

Chapter 5

UTILIZATION OF FERN AND FERN- ALLIES

5.Introduction

Biological resource has been utilized by mankind from time immemorial and yet that trend is still followed in 21st century too. The developing nation and under developed nation still has majority of population residing in rural areas in accessible to the modern facilities. The story of India and about its marginalized rural population directly or indirectly depends upon forest resources in day to day life. Considering Darjiling hills as a study area comprising of three sub-division namely, Darjiling, Kuresong and Kalimpong having in accessible terrain complexity and lack of modern facility where people still rely directly on forest for different needs. In day to day life people from villages depend directly on forest resources for maintaining their needs like food, fodder, medicine and household article. The region comprising an area of 2417km² has eight hospitals and 24 public health centers with doctor to people ratio of 1:4892. Health issues for down turn people in term of modern medicine are in accessible and they directly depend upon plants collected from their surroundings.

Darjiling hills has three important ethnic communities i.e Bhutia, Lepchas and Nepalese and each group following their own traditional way of utilizing natural resources. However with the turn in time the traditional utilization of plants by this different group is known to all and the knowledge has been amalgamated and passed from one generation to another. Therefore the marginalized population of far flung area utilizes the natural resource which has been passed by their fore fathers. In the present study an attempt has been made to document the utilization of fern and fern allies by the people of Darjiling hills.

5.1 Utilization of Fern and Fern allies

The forest is a reservoir of natural resources comprising of different groups of plants and animals. Past study through data mining and review revealed

that the utilization of plants revolved around the angiosperms (Yonzon *et al.* 1984; Rai and Sharma, 1994; Rai and Bhujel, 1999; Das and Mandal, 2003). However an attempt was made where 281 species were documented as ethno-medicine where 9 species belong to fern and fern allies (Chettri *et al.* 2003). Similarly 265 species belonging to 220 genera and 120 families were documented as ethno-medicine where on 3 species of ferns were reported from Darjiling District (Yonzon *et al.* 2011). The present study was carried out in villages in the form of questionnaires which were made under different sections representing ethno medicine, fodder, ornamentals and vegetables. The village elders and the healers were questioned and their answers were documented. The questionnaires have been provided in Table 5.1.

Table 5.1: Questionnaires For utilization of ferns in Darjiling hills.

Sl. no	Questionnaires for fern as non –timber forest Product	Local names
1.	Name some edible fern?	Sawuna ningro, lekh ningro
2.	Name some medicinal fern?	Rani sinka, Pira uniyew,
3.	Name some fern utilized as antiseptic?	Kali ningro
4.	Name some ferns used for preparing yeast cake?	Pira uniyew
5.	Name some ornamental ferns?	Nagbelli
6.	Name some ferns used as fodder?	Sottar uniyew
7.	Name some ferns used to make pot?	Rukh uniyew
8.	Name some ferns used for decoration?	Nagbeli, amala
9.	Name some ferns utilized for animal shed?	Rukh uniyew
10	Name some ferns utilized in religious ceremony?	Nagbelli



Plate 5.1: A. *Cyathea spinulosa* Wallich ex Hooker (croizer); B. *Deparia boryana* (Willdenow.)M.Kato croizer; C. *Tectaria fuscipes* (Wallich ex Beddome) C. Christensen; D. *Huperzia squarosa* (Forster)Trevisan; E. *Davallia fijiensis*; F. *Cyathea brunoniana* C.B Clarke trunks utilized for making pot; G. *Huperzia pulchermia*(Wallich ex Hooker et Greville)Pich.Sermolli;H. *Pteridium revolutum* (Blume)Nakai; I. *Thelypteris procera*(D.Don)Fraser-Jenkins.

5.2 Result

The study revealed rich traditional knowledge of ethnic people of Darjiling hills, natural resources from the surrounding area was utilized for day to day purposes (Plate5.1). In this survey, it was found that 40 species of fern and fern allies are used by people for different purposes and they have been categorized as Medicinal fern, Edible ferns, Cattle bed ferns and ornamental ferns. It was found that eleven species were used as medicinal ferns and young crozier of sixteen species was utilized as vegetable which fall under the category of edible fern from the genus *Diplazium*, *Deparia* and *Cyathea*. Four species of ferns were utilized as cattle bed fern (Sottar) for domesticated animals and nine species of fern were used for ornamental and decorative purposes.

Table 5.2 Cattle bed Fern (CBF) of Darjiling hills

Sl. No.	Scientific Name	Local Name	Family	Uses
1	<i>Dicranopteris lanigera</i> (Don)Fraser-Jenkins	Sottar	Gleicheniaceae	Cattle bed ferns.
2	<i>Dicranopteris taiwanseis</i> Ching & Chui	Sottar	Gleicheniaceae	Cattle bed ferns
3	<i>Diploterygium giganteum</i> Wallich ex Hooker & Bauer	Sottar	Gleicheniaceae	Used to cover the sowed zinger rhizome and used as cattle bed ferns too.
4.	<i>Pteridium revolutum</i> (Blume) Nakai	Sottarey uniyo	Dennstaedtiaceae	Cattle bed ferns

Table 5.3: Edible Fern (EF) of Darjiling hills.

Sl. no	Scientific name	Local name	Family	Uses
1	<i>Angiopteris helferiana</i>	Gaikhurey uniyo	Maratiaceae	Rhizomes edible

2	<i>Cythea brunoniana</i> C.B Clarke	Rukh uniyew	Cyatheaceae	Young croizer edible
3	<i>Deparia boryana</i> (Willdenow) Kato	Ghew ningro	Woodsiaceae	Young fronds edible
4	<i>Diplazium esculentum</i> (Retzius) Swartz	Auley Chipley ningro	Woodsiaceae	Young fronds edible
5	<i>Diplazium forrestii</i> (Ching ex Z. R. Wang) Fraser-Jenkins	Lekh chipley ningro	Woodsiaceae	Young fronds edible
6	<i>Diplazium himalayensis</i> (Ching) Panigrahi	Danthey ningro	Woodsiaceae	Young fronds edible
7	<i>Diplazium javanicum</i> (Blume) Makino	Sano Chipley ningro	Woodsiaceae	Young fronds edible
8	<i>Diplazium kawakamii</i> (Ching ex Z. R. Wang) Fraser- Jenkins	Jire ningro	Woodsiaceae	Young fronds edible
9	<i>Diplazium maximum</i> (D.Don)C.Christensen	Sawney ningro	Woodsiaceae	Young fronds edible
10	<i>Diplazium sikkimensis</i> (Clarke) Christensen	Sawaney ningro	Woodsiaceae	Young fronds edible
11	<i>Diplazium spectabile</i> (Wallich ex Mettenius) Ching	Kalo ningro	Woodsiaceae	Young fronds edible
12	<i>Diplazium succulentum</i> (Clarke) Christensen	Lekh Chipley ningro	Woodsiaceae	Young fronds edible
13	<i>Diplazium stoliczkae</i> Beddome	Lekh Chipley ningro	Woodsiaceae	Young fronds edible
14	<i>Lygodium japonicum</i> (Thunberg in Murray) Swartz	Pari anra	Lygodiaceae	Young frond edible.
15	<i>Ophioglossum</i>	Jibra sag	Ophioglossaceae	Fronds ediible

	<i>reticulatum</i> Linnaeus			
16	<i>Tectaria fuscipes</i> (Wallich ex Beddome) Christensen	Rato lekh ningro	Dryopterideaceae	Young fronds edible

Table 5.4: Medicinal Fern (MF) of Darjiling hills

Sl. no	Scientific name	Local name	family	Medicinal uses
1.	<i>Adiantum philippense</i> Linnaeus subsp. <i>philiphense</i> Fraser-Jenkins	Simsary uniyo	Adiantaceae	Paste used in cut and wounds
2.	<i>Adiantum venustum</i> Don	Rani sinka	Adiantaceae	Stipe used as antibiotic and antiseptic sticks in pierced nose and ear.
3	<i>Aleuritopteris bicolor</i> (Roxburgh)Fraser-Jenkins	Rani sinka	Pterideaceae	Stipe used as antibiotic and antiseptic sticks in pierced nose and ear.
4	<i>Equisetum arvense</i> Linnaeus subsp. <i>diffusum</i> Fraser-Jenkins	Salli-bisalli	Equisetaceae	Used against dog bites
5	<i>Lygodium japonicum</i> Thunberg	Parayo-Anri	lygodiaceae	Used against fever and cough.
6	<i>Nephrolepis cordifolia</i> (Linnaeus)C.Presl	Pani amala	Oleandraceae	It is used against chest congestion.
7	<i>Pteris biaurita</i> Linnaeus subsp. <i>fornicata</i> Fraser-	Thara uniyo	Pterideaceae	Used as antibiotic against

	Jenkins			pneumonia
8	<i>Pteris spinescens</i> Presl	Thara uniyow	Pterideaceae	Used as antiseptic as well as for blood coagulation
9.	<i>Tectaria coadunata</i> (J.Smith)C. Christensen	Aula kalo ningro	Dryopterideacea e	Rhizome used in diarrhea and pneumonia
10	<i>Thelypteris cana</i> (Baker)Ching	Pirey sottar	Thelypteridaceae	To eradicate bed bugs and lice of fowl
11	<i>Thelypteris procera</i> (Don) Fraser-Jenkins	Pirey sottar	Thelypterideacea e	Leaves used for preparation of yeast cake.

Table 5.5 : Ornamental Ferns (OF) of Darjiling hills.

Sl. no.	Scientific Name	Local Name	Family	Uses
1	<i>Cyathea brunoniana</i> Clarke	Rukh uniyew	Cyatheaceae	Pot made up of the trunk for orchid cultivation.
2	<i>Cyathea spinulosa</i> Wallich ex Hooker	Rukh uniyew	Cyatheaceae	Ornamnetal & its trunk are used for orchid cultivation.
3	<i>Davillia fejenis</i>	Rabit foot	Daviaceae	ornamental
4.	<i>Huperzia pulchermia</i> (Wall ich ex Hooker & Greville) Pich. Sermolli	Lycopodiaceae	Ornamental.
5.	<i>Huperzia squarrosa</i> (Froste r) Trevisan	lycopodiaceae	Ornamental

6.	<i>Lycopodiella cernua</i> (Linnaeus)Pich.S ermolli	Nagbeli	Lycopodiaceae	Used for decoration.
7.	<i>Lycopodium japonicum</i> Thunberg	Nagbeli	Lycopodiaceae	Utilized in decoration of Pandals as well in religious ceremony specially Saraswati puja.
8.	<i>Nephrolepis cordifolia</i> (Linnaeus)Presl	Pani amala	Oleandraceae	Ornamental, used for decoration.
9.	<i>Selaginella pulvinata</i> (Hooker et Greville) Maxim.	Kur kura jhar	Selaginaceae	Used for decoration purposes.

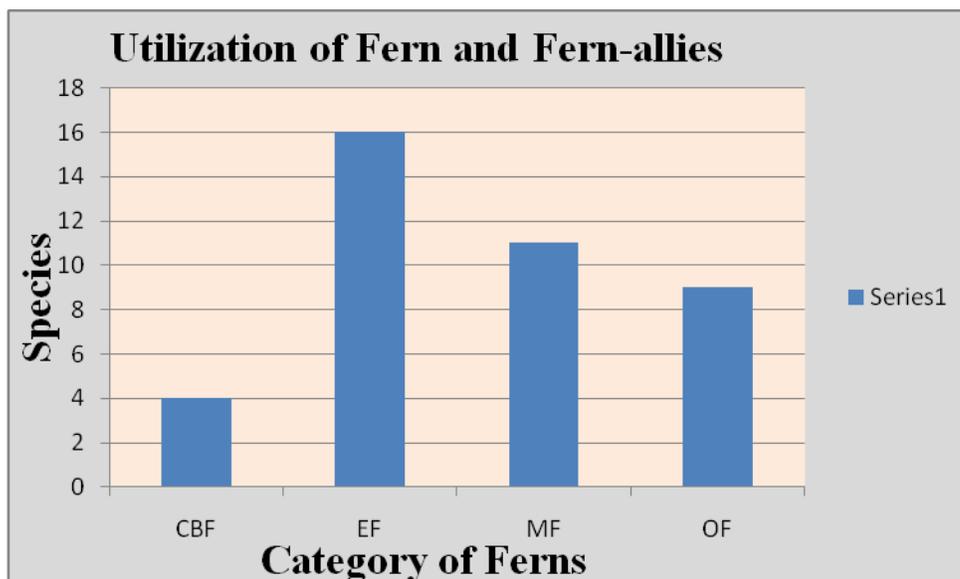


Figure 5.1: Utilization of Pteridophyte in Darjiling hills (CBF: Cattle bed ferns; Ef: Edible ferns; MF: Medicinal ferns; OF: Ornamental ferns)

5.3 Discussion

Utilization of biological resources by mankind is immemorial and we directly depend upon forest for fulfillment of our needs. The needs vary from person to person and in this study the need of Pteridophytes by rural people were investigated. The result shows 40 species of ferns utilized for different purposes which may be ethno-medicine, Cattle bed ferns, Edible Fern and ornamental fern. The documentation of utilization from this region for this group in such a large extent is for the first time. In the past some documentation of utilization of pteridophytes revealed 9 species (Chettri *et al.* 2003), 3 species (Yonzon *et al.* 2011). Kholia 2010 studied the utilization of Pteridophytes from the state of Sikkim and recorded 34 species. Rest of the literature on utilization focused on angiosperm (Rai and Sharma, 1994; Rai and Bhujel, 1999; Das and Mandal 2003; Rai, 2006). The overexploitation of the species is of great concern as some species are collected for foliage as well as for tubers. *Neprolepis cordifolia* (Linnaeus) C. Presl is overexploited as foliage is used for decoration and tubers for ethno-medicine. The collection is such huge that the humus content of its habitat has dwindled rapidly leading to decrease in the water holding capacity of the soil. An instance of *Huperzia phelegmeria* which had a sizeable population couldn't be collected in the present study due to the over exploitation of the species for ornamental purposes. Management measures and conservation strategy should be formulated in order to check the over exploitation of species. The craziness about young crozier (Ningro) is such that the villagers collect rampantly without knowing the species is edible yet they sell them in a local market as it is the easiest way to earn their livelihood.

5.4 Conclusion

In the study 40 Pteridophytes were found to be used by local people for different purposes. Young fronds are used as vegetable and preferred as delicacy. In some cases over exploitation of species were observed which has led to gradual decline in the population of a species and in certain extent some species tend to be rare in the study area. Proper conservation strategy and management is required to safe guard species like *Cyathea*

spinulosa Wallich ex Hooker, *Angiopteris helferiana* Presl etc. that has become rarest in the region.

5.5 Summary

A study was undertaken in Darjiling District comprising of three hill sub-division namely Darjeeling, Kalimpong, Kurseong excluding duars and siliguri to document the utilization of fern and fern allies. The area is inhabited by three communities i.e. Bhutia, Lepcha, Nepali and each community has their own traditional way to utilize the natural resources. Numerous field trips in the forest village, local market (Hatt) were undertaken with questionnaires prepared to interview the village head and local healers. The answer to the questionnaires and photographs were taken which revealed darjiling hills has rich traditional knowledge where people utilize Fern and fern-allies from the surrounding area for day to day purposes. In this survey, it was found that 40 species of fern and fern allies are used by people for different purposes and they have been categorized as Medicinal fern, Edible ferns, Cattle bed ferns and ornamental ferns. It was found that eleven species were used as medicinal ferns and young crozier of sixteen species was utilized as vegetable which fall under the category of edible fern from the genus *Diplazium*, *Deparia* and *Cyathea*. Four species of ferns were utilized as cattle bed fern (Sottar) for domesticated animals and nine species of fern were used for ornamental and decorative purposes.