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Review Article

Chasmophytic Pteridophytes in Urumbikkara Hills of Idukki District, Kerala, India

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ABSTRACT

The present study highlights the information on 15 species of chasmophytic pteridophytes belonging to 11 families and 11 genera were distributed in the rocky cliffs and crevices of Urumbikkara hills of Idukki district, Kerala. This study also emphasizes certain medico and ornamental potentialities of these plants.

Key Words: Chasmophytes, Pteridophytes, Urumbikkara hills, Kerala

INTRODUCTION

The pteridophytes constitute a significant part of the earth's plant diversity and being the second largest group of vascular plant communities. Pteridophytes are represented by about 305 genera, comprising more than 10,000 species all over the world. About 191 genera and more than 1000 species are reported from India. [1] Pteridophytes (ferns and fern allies) are called as reptile group of plants and are one of the earliest groups of vascular plants. Most of the indigenous people are not well known about the uses of Pteridophytes since it is not easily available like flowering plants. [2]

Pteridophytes have an important role in the earth's biodiversity. Economic and medicinal values of higher plants have been investigated thoroughly, unfortunately Pteridophytes have been ignored. There is not much information was available on the literature about the medicinally important except a few studies. [3] Besides the economic values, a large number of them are cultivated for their ornamental value either in indoors of the houses or outdoors in the botanical gardens due to their delicate beauty and grace. [4]

The vegetation on the surface of rocks or stones may be termed as lithophytes and it in crevices of rocks in which more finely grained components and more water accumulate than on the surface, produce a somewhat copious vegetation, that of chasmophytes.[5] Rocky cliffs are the microhabitats in which slightly mineral rich and it can support the growth and survival of many chasmophytic species. The occurrence of such habitat is ultimately depends on number of factors such as geographical location, levels of exposure, high

evaporation rates, nature of soil geology and water runoff during the rainy season. [6]

The chasmophytic species growing on rock crevices and cliffs have to deal with an extremely inhospitable environment. Therefore they have developed several adjustments such as strong roots and reduced life form structure. This root system also supports them on the cliffs and also allows the maximum exploitation of the little water and nutrients contained in minimum soil. More over this habitat is susceptible to strong winds and full sunlight, as there is no tall vegetation to protect it from these climatic factors. [7]

MATERIALS AND METHODS

Study Area: Urumbikkara Hills Idukki district, Kerala

The present study was conducted in the rocky habitats of Urumbikkara hills (9º 15' and 10º 21' of North latitude and 76º 37' and 77º 25' of East longitudes) of Idukki district, Kerala. It is one of the biodiversity rich region of Western Ghats possess many floristic elements with varied climatic conditions. The temperature ranges between 19°C-34^0 C. The humidity is about 45-61% and wind from west at 10 K/h. This area gets rain from two monsoon seasons, the South-West monsoon and the North-East monsoon. The average rainfall is around 3600 mm per year. The South-West monsoon starts in June and ends in September. The North-East monsoon season is from October to November. Pre-monsoon rains during March to May are accompanied by thunder and lightning. The months like December, January and February are cooler, while March, April and May are warmer. [8]

Documentation

The comprehensive field works was undertaken in the Urumbikkara hills of Idukki district, Kerala during December 2013 – April 2014. During the field visits, chasmophytic ferns were collected at their reproductive stages to prepare herbarium specimens. [9] The correct identity of such specimens were revealed with the help of available Floras and Literature. [10,11] The various economic values of such species were obtained by the discussion with local inhabitants of the study area. The voucher specimens were deposited in the Herbaria of Department of Botany, Deva Matha College, Kuravilangad, Kottayam for future reference.

RESULTS AND CONCLUSION

The present paper records 15 chasmophytic pteridophytes representing 11 genera and 11 families (Table-1). The families like Adiantaceae, Aspleniaceae, Cheilanthaceae and Selaginellaceae are the dominant ones with 2 species each and others possess single species each. Out of these certain species like *Actinopteris radiata* Link., *Adiantum raddiannum* L., *Adiantum venustum* D.Don., *Anisocampium cumingianum* Persl., *Asplenium trichomanes* L., *Cheilanthes tenuifolia* (Burm.f) Sw., *Drynaria quercifolia* (Borry) J.Smith, *Lygodium flexuosum* L., *Pteris biaurita* L., *Selaginella delicatula* (Desv. *ex* Poir.) H.S. Kung and *Selaginella involvens* P. Beau. are utilized by local inhabitants of Urumbikkara hills to cure various ailments such as fever, diarrhea, asthma, diabetes, joint pain, body pain, poisonous bites etc., While the species like *Asplenium inaequilaterale* Willd., *Cheilanthes mysurensis* Wall. *ex* Bedd., *Dryopteris atrata* (Kunze) Ching and *Parahemionitis cordata* (Roxb. *ex* Hook. & Grev.) Fras. are used as ornamentals for their attractive ornamental potentialities such as good looking habit with beautiful fronds.

Table: 1- Chasmophytic pteridophytes in the Urumbikkara Hills of Idukki, Kerala

Sl. No.	Botanical Name	Family	Uses
1.	*Actinopteris radiata* Link (Pl.1A)	Actinopteridaceae	The leaf juice is given orally to cure diarrhea
2.	*Adiantum raddiannum* L. (Pl.1B)	Adiantaceae	The juice obtained from whole plant is used for treatment of asthma
3.	*Adiantum venustum* D.Don. (Pl.1C)	Adiantaceae	The extract from the rhizome can be used to treat diabetes and liver problems
4.	*Anisocampium cumingianum* Persl	Athyriaceae	The juice of the leaves used as good remedy for wasp sting
5.	*Asplenium inaequilaterale* Willd.	Aspleniaceae	Good looking fern for ornamental purposes
6.	*Asplenium trichomanes* L.(Pl.1D)	Aspleniaceae	Leaf extract used to cure cold
7.	*Cheilanthes mysurensis* Wall. *ex* Bedd.	Cheilanthaceae	Beautiful fern with thin fronds
8.	*Cheilanthes tenuifolia* (Burm.f) Sw.	Cheilanthaceae	Juice obtained from the leaves is mixed with hot water and taken orally along with honey to treat throat pain
9.	*Drynaria quercifolia* (Borry) J.Smith (Pl.1E)	Drynariaceae	Skin removed rhizome is made into a paste and boiled with pepper, cumin seeds, onion and garlic along with water. The mixture thus obtained is taken orally to get relief from body pain, knee pain and joint pain.
10.	*Dryopteris atrata* (Kunze) Ching	Dryopteridaceae	Attractive habit
11.	*Lygodium flexuosum* L.	Lygodiaceae	The root juice is applied on the affected region to get relief from rheumatic pain
12.	*Parahemionitis cordata* (Roxb. *ex* Hook. & Grev.) Fras.	Hemionitidaceae	Attractive frond hence, this fern is commonly known as "Rabbit's ear fern".
13.	*Pteris biaurita* L.	Pteridaceae	The rhizome is ground into paste and applied over the affected places to get relief from body pain.
14.	*Selaginella delicatula* (Desv.) Kung	Selaginellaceae	The whole plant juice is applied on wounds
15.	*Selaginella involvens* P.Beau. (Pl.1F)	Selaginellaceae	The whole plant juice is applied on poisonous bite

The Studies on some medico-potential pteridophytes were documented from the Kolli hills of Namakkal district, Tamil Nadu by Perumal. [12] Their study enumerates that, the Pteridophytes are widely used by the local people and tribes for the treatment of various diseases which are commonly occur. These medicinal pteridophytes which are grow in terrestrial, epiphytic and lithophytic habitats. Similarly medico-potential ferns of Adimali region of Idukki district was studied by Priya Ramachandran *et al*. [13] According their study the medicinal uses of 30 pteridophytes belonging to 21 families and 23 genera were documented from the study area. The medicinal uses of such pteridophytic plants and their active constituents would be helpful in treating various kinds of diseases. In addition to these medicinal values, they also highlight some ornamental pteridophytes from the same area. It consists of 25 species belonging to 17 families and 17 genera. According to them this group of plants has least been exploited for the ornamental purpose, hence further exploration of fern and fern allies are essential to evaluate their various economic and ecological importance. [14] The studies on ornamental potential ferns from Nilgiris of Tamil Nadu was done by Sonia *et al.*, [15] According to them the pteridophytes are of immense economic importance as medicinal, food, shelter, ornamental purposes. They documented 153 ferns and 18 fern-allies from Nilgiris of South India. Out of which, twenty potential ornamental ferns listed and those were high lightened with their respective ornamental potentialities.

CONCLUSION

However, large scale deforestation, habitat destructions and various anthropogenic activities may adversely affect the growth and distribution of this valuable group of plants. The present study also highlights the importance of chasmophytic habitats for supporting the life such precious group of plants like pteridophytes. We also recommended that

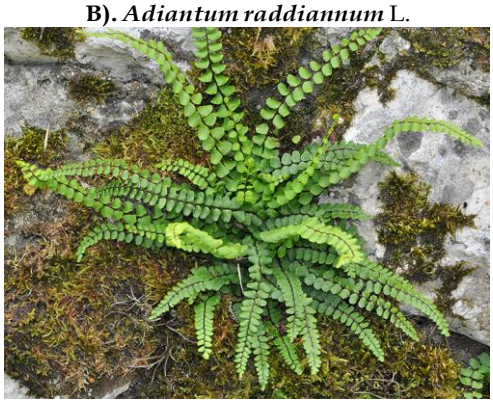
more studies are required for developing *in situ* and *ex situ* conservation strategies for this wonderful ecologically and economically important group of plants for future generation.

PLATE-1

A). ***Actinopteris radiata*** Link

B). ***Adiantum raddiannum*** L.

C). ***Adiantum venustum*** D. Don.



D). ***Asplenium trichomanes*** L.

E). ***Drynaria quercifolia*** (Borry) J. Smith

F). ***Selaginella involvens*** P. Beauv .

REFERENCES

1. Amoroso VB. Pteridophyte and gymnosperm diversity in Musuan, Bukidnon of Philippines. J Syst Biol. 2006; 1: 1-11.
2. Dixit RD. Conspectus of pteridophytic diversity in India. Ind Fern J. 2000; 17: 17 – 91.
3. Deepa J, Parashurama TR, Krishnappa M, Nataraja S. Pteridophytic Flora of Kemmangundi Forest, Karnataka, South

India. Ann Plant Sci. 2013; 2(11): 484-488.
4. Vasudeva SM. Economic importance of pteridophytes, Ind Fern J 1999; 16: 130-152.
5. Schimper AF. Plant geography up on a physiological basis. England: Oxford University Press; 1898.
6. Danin A, Gerson R, Marton K, Garty J. Patterns of limestone and dolomite weathering by lichens and blue – green algae and their paleoclimatic significance. Paleoecol. 1982; 37: 221 – 233.
7. Binu Thomas, Rajendran A. Chasmophytic fern and fern allies of Coimbatore district, Southern Western Ghats, Tamil Nadu, India. Journal of Appl Biol Res. 2012; 11: 1-10.
8. Jikku Maria J, Binu Thomas, Rajendran A, Varghese MC. Ornamental chasmophytes of Urumbikkara hills, Western Ghats region of Idukki District, Kerala, India. Res Plant Biol. 2014; 4(3): 22-28.
9. Jain SK, Rao RR. Handbook of Field and Herbarium Methods. New Delhi: Today and Tomorrow Printers & Publishers; 1977.
10. Manickam VS, Irudayaraj V. Pteridophyte Flora of the Western Ghats- South India. New Delhi: B.I. Publications Pvt. Ltd.; 1992.
11. Manickam VS, Irudayaraj V. Pteridophyte Flora of Nilgiris, South India, Dehra Dun: Bishen Singh Mahendra Pal Singh; 2003.
12. Perumal G. Ethnomedicinal Use of Pteridophyte from Kolli Hills, Namakkal District,Tamil Nadu, India. Ethnobot Leaflet. 2010; 14: 161-72.
13. Priya Ramachandran, Binu Thomas, Sonia A. Medico-potential ferns of Adimali Region, Idukki District, Kerala, India. Pteridol. Res. 2014; 3(2):1-9.
14. Priya Ramachandran, Binu Thomas, Sonia A, Varghese MC. Potential ornamental pteridophytes From Adimali Region of Idukki District, Kerala, India. J Sci Bot. 2014; 4(5): 300-305.
15. Sonia A, Ramachandran VS, Sofia C. Potential ornamental Ferns from Nilgiris, Tamil Nadu. Adv Appl Sci Res. 2012; 3(4): 2388 - 2391.

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