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Diversity of pteridophyte flora in Akamala forest station, Thrissur, Kerala

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Abstract

Akamala forest station belongs to Machad forest range in Thrissur district. No literature is available regarding the diversity of flora and fauna of this forest range. The current study focuses on the diversity of pteridophytes in the Attoor beat of Akamala forest station. The survey has been carried out from June 2015 to August 2016. A total of 24 species of pteridophytes were collected from the study area. Floristic analysis of collected specimens was carried out to find out the families, genus and species. The collected species belonged to 17 genera, 14 families and 2 classes. Except different species of *Selaginella* ((Lycopside) all other members belonged to the class Filicopsida (Fern group). The most frequently represented species were *Selaginella*, *Adiantum*, *Hemionitis* and *Pteris*. Most of the collected species were terrestrial. Epiphytes, lithophytes and aquatic species were also reported, but few in numbers. Regarding the conservation status, 2 species belonged to 'endangered' category, 4 species under the category 'rare' and 1 species 'at risk'. The result of the study indicates the richness of pteridophyte diversity in the study area.

Keywords: Pteridophyte, diversity, Akamala, Attoor beat

1. Introduction

Pteridophytes are the seedless vascular cryptogams which occupy a crucial central position in the evolutionary history of plant kingdom between the lower non-seed bearing and higher seed bearing plants. In India, pteridophytes constitute an important component of flora next to angiosperms (Chandra *et al.*, 2008) ^[1]. Jain and Sastry (1980) ^[2] reported 17 rare and endangered species of pteridophytes from India. They form a much neglected group of plants as far as their economic utilities are concerned.

Akamala forest station comes under Machaad forest range, a part of Thrissur forest division situated in Wadakkanchery, Thrissur Dist., Kerala. The Machaad range is divided into three forest stations *viz.* Akamala Forest Station, Elanad Station and Vazhani Station. This is an evergreen and semi-deciduous forest and covers an area of 42.349 sq. Km. The study was mainly done in the Bharanipachamala Reserve which extends from Akamala to Thonurkara villages in the Thrissur district with an altitude of below 498.688 ft. and comes under the Aattor beat of Machaad range. No biodiversity studies were conducted in this forest range as per the available literature. Being the tropical zone, heavy annual rainfall, high humidity and more or less warm and uniform day temperature throughout the year are the general features. The seasonal variations include rainy season from June to September, retreating monsoon from October to November, dry weather from December to February, hot summer from March to May. Relative humidity is high throughout the year and this combined with high temperature, presents a typical tropical humid climate throughout the year. The current project was undertaken with an intention to analyze and enumerate the pteridophyte flora in the Attoor beat of Akamala forest station for general awareness and conservation purposes.

2. Materials and Methods

The floristic study was based on repeated collections of all available pteridophyte specimens from the study area consisting of 24 sq.km. The study was conducted from June 2015 to August 2016, which included pre-monsoon, monsoon and post-monsoon visits. Field notes and habitat of each species were recorded and the photographs were taken during the field trip. Identification of the collected species was done with the help of descriptions given in the standard flora by Manickam and Irudayaraj (1992) ^[6] and was confirmed by the experts in the field.

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Labelled drawings of all the specimens with emphasis on their sporophylls were made for their easy identification. Taxonomic status of each species was assigned on the basis of classification by Pichi – Sermolli (1977) [8].

Conservation status of each species was determined with reference to the IUCN data and the check list proposed by Maridass and Raju (2010) [7]. Economic importance of different members was assessed with the help of available information from various sources. Herbarium of collected species was made and kept at Department of Botany, St. Mary's College, Thrissur.

3. Results and Discussion

24 species of Pteridophytes were collected from the study area and was classified according to Pichi-Sermolli's classification proposed in 1977. The collected species belonged to 17 genera, 14 families and 2 classes. Except different species of *Selaginella* (Lycopsidea) all other members belonged to the class Filicopsida (Fern group). Three families contained the 2 genus each. The most frequently represented species were *Selaginella*, *Adiantum*, *Hemionitis* and *Pteris*. Most of the collected species were terrestrial. Epiphytes, lithophytes and aquatic species were also reported, but few in numbers (fig.1). Regarding the conservation status, 2 species belonged to 'endangered' category, 4 species under the category 'rare' and 1 species 'at risk'. The list of 24 species of pteridophytes with their families, habitat and conservation status is given in Table 1.

Various systems of medicine like Ayurveda referred by Sushruta (100AD) and Charaka (100AD) in Samhitas, Unani system and Chinese system recommend the medicinal use of some ferns. Out of 24 collected species from the study area, 13 were medicinally important, and all the members were ornamentally important. Medicinally important pteridophytes and their medicinal values are listed in table 2.

Several studies have conducted on the fern diversity of different regions in India and worldwide from time to time. Madhusoodanan (1991)^[4] listed rare and endangered ferns of the Western Ghats and subsequently Manickam (1995)^[5] reported 44 rare and endangered species in the Western Ghats region of South India. A recent review on fern diversity of Western Ghats by Maridass and Raju (2010)^[7] recorded Thelypteridaceae as the largest family in the region with 16 genus and 25 species.

The pteridophytes are moisture and shade loving plants that dependent upon the microclimatic conditions of the region for their successful survival. Any kind of disturbance in these microclimatic conditions can hinder the growth and evolutionary processes occurring naturally in these plants thereby, leading to decline in their populations. Thus, factors like climate change, increasing urbanization, industrialization, encroachment of forest lands, unplanned developmental activities, over exploitation of natural resources, pose a major threat to the survival of these groups. Hence necessary measures have to be taken for the protection and conservation of this highly vulnerable plant group.

Table 1: Diversity of pteridophyte flora in Attoor beat of Akamala forest station and their conservation status

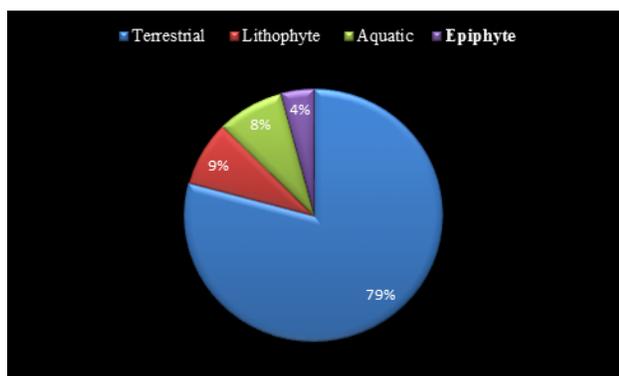
S. No	Family name	No. of species	Name of species	Habitat	Conservation status
1	Selaginellaceae	3	<i>Selaginella delicatula</i>	T	LC
			<i>Selaginella brachystachya</i>	T	C
			<i>Selaginella crassipes</i>	T	R
2	Ophioglossaceae	1	<i>Ophioglossum costatum</i>	L	EN
3	Schizaceae	1	<i>Lygodium flexuosum</i>	T	C
4	Pteridaceae	4	<i>Pteris vittata</i>	T	C
			<i>Pteris confusa</i>	T	LC
			<i>Pteris praetermissa</i>	T	C
			<i>Pteris pellucida</i>	T	C
5	Sinopteridaceae	1	<i>Cheilanthes tenuifolia</i>	T	C
6	Parkeriaceae	1	<i>Ceratopteris thalictroides</i>	A	C
7	Hemionitidaceae	2	<i>Hemionitis cordata</i>	T	C
			<i>Pityrogramma calamelanos</i>	T	C
8	Adiantaceae	3	<i>Adiantum philippense</i>	T	C
			<i>Adiantum caudatum</i>	T	R
			<i>Adiantum latifolium</i>	T	R
9	Oleandraceae	1	<i>Nephrolepis auriculata</i>	T	C
11	Thelypteridaceae	2	<i>Cyclosorus interruptus</i>	T	EN
			<i>Christella dentata</i>	T	C
13	Athyriaceae	2	<i>Anisocampium cumingianum</i>	T	ATR
			<i>Athyrium hohenackeranum</i>	T	C
14	Lomariopsidaceae	1	<i>Bolbitis subcrenata</i>	L	
15	Polypodiaceae	2	<i>Drynaria quercifolia</i>	E	C
16	Marsileaceae	1	<i>Marsilea minuta</i>	A	C

*T-terrestrial, L-lithophyte, E-epiphyte, A-aquatic

**C-common, EN-endangered, T-threatened, R-rare, ATR-at risk, NA-not assessed, LC-least Concerned

Table 2: List of medicinally important pteridophytes and their uses

S. No	Name of species	Plant parts	Uses
1.	<i>Selaginella delicatula</i>	Whole plant	Antibacterial, used for wound healing
2.	<i>Lygodium flexuosum</i>	Whole plant, Rhizome	Plant as expectorant, rhizome in rheumatism, scabies, ulcers, piles
3.	<i>Pteris pellucida</i>	Leaf	Early maturation of boils
4.	<i>Pteris vittata</i>	Whole plant	Herb juice for diarrhoea and dysentery
5.	<i>Cheilanthes tenuifolia</i>	Rhizome and root extract	General tonic
6.	<i>Ceratopteris thalictroides</i>	Fronds and leaf extract	Healing of wounds
7.	<i>Hemionitis cordata</i>	Leaves	in aches and as vermifuge, in burns
8.	<i>Pityrogramma calomelanos</i>	Plant decoction	Renal disorders, fever, tension, and cough. Rhizomes- anthelmintic.
9.	<i>Adiantum philippense</i>	Rhizome, Fronds	Rhizome-glandular swelling Leaf juice- dysentery, ulcers, burning sensation, indigestion
10.	<i>Adiantum caudatum</i>	Fronds	Used in healing
11.	<i>Nephrolepis auriculata</i>	Leaves	Decoction used in cough
12.	<i>Drynaria quercifolia</i>	Rhizome, Fronds	Hectic fever, dyspepsia and cough
13.	<i>Marsilea minuta</i>	Whole plant	Cough, spastic condition of leg and muscles

**Fig 1:** Ecological classification of collected species

4. Conclusion

The results of the present investigation reveal that Attoor beat of Akamala forest station is rich in pteridophyte diversity, though they do not form an important component of the vegetation in the area. Due to unplanned felling of trees in the forests the members of epiphytic pteridophytes belonging to the families Polypodiaceae, Davalliaceae, Aspleniaceae, Vittariaceae, have been reduced day-by-day. Large scale collection of ferns from the forests by the visitors and local people for ornamental purpose, medicinal purpose and during excursions also increases the pressure on these plants. Biodiversity conservation is the need of time and hence it has become imperative to develop *in-situ* and *ex-situ* conservation methods for the conservation of existing pteridophyte diversity in the area. Focus should be given to *in situ* conservation methods as it allows the evolution of the species to continue within the area of natural occurrence thereby increasing its further diversity.

5. References

- Chandra S, Fraser-Jenkins CR, Alka Kumari, Archana Srivastava. A summary of the states of threatened pteridophytes of India. *Taiwania*. 2008; 2:1145-156.
- Jain SK, Sastry ARK. Threatened plants of India: A state-of-the-art Report, New Delhi, India, 1980.
- Kimura K, Noro Y. Pharmacognostical studies on Chinese drug Gu-sui-bu. I. consideration on gu-sui-bu in old herbals Pharmacognostical studies on fern drugs XI. *Syoy-akugaku Zasshi*. 1965, 1925-31.
- Madhusoodanan PV. Rare and endangered ferns and fern-allies of Western Ghats of Kerala. In: Karunakaran, CK. (ed.), Proceedings of the Symposium on Rare,

Endangered, and Endemic Plants of the Western Ghats. Thiruvananthapuram, India. 1991, 103-107.

- Manickam VS. Rare and endangered ferns of the Western Ghats of South India. *Fern Gaz*. 1995, 151-10.
- Manickam VS, Irudayaraj V. Pteridophytes flora of the Western Ghats-South India, BI Publications, New Delhi, 1992.
- Maridass M, Raju G. Conservation status of Pteridophytes, Western Ghats, South India. *IJBT*. 2010, 42-57.
- Pichi Sermolli REG. Tentamen pteridophytorum genera in taxonigicum ordinem redigendi. *Webbia*. 1977; 31:2313-512.
- Uddin MG, Mirza MM, Pasha MK. The medicinal uses of pteridophytes of Bangladesh. *Bangladesh J Plant Taxon*. 1998; 5(2):29-41.