



**PTERIDOPHYTE FLORA OF DR. SALIM ALI BIRDS
SANCTUARY, THATTEKAD, ERNAKULAM, KERALA - A
PRELIMINARY STUDY**

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Abstract:

Dr. Salim Ali Bird Sanctuary, Thattekad is one of the biodiversity rich areas of flora and fauna with many endemic and RET species. This study revealed that in this sanctuary there is the presence of 30 species belonging to 23 genus and 18 pteridophytes families. Pteridophytes are spore bearing and non flowering plants. *Asplenium polydon* G. Forst., *Blechnum orientale* Linn., *Lindsaea ensifolia* Sw. , *Microlepia speluncae* (Linn) Moore (Hook) Sledge, *Microsorium nigrescens* (BI) Cospel., *Microsorium pteropus* (BI.) Nayar, and *Selaginella delicatula* (Desv. ex Poir.) Alston. are seven endemic species of pteridophytes in Dr. Salim Ali Bird Sanctuary. The family wise taxonomic occurrence ratio is 14: 11: 7: 4. The pteridophytes form a vital component of the ecosystem and most of them being forest dwellers in Bird Sanctuary. More studies are essential for developing in situ or ex situ conservation strategies for this prime and magnificent group of plants.

Key Words: Dr. Salim Ali Bird Sanctuary, Pteridaceae & Endemic

Introduction:

Pteridophytes are vascular cryptogams. Devonian, Mississippian and Pennsylvanian periods of the late Paleozoic are considered as the 'Age of Pteridophyta'. The land plants have complex internal organization and pteridophytes occupy an intermediate position between bryophytes and higher land plants (gymnosperms and angiosperms). The pteridophytes resemble bryophytes and higher land plants (gymnosperms and angiosperms). The pteridophytes resemble bryophytes, in having similar events and requirements of life cycle. The sexual generation-gametophyte-of bryophyte and pteridophytes is dependent on water for fertilization. However, the asexual generation-sporophyte-of Pteridophytes are increasingly able to cope with aerial environment. Pteridophytes resemble higher plants in having a complex internal organization, vascular elements, but differ from them in lacking the seed habit and pteridophytes of the past had seed-like structures.

The Western Ghats region of the Peninsular India is considered rich species diversity of pteridophytes. Pteridophytes represented globally by 12,000 species of which 1000 species distributed in India (Dixit, 2000). In 1984 Manickam V S and Ninam C A prepare a book entitled on "Ecological studies on the fern flora of the Palni Hills (South India)" on ecology, distribution, synonym and correct nomenclature of the Indian pteridophytes. Sumesh Dudani et al tells that the Western Ghats harbor about 320 species of ferns and fern allies with more species diversity in the southern part. In 1991 Madhusoodanan listed rare and endangered ferns of the Kerala. Thattekad Bird Sanctuary is considered to be one of the pteridophytes rich regions of forest in Ernakulam District, Kerala. The pteridophytes are essential component of the ecosystem. It is used for a good indicator of deforestation and habitat destruction. In present scenario many pteridophytes face to many threatened situation.

Pteridophytes are the least document plants among the floristic study of most of the ecosystems, especially in tropical regions. In India the study is not different. Most of the naturalists selected Central India and Himalayan region. Some of them are worked South India especially Western Ghats, but the study still under explored. More concentrated works on Pteridology have been made to explore the Pteridological diversity, in a comprehensive manner. In Kerala, recent studies conducted by the researchers of Calicut University, have reported several new records and new species. They described the importance of conservation of pteridophytes, while most of species are endangered. The literature revealed that number of work has been done on biodiversity in Kerala; no detailed account on the pteridophytes species diversity in Dr. Salim Ali Bird Sanctuary Thattekadu is available. The present study aims to prepare floristic records of Pteridophytes of Dr. Salim Ali Bird Sanctuary, Thattekad, situated in Ernakulam District of Kerala.

Methodology:

Study Area:

The Dr. Salim Ali Bird Sanctuary, Thattekad lies between 76° 40' and 76° 45' E and latitudes 10° 7' and 11° N. It covers an area of 25.16 km². The elevation ranges between 35 m and 523 m. The major forest types are tropical evergreen forests, semi-evergreen forests, tropical moist deciduous forests and plantations of Teak and Mahogany. April- May months are hottest period and December- January is coldest period. Atmosphere temperature varies from 20 °C to 32 °C and rainfall varies from 1400 – 23200 mm. The habitat of the forest of the sanctuary is suitable for sustain of the pteridophytes.

Collection and Preservation:

This analysis is mainly based on the observations made by the authors during floristic exploration. Specimens were collected during August 2009- February 2010 incorporated in the herbaria of Deva Matha College, Kuravilangad, Kottayam.

Identification:

The identification of collected pteridophytes was done by referring authentic literature (flora of Calicut, fern flora of Malabar (Nayar, B.K and Geevarghese, K, K; 1993), etc) and herbarium (Calicut University Herbarium (CALI), Calicut).

Result and Discussion:

The present study recorded 30 species belonging to 18 pteridophytes families from Dr. Salim Ali Bird Sanctuary, Thattakad are listed below. About 25 % of pteridophytes have conservation status. Family Pteridaceae represented with 14 % of species and it is the largest family. Family Polypodiaceae and Adiantaceae are considered as second level or the second largest family. Each family is represented with 11 % of species. In third level we included three families each of them represented with 7% of species (Thelypteridaceae, Hemionitidaceae and Lindsaeaceae). Fourth level includes 12 families represented with 4 % of species each.

List of Pteridophytes:

1. Adiantaceae
 - Adiantum indicum* Linn
 - Adiantum latifolium* Lam
 - Adiantum raddianum* C. Presl, Tent Pterid
2. Aspidaceae
 - Dryopteris hirtipes* (Bl.) O. Ktze
3. Aspleniaceae
 - Asplenium polydon* G. Forst.
4. Athyriaceae
 - Diplazium esculentum* (Retz) Sw
5. Blechnaceae
 - Blechnum orientale* Linn.
6. Dennstaedtiaceae
 - Microlepia speluncae* (Linn) Moore (Hook) Sledge
7. Hemionitidaceae
 - Hemionitis arifolia* (Burn) Moore
 - Pityrogramma calomelanos* (Sw.) Link, Handb.
8. Hymenophyllaceae
 - Crepidomanes intramarginale* (Hook. & Grev) Copel
 - Trichomanes intermarginale* Hook & Grev
9. Lindsaeaceae
 - Lindsaea ensifolia* Sw.
 - Odontosoria chinensis* (L) J. Sm
10. Lygodiaceae
 - Lygodium flexuosum* (Linn) Sw., Schrad.
11. Nephrolepidaceae
 - Nephrolepis cordifolia* (Linn)
12. Parkeriaceae
 - Ceratopteris thalictroides* (Linn) Brongn
13. Polypodiaceae
 - Drynaria quercifolia* (Linn) J. Sm., Hook. J.
 - Microsorium nigrescens* (Bl) Cospel.
 - Microsorium pteropus* (Bl.) Nayar
14. Pteridaceae
 - Pteris biaurita* Linn.
 - Pteris confusa* T.G Walker
 - Pteris gongalensis* T.G Walker
 - Pteris praetermissa* T.G Walker
15. Salviniaceae
 - Salvinia molesta* Mitch.
16. Selaginellaceae
 - Selaginella delicatula* (Desv. ex Poir.) Alston.
17. Stenochlaenaceae
 - Stenochlaena palustris* (Burm.). Bedd.

18. Thelypteridaceae

Christella dentata (Forsk) Brownsey & Jeremy

Christella parasitica (Linn.)Lev

Cyclosorus interruptus (Willd) H. Ito



Figure 1: a. *Selaginella delicatula* (Desv. ex Poir.) Alston. b. *Microsorium pteropus* (Bl.) Nayar ; c. *Microsorium nigrescens* (Bl.) Cospel.; d. *Lygodium flexuosum* (Linn.) Sw., Schrad.; e. *Drynaria quercifolia* (Linn.) J. Sm., Hook. J.; f. *Pityrogramma calomelanos* (Sw.) Link, Handb. ; g. *Nephrolepis cordifolia* (Linn.); h. *Blechnum orientale* Linn; i. *Salvinia molesta* Mitch.

Compositional analysis revealed that 23.33 % species of pteridophytes are endemics, 16.67 % are rare and 10 % are endangered species. *Asplenium polydon* G. Forst., *Blechnum orientale* Linn., *Lindsaea ensifolia* Sw, *Microlepis speluncae* (Linn) Moore (Hook) Sledge, *Microsorium nigrescens* (Bl) Cospel., *Microsorium pteropus* (Bl.) Nayar, and *Selaginella delicatula* (Desv. ex Poir.) Alston. are seven endemic species of pteridophytes in Bird Sanctuary. Rare categories are *Asplenium polydon* G. Forst, *Christella dentata* (Forsk) Brownsey et Jeremy, *Trichomanes intermarginale* Hook & Grev, *Lindsaea ensifolia* Sw. and *Nephrolepis*

cordifolia (Linn.). Three endangered species are identified from sanctuary area. They are *Drynaria quercifolia* (Linn.) J. Sm., Hook. J., *Henionitis arifolia* (Burn) Moore, and *Microlepia speluncae* (Linn) Moore (Hook) Sledge.



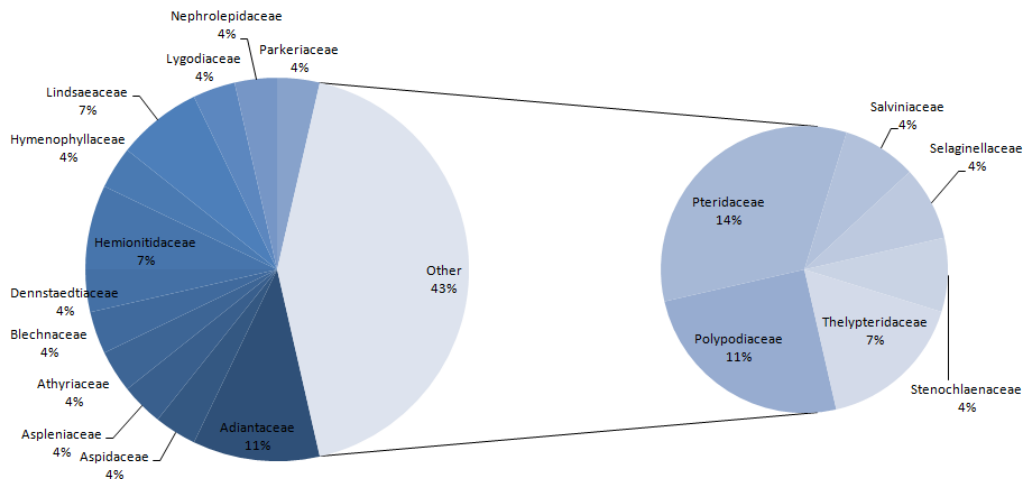
Figure 2: j. *Trichomanes intermarginale* Hook.&Grev; k. *Lindsaea ensifolia* Sw.; l. *Cyclosorus interruptus* (Willd) H. Ito; m. *Stenochlaena palustris* (Burm.) . Bedd.; n. *Asplenium polydon* G. Forst.; o. *Christella dentata* (Forsk) Brownsey & Jeremy; p. *Ceratopteris thalictroides* (Linn.) Brongn; q. *Diplazium esculentum* (Retz)Sw; r. *Dryopteris hirtipes* (Bl.) O. Ktze.

Table 1: The number of genera, species and G/S Ratio in the families of pteridophytes and the number of species in the genera in Dr. Salim Ali Bird Sanctuary, Thattekad, Ernakulam District of Kerala

Number	Taxon	Genera	Species	G/S Ratio
		Families		
1	Adiantaceae	1	3	0.33
2	Aspidaceae	1	1	1
3	Aspleniaceae	1	1	1
4	Athyriaceae	1	1	1

5	Blechnaceae	1	1	1
6	Dennstaedtiaceae	1	1	1
7	Hemionitidaceae	2	2	1
8	Hymenophyllaceae	2	2	1
9	Lindsaeaceae	2	2	1
10	Lygodiaceae	1	1	1
11	Nephrolepidaceae	1	1	1
12	Parkeriaceae	1	1	1
13	Polypodiaceae	2	3	0.67
14	Pteridaceae	1	4	0.25
15	Salviniaceae	1	1	1
16	Selaginellaceae	1	1	1
17	Stenochlaenaceae	1	1	1
18	Thelypteridaceae	2	3	0.67
Genera				
1	<i>Adiantum</i>	3	0.33	
2	<i>Asplenium</i>	1	1	
3	<i>Blechnum</i>	1	1	
4	<i>Ceratopteris</i>	1	1	
5	<i>Christella</i>	2	0.5	
6	<i>Crepidomanes</i>	1	1	
7	<i>Cyclosorus</i>	1	1	
8	<i>Diplazium</i>	1	1	
9	<i>Drynaria</i>	1	1	
10	<i>Dryopteris</i>	1	1	
11	<i>Hemionitis</i>	1	1	
12	<i>Lindsaea</i>	1	1	
13	<i>Lygodium</i>	1	1	
14	<i>Microlepia</i>	1	1	
15	<i>Microsorium</i>	2	0.5	
16	<i>Nephrolepis</i>	1	1	
17	<i>Odontosoria</i>	1	1	
18	<i>Pityrogramma</i>	1	1	
19	<i>Pteris</i>	4	0.25	
20	<i>Salvinia</i>	1	1	
21	<i>Selaginella</i>	1	1	
22	<i>Stenochlaena</i>	1	1	
23	<i>Trichomanes</i>	1	1	

According to the present study twelve families are represented as monospecific (with single genus and species). Family with maximum number of species is in Pteridaceae with 4 species. Followed by Adiantaceae and Polypodiaceae(each family with 3 species). Under Hemionitidaceae, Lindsaeaceae and Thelypteridaceae we identified only two species. Most diverse family is Pteridaceae with lowest species genus ratio 0.25 and also most diverse genera doesn't show any diversity (G/S = 1).



Graph 1: Diversity of pteridophytes from Dr. Salim Ali Bird Sanctuary, Thattekad, Ernakulam District of Kerala

Conclusion:

The present study clearly indicates that forest of Dr Salim Ali Bird Sanctuary have conservation pockets of some rare and endemic pteridophyte species. This study revealed that the presence of 30 species belonging to 18 pteridophytes families in sanctuary. Sanctuary consists of four levels of pteridophyte species. First level included only family Pteridaceae. Second level included two, third level contains three and fourth level contains twelve families. So the family wise taxonomic occurrence ratio is 14: 11: 7: 4. Also Dr. Salim Ali Bird Sanctuary 23.33 % species of pteridophytes are endemics, 16.67 % are rare and 10 % are endangered species. Most diverse family is Pteridaceae and twelve families are represented as monospecific families. This paper responsible to aware the importance of these species among the local people and also great need to have in situ or ex situ conservation.

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References:

1. Manickam V.S. and Ninan C.A. (1984). Ecological studies on the fern flora of the Palni Hills (South India). Today's and tomorrow's printers and Publishers, New Delhi.
2. Madhusoodanan, P. V. (1991). Rare and endangered ferns and fern-allies of Western Ghats of Kerala. In: Karunakaran, C. K. (ed.), Proceedings of the Symposium on Rare, Endangered and Endemic Plants of the Western Ghats. Thiruvananthapuram, India. pp. 103-107.
3. Nayar, B. K and Geevarghese, K. K (1993). Fern Flora of Malabar. Indus Publishing Company, New Delhi.
4. Dixit, R. D (2000), Conspectus of Pteridophytic diversity in India. Indian Fern Journal, 17: 77-91.
5. Sumesh Dudani, Subhash Chandran, M. D and Ramachandran, T. V (2012). Pteridophytes of Western Ghats, Biodiversity documentation and taxonomy. Narendra Publishing House. Pp. 343-351.