Gardens in this area is increasing even today. A very large proportion of area of Darjiling, Terai and Duars are covered with Tea Gardens though most of these areas were basically forest covered. That means, Tea Gardens have replaced basically biodiversity-rich vegetation (Das 2004).

After the replacement of natural vegetation with tea plantations many local species tried to survive within the gardens as weeds. Recent survey on Tea Garden weeds in Darjiling Hills recorded the existence of large number plants. And, the ethnobotanical part of the survey revealed

the usefulness of such weeds (Ghosh *et al* 2004). The distribution and harm/usefulness of tea weeds has attracted the attention of many other workers like Dutta (1983), Haridas & Sharma (1972), Haridas & Venkataramani (1972), Harikrishnan (1978), Mustafee (1972, 1981, 1988, 1998), and Ramachandran (1978).

Tea Gardens need a big workforce to maintain it's all the activities and numerous people belonging to different tribal communities like Santhals, Oraons, Mundas from outside and different local groups like Rajbansies, Lepchas and Nepali communities work in these gardens round the year. Most of these TGs are situated in remote areas where the basic amenities of modern civilization are unavailable and in addition, they are very poorly paid. And, that is why they are quite dependent on local natural resources for their survival. As part of their daily needs they use numerous local plants, majority of which are weedy and, in general, are not directly useful in the civilised society (Ghosh 2006). The present study was undertaken to record the ethnic knowledge of some pteridophytic weeds of Darjeeling Tea Gardens and the understanding of these people with the local species of plants.

Study Area

The present study was undertaken in nine tea gardens of Darjiling District, namely:
(1) *Gungaram Tea Estate* [±122 m amsl; 26° 37' 409" N Latitude & 88° 18' 167" E Longitude].
(2) *Hansqua Tea Estate* [±125 m amsl; 26° 37.784' N Latitude & 88° 19.068' E Longitude].
(3) *Matigara Tea Estate* [±130 m amsl; 26° 42' 500" N Latitude & 88° 22' 142" E Longitude]
(4) *Atal Tea Estate* [±152 m amsl; 26° 40' 576" N Latitude & 88° 13' 082" E Longitude].
(5) *Kamalpur Tea Estate* [±154 m amsl; 26° 42.341' N Latitude & 88° 18.428' E Longitude].
(6) *Mohorgong & Gulma Tea Estate* [±154 m amsl; 26° 47.203' N Latitude & 88° 22.866' E Longitude], (7) *Makaibari Tea Estate* [± 1100 m amsl; 26° 62' 59" N Latitude & 88° 16' 43" E Longitude], (8) *Soom Tea Estate* [± 1200 m amsl; 27° 04 590' N Latitude & 88° 13 723 E Longitude] and (9)*Tamsong Tea Estate* [±1300 m amsl; 27°02.318' N Latitude & 088°09.992 E Longitude]. A GPS (GARMIN 12CX) was used to determine the location of these gardens. The work was done during 2002 – 2004.

Materials and methods

During the present survey, wide range of ethnobotanical information was recorded from the resourceful persons with the help of local field guides, local herbal practitioners, vendors, priests, spiritual healers known as *Jhankri* (in general) and experienced senior rural folks of different ethnic communities in workers colonies and also from nearby villages. Also the local people of different age groups, sex and profession were interviewed following a prepared questionnaire. Most of the common people provided information on various types of uses of local plants like edible, fodder-producing, dye yielding, thatching, etc. herbal practices, on the other hand shared their knowledge on herbal drugs.

All the voucher specimens were spotted and collected by these people and were recorded in the field note book along with many other information like (i) vernacular name, (ii) useful part, (iii) purpose of use, (iv) other ingredients etc. All the collected specimens were processed and identified in the Taxonomy & Environmental Biology Laboratory of the Department of Botany, University of North Bengal and are preserved in the NBU-Herbarium. However, Jain (1981,

1987, 1991); Rai *et al* (1998); Rai & Bhujel (1999), Rai (2002) among others, were followed for overall methodology.

Results

As much as 86 species of pteridophytes has been recorded from the Tea Gardens under study (Ghosh 2006). Of these 25 species has been recorded to use by these people. The plants and their uses have been enumerated below:

Adiantum capillus-veneris L. [ADIANTACEAE]

Exiccatus: Makaibari TE, **AP Das & Chandrâ 1966**, dated 30.06. 2003

Used as medicine in pectoral demulcent and as expectorant and tonic. It is boiled in wine that is given in cases of hard tumours of the spleen, liver and other viscera.

Adiantum philippense L.; *Adiantum lunulatum* N. Burman [ADIANTACEAE]

Exiccatus: Tamsong TE, **AP Das & Chandrâ 2398**, dated 05.11. 2003.

Used in blood diseases, in epileptic fits and in rabies; rhizomes prescribed for strangery and in fever due to elephantiasis. Fronds are burnt in oil and used to pacify itching.

Angiopteris crassipes Wallich *ex* C. Presl; *Angiopteris evecta sensu auct. multi.* Beddome [MARATTIACEAE]

Exiccatus: Makaibari TE, **AP Das & Chandrâ 2821**, dated 23.02. 2004.

Massive short stem, full of starch, is edible and form the basis of an intoxicating drink. Leaves used as head dresses and temporary beds. Stem is reported to be very effective in curing white patches on skin.

Asplenium filix-femina var. ***parasnathensis*** Bernham [ASPLENIACEAE]

Exiccatus: Tamsong TE, **AP Das & Chandrâ 2431**, dated 05.11. 2003.

Anthelmintic, Diuretic, Poultice, female diseases; relieving labour pains; internal ailments such as cancer of the womb; general body pains; breast pains caused by childbirth and to induce milk flow in caked breasts; externally to heal sores; liquid root extract is an effective anthelmintic.

Blechnum orientale L.; *Asplenium orientale* (L.) Bernhardi [BLECHNACEAE]

Exiccatus: Kamalpur TE, **AP Das & Chandrâ 1183**, dated 18.10.2002.

Rhizome edible and also used in urinary disorders and as an anthelmintic; poultice applied to boils.

Ceratopteris thalictroides (L.) Brongniart; *Acrostichum thalictroides* L. [PARKERIACEAE]

Exiccatus: Hansqua TE, **AP Das & Chandrâ 1664**, dated 13.11. 2002.

Vegetative fronds are edible both as green salad and after cooking as potherb.

Dicranopteris linearis (N. Burman) Underw.; *Polypodium lineare* N. Burman [GLEICHENIACEAE]

Exiccatus: Tamsong TE, AP **Das & Chandrâ 2299**, dated 05.09. 2003.

Rhizomes anthelmintic; fronds used in asthma; rachis used for making mats, chairs, seats, pouches,

caps, fishing traps, baskets, belts etc. Fronds are ingredients for making local beverages.

Diplazium esculentum (Koenig *ex* Retzius) Swartz; *Hemionitis esculenta* Koenig ex Retzius [ATHYRIACEAE]

Exiccatus: Mohurgong & Gulma TE, **AP Das & Chandrâ 0009**, dated 27.01.2002; Makaibari TE, **AP Das & Chandrâ 1861**, dated 10.06. 2003.

Young unopened fronds eaten in salad or as cooked vegetable.

Dryopteris filix-mas (L.) Schott; *Polypodium filix-mas* L. [DRYOPTERIDACEAE]

Exiccatus: Hansqua TE, **AP Das & Chandrâ 1153**, dated 14.06.2002.

Young fronds cooked and eaten. Roots anodyne, antibacterial, anti-inflammatory, antiviral, astringent, febrifuge, vermifuge, worm-expellant; checking internal haemorrhage, uterine bleeding, mumps and feverish illnesses. Pregnant women and people with heart complaints should not consume this plant.

Equisetum diffusum D. Don [EQUISETACEAE]

Exiccatus: Tamsong TE, **AP Das & Chandrâ 2229**, dated 05.09. 2003; Soom TE, **AP Das & Chandrâ 3294**, dated 26.06. 2004.

Used as clotting agent in nose bleeding, wounds and coughing up of blood. Also used in bleeding urinary tract, cystitis and prostrate diseases due to its astringent property. It has cooling effect in gonorrhea.

Equisetum ramosissimum Desf. Subsp. ***debile*** (Roxburgh *ex* DC.) Hauke; *Equisetum debile* Roxburgh *ex* Vaucher [EQUISETACEAE]

Exiccatus: Mohurgong & Gulma TE, **AP Das & Chandrâ 0033**, dated 27.01.2002; Tamsong TE, **AP Das & Chandrâ 1944**, dated 30.04. 2003.

Used as refrigerant and given in gonorrhoea.

Hypolepis punctata (Thunberg) Mettenius *ex* Kuhn; *Polypodium punctatum* Thunberg [HYPOLEPIDACEAE]

Exiccatus: Makaibari TE, **AP Das & Chandrâ 2850**, dated 25.03. 2004.

Fronds used as poultice on boils.

Lycopodiella cernua (L.) Pichi-Sermolli; *Lycopodium cernuum* L. [LYCOPODIACEAE]

Exiccatus: Tamsong TE, **AP Das & Chandrâ 3014**, dated 10.04. 2004; Soom TE, **AP Das & Chandrâ 3459**, dated 12. 10. 2004; Mohurgong & Gulma TE, **AP Das & Chandrâ 1525**, dated 22.10. 2002.

Decoctions used in lotions in beriberi, cough and uneasiness in the chest; embrocation of ashes in vinegar recommended for skin eruption. Plants used for stuffing pillows after drying.

Lycopodium pseudoclavatum Ching; *Lycopodium clavatum auct non* L. [LYCOPODIACEAE]

Exiccatus: Soom TE, **AP Das & Chandrâ 3392**, dated 12. 10. 2004; Tamsong TE, **AP Das & Chandrâ 1956**, dated 30.04. 2003.

Spores are used as dusting powder for playing carom; used against wounds, cracks and fissures. The plants are formed a part of the ceremonial and religious decoration. It is also to stop haemorrhage after childbirth.

Lygodium japonicum (Thunberg) Swartz; *Ophioglossum japonicum* Thunberg [LYGODIACEAE]

Exiccatus: Tamsong TE, **AP Das & Chandrâ 2885**, dated 10.04. 2004; Hansqua TE, **AP Das & Chandrâ 1381**, dated 20.10.2002.

Used as expectorant, decoction of fertile fronds as diuretic and cathartic.

Lygodium microphyllum (Cavan) R. Brown; *Ugena microphyllum* Cavan [LYGODIACEAE]

Exiccatus: Mohurgong & Gulma TE, **AP Das & Chandrâ 0975**, dated 04.05. 2002; Hansqua TE, **AP Das & Chandrâ 0254**, dated 09.02.2002.

Young leaves eaten; used as poultice in skin diseases, swellings; decoction used in dysentery; old rachis for basket making and plaiting.

Lygodium salicifolium C. Presl; *Lygodium flexuosum sensu* Beddome [LYGODIACEAE]

Exiccatus: Mohurgong & Gulma TE, **AP Das & Chandrâ 0014**, dated 27.01.2002; Hansqua TE, **AP Das & Chandrâ 0172**, dated 03.02.2002; Tamsong TE, **AP Das & Chandrâ 2134**, dated 30.04. 2003.

Used as expectorant, fresh roots applied externally against rheumatism, sprain, scabies, eczema, wounds and particularly for carbuncles.

Marsilea quadrifolia L. *Marsilea crenata* Presl. [MARSILEACEAE]

Exiccatus: Kamalpur TE, **AP Das & Chandrâ 0457**, dated 17.04.2002.

Leaves eaten as vegetable. Also, used against insomnia.

Nephrolepis auriculata (L.) Trimen; *Polypodium auriculatum* L., *Nephrolepis cordifolia sensu auct. pl., non* (L.) Presl [NEPHROLEPIDACEAE]

Exiccatus: Makaibari TE, **AP Das & Chandrâ 2473**, dated 11.11. 2003.

Root-tubers are edible and taken as remedy of jaundice; decoction of the freshly collected fronds given in cough; fronds used in decoration.

Odontosoria chinensis (L.) J. Smith; *Trichomanes chinense* L. [LINDSAEACEAE]

Exiccatus: Soom TE, **AP Das & Chandrâ 3596**, dated 12. 10. 2004.

Prescribed in chronic enteritis.

Onychium siliculosum (Desvaux) C. Christensen; *Pteris siliculosa* Desvaux [TAENITIDACEAE]

Exiccatus: *Golden Fern*

Decoction of the fronds used in dysentery.

Pityrogramma calomelanos (L.) Link; *Acrostichum calomelanos* L. [HEMIONITIDACEAE]

Common Name: *Silver Fern*

Exiccatus: Soom TE, **AP Das & Chandrâ 3100**, dated 03.05. 2004

Constituent of a decoction used in kidney troubles. Rhizomes used as an anthelmintic and leaf smoked for colds in head and chest.

Pteridium aquilinum (L.) Kuhn subsp. ***aquilinum*** var. ***wightianum*** (J. Agardh) Tryon [PTERIDIACEAE]

Exiccatus: Mohurgong & Gulma TE, **AP Das & Chandrâ 0317**, dated 16.02. 2002; Tamsong TE, **AP Das & Chandrâ 2255**, dated 05.09. 2003.

Boiled rhizomes eaten during scarcity, or grounded into flour for making bread. Rhizomes used for brewing local beer. Young fronds used as vegetables, as soup, fodder and dried fronds as packing material. Rhizome astringent and anthelmintic; proves fatal when consumed more and solely.

Selaginella bisulcata Spring [SELAGINELLACEAE]

Common Name: *Spike Moss*

Exiccatus: Soom TE, **AP Das & Chandrâ 2640**, dated 27.12. 2003.

Used for decoration. Uprooted plants are sold in Indian markets as resurrection plant and as ornamental. It is reputed as '*Sanjeevani*' and is sold during summer as cooling agent.

Tectaria coadunata (J. Smith) C. Christensen [TECTARIACEAE]

Exiccatus: Soom TE, **AP Das & Chandrâ 3204**, dated 26.06. 2004; Tamsong TE, **AP Das & Chandrâ 2167**, dated 30.06. 2003.

Used against acute cases of diarrhoea in children and other stomach troubles and eaten as salad.

Discussion

Recorded 25 species of pteridophytes with ethnic use are coming under 21 genera and 20 families. Of these only three families (Equisitaceae, Lycopodiaceae and Selaginellaceae) are not ferns. These three families are represented by four genera and five species. Except Lycopodiaceae (*Lycopodiella* and *Lycopodium*) all other families are represented by one genus only. Among the genera *Lygodium* is represented with three species and two other genera, *Adiantum* and *Equisetum* are represented with two species. All the remaining 22 genera are represented with one species only.

At least ten of these 25 pteridophytes are edible in different form.Young fronds of *Diplazium esculentum* and *Tectaria coadunata* are marketed in huge quantity. In addition, two plants are used for the production or fermenting of local traditional liquor. On the other hand only one plant is used as fodder. However, a much larger number of 22 plants are recorded to have medicinal uses. An wide range of diseases and/or symptoms are treated with these plants and covers diseases like rabbis, elephantiasis, many female diseases, cancer in womb, gonorrhoea, mumps, beriberi, dysentery, carbuncle, insomnia, kidney trouble etc. In addition some plants are also used as anthelmintic, antibiotic, antiviral, expectorant, vermifuge, analgesic etc. However, tribal tea garden workers suggested that *Pteridium aquilinium* should not be consumed for a long period and should not be eaten by pregnant women as it may produce lethal effects.

While *Lycopodiella cernua* is used for stuffing pillow, *Lycopodium pseudoclavatum* spores are used for playing carom.Two species, *Dicranopteris linearis* and *Lygodium microphyllum* are used for basketry and similar other works. *Dicranopteris linearis* is also used for making fishing-traps.

Nephrolepis auriculata and *Selaginella bisulcata* are used as ornamental and plants like *Lycopodium pseudoclavatum* used as ceremonial and religious decoration. And, *Selaginella bisulcata* is used as a coolant.

Now it can be conclude that over 30% pteridophytic tea garden weeds are useful for the society as a considerably large population is using those plants for over a hundred years of their settlement in the tea garden areas of Darjiling and Terai.

References

Al Corn JB.1995. The Scope and Aims of Ethnobotany in developing world. In *Ethnobotany: Evolution of Discipline* (Shultes RE, Reis SV, Eds.). Dioscorides Press, Portland, Oregon. pp. 23 - 39

Cotton, CM. 1996. *Ethnobotany: Principles and Applications*. John Wiley & Sons, New York.

Das AP. 2004. Floristic studies in Darjiling hills. *Bull Bot Surv India* 43: 1-18

Dutta AC. 1983. Some common weeds of the Tea states in North-East India. Tea Research Association, Tocklai Experimental Station, Jorhat, Assam.

Ghosh C. 2006. Biology of Tea Garden Weeds in Darjeeling District of West Bengal (India). Ph.D. Thesis, University of North Bengal.

Ghosh C., Das AP. 2004. The materials and method of Jhârâ preparation by the tribal inhabitants of Tea Gardens in Terai of West Bengal (India). *Indian J Trad Knowledge* 3: 373-382

Haridas P, Sharma VS. 1972. Some common weeds of South Indian Tea Fields, UPASI Tea Research Station, Cinchona, S. India.

Haridas, P. & Venkataramani, K.S.1972. Some common weeds of South Indian Tea Fields. UPASI Tea Research Station, Cinchona, S. India.

Harikrishnan B. 1978. Some common weeds of South Indian Tea Fields, UPASI Tea Research Station, Cinchona, S. India.

Jain SK. 1981. Glimses of Indian Ethnobotany. Oxford and IBH. New Delhi.

Jain SK. 1987. A manual of Ethnobotany. Scientific Publishers, Jodhpur

Jain SK.1991. Dictionary of Indian Folk Medicine and Ethnobotany. Deep Publications, New Delhi.

Mustafee TP. 1972. Survey of weed flora in tea of North-Eastern India and control of weeds in tea by MSMA herbicide- mixture. Technical Report, FCL, Bombay.

Mustafee TP. 1981. Unseen losses due to weeds and diseases: A Review. *Pesticides* Information January – March.pp. 2 - 6

Mustafee TP. 1988. Problem weeds and their control in tea. *Pesticides* pp. 46 - 49

Mustafee TP. 1998. Integrated approach towards efficient Weed management in Tea *Camellia sinensis* (L.) O.Kuntze. The Assam Review and Tea News. Feb, 1998. pp. 6 -12

Mustafee TP. 1998. Integrated Approach Towards Efficient Weed management in Tea *Camellia sinensis* (L.) O. Kuntze, The Assam Review and Tea News, July.

Pushpangadan P. 2002. The role of ethnobotany in 21st century. In *Perspectives of Plant Biodiversity* (Das AP, Ed.). Bishen Singh Mahendra Pal Singh, Dehradun. pp. 613 – 619.

Rai PC, Sarkar A, Bhujel RB, Das AP. 1998. Ethnobotanical studies in some fringe areas of Sikkim and Darjeeling Himalayas. *J Hill Res* 11: 12-21

Rai SK, Bhujej RB.1999. Note on some less known ethnomedicinal plants from the Darjeeling Himalayas. *J Hill Res*12: 160-163

Rai SK. 2002. *Studies on the Ethnobotany of Darjeeling Himalaya*. Ph.D. thesis, University of North Bengal, India.

Ramachandran K. 1978. Some common weeds of South Indian Tea Fields, UPASI Tea Research Station, Cinchona, S. India.