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Ethnomedicinal uses of Pteridophytes in the sacred groves of Kanniyakumari district, Tamil Nadu, India

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ABSTRACT

The study focuses on the ethno-medicinal significance of Pteridophytes which are widely used by the local people residing near the sacred groves of Kanniyakumari district, Tamil Nadu, India. A total of 25 species of pteridophytes were collected from the study area, of these, 20 taxa of pteridophytes are ethnomedicinally important, which are being used in traditional medicinal preparations.

Key words: Ethnomedicinal uses, Kanniyakumari district, Pteridophytes, Sacred groves

Introduction

Ferns and their allies also known as the vascular cryptogamic plants have enormous aesthetic value and multifarious scope for exploring the bioactive molecules against various pathogenic causal organisms of bacterial, fungal and microbial origins. Caius made first effort in 1935 to describe the medicinal uses of some ferns in India and is considered as the first man to take this very initiative of such kind's investigation. Thereafter, Nayar in 1957 and Kaushik & Dhiman in 1995 emphasized and apprehended the medicinal and economic utility of many fern species distributed in India. Many other fern species have been extensively explored and determined to exhibit great economic potential due to some interesting chemical and antimicrobial properties. These plants are distinct in having glycosides, flavonoids, terpenoids, alkaloids and many primary as well as secondary metabolites which are used for preparation of expectorant. Formulations of these plants are also advised as supplement of aphrodisiac, appetizer, stimulants; however, certain species are used for the ailment of diuretic, ulcer as well as stomachic. A few of the pteridophytic species are historically in practice in the homeopathy as well as ayurvedic system of medicines (Jeeva *et al*., 2012; Kumari and Jeeva, 2018; Alfred *et al*., 2018; Jayakumar and Brintha, 2022).

Sacred groves are biologically significant areas that have the highest variety and wealth of biodiversity (Rath and Ormsby, 2020). Besides these sacred groves, the terrestrial biome is also an important ecosystem. Here angiosperms are the abundant vegetation, mainly trees and climbers, relatively limited in the number of herbaceous forms, but this function is replaced by some pteridophytes. The favourable microclimatic condition in the sacred groves ensures the prevalent growth of pteridophytes (Sukumarn *et al*., 2006; 2009). Therefore, the

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present study was conducted in the sacred groves of Kanniyakumari district to document the pteridophytes diversity and special emphasis of its medicinal uses.

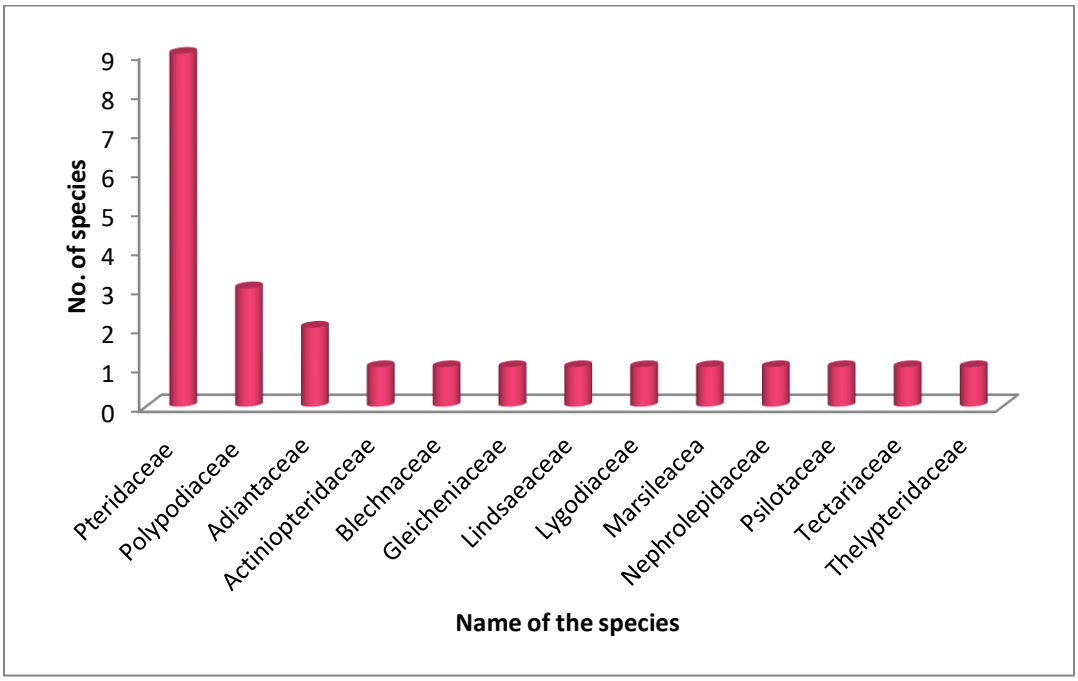
Materials and Methods

A survey of pteridophytes in the study area was conducted during the period of April 2020 to March 2022. While collecting the specimen the habitats of (terrestrial, epiphytic, lithophytes and hydrophytes forms) of pteridophytes were recorded. Morpho-taxonomical features of the specimen were studied and relevant field notes were made from its habitat. Identification was made by referring to available literature and Pteridophytic flora (Manickam and Irudayaraj, 1992). Ethnobotanical uses of pteridophytes were documented with the help of traditional healers and published literatures.

Results and Discussion

Familywise distribution and Family dominance

A total of 24 pteridophytes species were recorded from 13 families among these Pteridaceae was a dominant family with 9 species. Polypodiaceae forms the co-dominant family with 3 species followed by Adiantaceae with 2 species, Actiniopteridaceae, Blechnaceae, Gleicheniaceae, Lindsaeaceae, Lygodiaceae, Marsileacea, Nephrolepidaceae, Psilotaceae, Tectariaceae and Thelypteridaceae with one species each.



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Plant parts used for preparation of medicine

Fronds, rhizomes, whole plant parts, and stems/rachis of pteridophytes are used in the preparation of medicine that is helpful to treat various ailments. Regarding the usage of plant parts, the leaves is used predominantly as medicine (14 taxa) followed by Whole plant (5 taxa), Remaining plant parts (Leaves and root, Rhizome, Rhizome, leaves and root, Rhizome and leaves) taxa are co-dominantly and least dominantly used.

Botanical name	Family	Useful Parts	Medicinal uses	Reference
Acrostichum aureum Linn.	Pteridaceae	Rhizomes and leaves	Its used against worm infections, wounds, peptic ulcers, boils, and bleeding. And the roots of it are used to treat rheumatism, wounds, and boils	Xue Wu et al., 2018
Actiniopteris radiata Sw.	Actiniopteridaceae	Leaves	The treatment of leucorrhoea and also increase fertility.	Shirish et al., 2018
Adiantum incisum Forssk.	Adiantaceae			
Adiantum latifolium Lam.,	Adiantaceae	whole plant	To reduce different types of pain, in Colombia the plant was used for the treatment of skin conditions in connection with inflammation and infection.	Thomas T, 2017
Blechnum orientale Linn.	Blechnaceae	Shoots	Used to cure for intestinal wounds, pulmonary complaints, skin disorders, and urinary bladder infections	Waswa et al., 2022
Ceratopteris thalictroides (L.) Brongn	Pteridaceae	Leaves and root	The leaves and root parts are used as a poultice against skin complaints, such as cuts, wounds, inflammation,	Varsha et al., 2021
Cheilanthes thwaitesii Mett.	Pteridaceae	whole plant	The whole plant parts are ground into paste and mixed with turmeric. The mixture is applied over the affected places to treat cure skin diseases and wounds.	Karthik et al., 2011
Christella parasitica (L.) H.Lév.	Thelypteridaceae	Leaves	Used to treat spermatorrhea, gout and rheumatism	Mithraja et al., 2012
Dicranopteris linearis (Burm.f.) Underw.	Gleicheniaceae	Leaves	Cure to intestinal worms, treat boils, ulcers and wounds, fever, asthma and antibacterial properties	Thomas et al., 2007
Drymoglossum heterophyllum (L)C.Chr.	Pteridaceae	Leaves	swelling, cuts, wounds and fever, small pox , headache	Nair et al., 2016
Drynaria quercifolia (L.) J. Smith	Polypodiaceae	Leaves	Its used to treat traumatic injury, lower back and ligament injuries	Gupta et al., 2021
Hemionitis arifolia (Burm.) Moore.	Pteridaceae	Leaves	It is used in burns, menstrual disorders, antifertility and anti-flatulence. The leaf juice has been used to cure burns and diabetes	Rakkimuthu et al., 2018
Lindsaea ensifolia Sw.	Lindsaeaceae	Leaves	skin infection	Thomas, 2011

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Leptochilus decurrens Blume	Polypodiaceae	Leaves	skin problems, burns, wounds, respiratory infections, coughs, fevers, colds, gastrointestinal problems, abdominal pains, stomach aches, throat infections, snake bites, and nervous disorders	Sathiyaraj et al., 2015
Lygodium flexuosum (L.) Sw.	Lygodiaceae	Rhizome, leaves and root	jaundice, dysmenorrhoea, wound healing, Hair, rheumatism, sprains, scabies, ulcers and eczema.	Singh and Upadhyaya, 2019
Marsilea minuta L.	Marsileacea	Whole plants	increased fertility, nose bleeding, swelling, atopic dermatitis	Marndi and Kumar, 2017
Nephrolepis multiflora (Roxb.) F.M.Jarrett ex C.V.Morton	Nephrolepidaceae	Leaves	It is used to cure Knee pain	Ramesan et al., 2022
Pityrogramma calomelanos (L.) Link.	Pteridaceae	Whole plant	kidney problem, fever, cough and cold, treat asthma.	Karthik et al., 2011
Psilotum nudum L.	Psilotaceae	whole plant	it is used for treatment of diarrhoea and the herb juice showed antibacterial activity	Valavan et al., 2016
Pteris confusa T.G.Walker	Pteridaceae	Leaves	Boils healing	Gracelin et al., 2012
Pteris vittata L	Pteridaceae	Fronds	Used in sores on the tongue, in burns	Verma and Kanwar, 2020
Pyrrosia lanceolata (L.) Farw.	Polypodiaceae	Leaves	Leaf is made into paste with pepper and taken orally to treat sore throat and itching	Karthik et al., 2011
Tectaria coadunata (Wall. ex Hook. & Grev.) C. Chr.	Tectariaceae	Rhizome	ainsect bites , nthelmintic activity, stomach pains, gastrointestinal disorders, eradications of worms in children.	Dubal et al., 2013
Vittaria elongata Sw.	Pteridaceae	Leaves	The leaf is ground into a paste and applied over the affected places to get relief from knee pain and therapeutic pain.	Karthik et al., 2011

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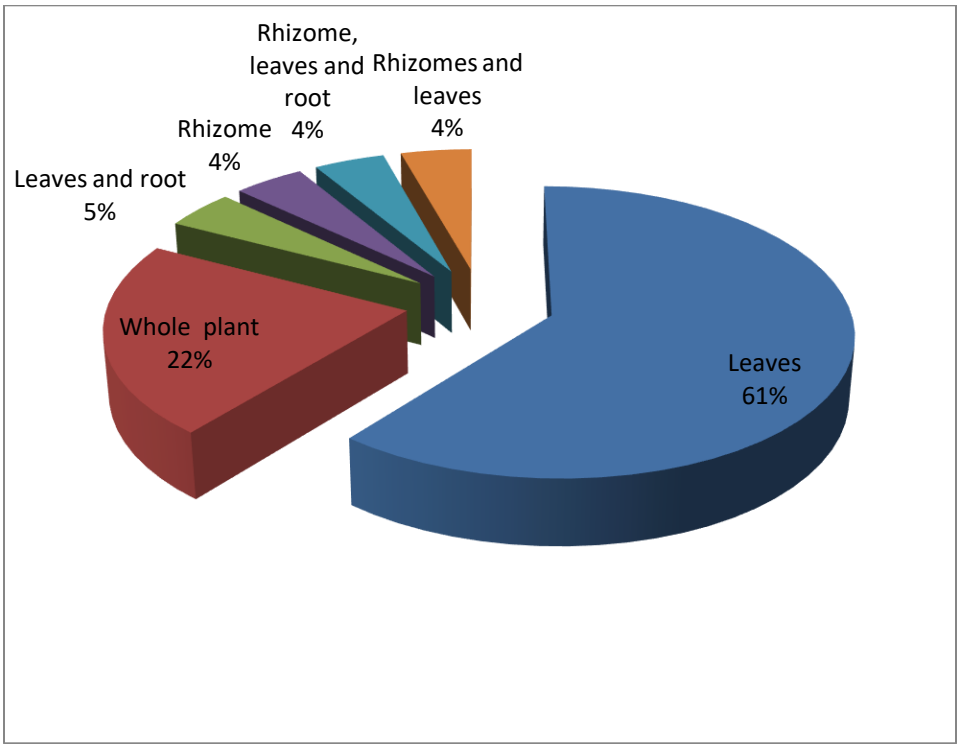

Conclusion

Thus, pteridophytes having tremendous importance and vast medicinal scope would prove itself as the biological resource for the upliftment of human society.

References:

Alfred, V., Sheeja, B.D., Sukumaran, S. and Jeeva, S. 2018. Diversity and ethnobotanical significance of pteridophytes in Marunthuvazhmalai – the southern tip of Western Ghats in Peninsular India. *Haya: The Saudi Journal of Life Sciences*, 3(6): 454-458.

Bosco Lawarence, S. S., Murugan, K., & Greeshma Murukan, P. D. An insight of tradable bioresources ferns and allied fern species. *Gradiva Review Journal*, 8(4) 217- 257.

Dubal, K. N., Ghorpade, P. N., & Kale, M. V. (2013). Studies on bioactive compounds of Tectaria coadunata (wall. Ex hook. & Grev.) C. Chr. *Asian J Pharm Clin Res*, *6*(2), 186-187.

Gracelin, D. H. S., De Britto, A. J., & Kumar, P. B. J. R. (2012). Antibacterial screening of a few medicinal ferns against antibiotic resistant phytopathogen. *International Journal of Pharmaceutical Sciences and Research*, *3*(3), 868.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11,Iss 8, Dec 2022

Gupta , S. R., Bhandari J. B., Chhetri , P. K. (2021). Ethno-medicinal properties of *Drynaria quercifolia* (L.) J. Smith'. *International Journal of Creative Research Thoughts*, 9(4), 5464- 5473.

Jayakumar, S. & Brintha, T.S.S. (2022). Checklist of the pteridophytes of Chunkankadai hillock, Kanniyakumari district, Tamil Nadu, India. *International Journal of Food and Nutritional Sciences*, 11(S3): 3048-3055.

Jeeva, S., Mahesh, M. and Sukumaran, S. (2012). Taxonomic survey of pteridophytes in Chengamal forest - Kanyakumari Wildlife Sanctuary, Tamil Nadu, South India. *Indian Fern Journal*, 29 (1,2): 72-75

Karthik, V., Raju, K., Ayyanar, M., Gowrishankar, K., & Sekar, T. (2011). Ethnomedicinal uses of pteridophytes in kolli hills, Eastern Ghats of Tamil Nadu, India. *J Nat Prod Plant Resour*, *1*(2), 50-55.

Kumari, J.G.K.R. and Jeeva, S. (2018). Diversity of Pteridophytes along the stretches of Thamiraparani River (West), Kanyakuamri District, Tamilnadu, India. *Journal of Emerging Technologies and Innovative Research*, 5(1): 1091- 1095.

Kumar, S. V., & Kanwar, S. (2020). Medicinal pteridophytes used in the treatment of various diseases by the inhabitants of Sarkaghat Tehsil, Mandi District, Himachal Pradesh. *Journal of Pharmaceutical Sciences and Research*, *12*(3), 360-364.

Manickam, V. S., & Irudayaraj, V. (1992). Pteridophyte Flora of the Western Ghats, South India. New Delhi: BI Publications 653p

Marndi, S., and Kumar,S. (2017). *Marsilea minuta* L.: An aquatic medicinal fern of Odisha. *Journal of Biodiversity and Conservation*, 1 (2).

Mayilsamy, R. E. V. M., & Rajendran, A. (2016). *Psilotum nudum*: a new medicinal pteridophyte record for the cryptogamic flora of Sirumalai hills, Dindigul district, Tamilnadu, India. Shanlax International Journal of Arts, Science & Humanities, 3(4). 48-52.

Mithraja, M. J., Marimuthu, J., Mahesh, M., Paul, Z. M., & Jeeva, S. (2012). Inter–specific variation studies on the phyto–constituents of Christella and Adiantum using phytochemical methods. *Asian Pacific Journal of Tropical Biomedicine*, *2*(1), S40-S45.

Nair, S. N., Bindu, K., & Bindu, A. R. (2016). Pharmacognostic evaluation of Drymoglossum heterophyllum-(L) C. Chr. *Journal of Chemical and Pharmaceutical Research*, *8*(1), 7-12.

Pingale1 Shirish, S., Deokar2 Dinesh, E., & Punde3 Vikas, M. (2018). Recent developments in Actiniopteris radiata. Recent Approaches in Environmental Protection and Sustainable Development, 165.

Rakkimuthu, R., Naveenraj, B., Benitta, L., & Dhanya, K. (2018). Phytochemical screening and its antibacterial activity of the fern *Hemionitis arifolia* (Burm.) Moore. 7 (13), 603-609.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11,Iss 8, Dec 2022

Sathiyaraj, G., Muthukumar, T., & Ravindran, K. C. (2015). Ethnomedicinal importance of fern and fern allies traditionally used by tribal people of Palani Hills (Kodaikanal), Western Ghats, South India. *Journal of Medicinal Herbs and Ethnomedicine*, *1*, 4-9.

Singh, B. P., & Upadhyaya, R. (2019). A review on ethnobotanical aspect of *Lygodium flexuosum* Linn. *The Pharma Innovation Journal*, 8(6), 489-492.

Sukumaran S, Raj ADS, Irudayaraj V, Paulraj K. (2006). Enumeration of pteridophytes in the sacred groves of Kanyakumari district-south India. *Indian Fern Journal*, 23: 45-51.

Sukumaran, S., Jeeva, S., & Raj, A. D. S. (2009). Diversity of Pteridophytes in miniature sacred forests of Kanyakumari district, southern Western Ghats. *Indian Journal of Forestry*, *32*(3), 285-290.

Thomas, T. (2011). Preliminary antibacterial evaluation of Lindsaea ensifolia Sw. against bacteria involved in skin diseases. *Medicinal Plants-International Journal of Phytomedicines and Related Industries*, *3*(1), 77-79.

Thomas, T. (2017). Antibacterial Evaluation of Gradient Extracts of Adiantum latifolium Lam. towards pathogenic cutaneous bacteria. *J Global Pharma Tech*, 6, 01-04.

Thomas, T., Kurup, G. M., & Sadasivan, C. (2007). Antibacterial activity of Dicranopteris linearis under in vitro conditions. *STARS: International Journal (Sciences)*, *1*(2), 191-195.

Varsha KK, Savithri A,, Ray U, Sharma S, Kaninathan A and Raghavan SC (2021) Extracts from dietary fern, Ceratopteris thalictroides enriched in alkaloids induce apoptosis and lead to tumor regression in mice without causing toxicity to normal cells. *Trends Med*, 2021, 21: 1-8

Waswa, E. N., Muema, F. W., Odago, W. O., Mutinda, E. S., Nanjala, C., Mkala, E. M., ... & Hu, G. W. (2022). Traditional Uses, Phytochemistry, and Pharmacological Properties of the Genus Blechnum—A Narrative Review. *Pharmaceuticals*, 15(7), 905.

Wu X, Huang Q, Xu N, Cai J, Luo D, Zhang Q, Su Z, Gao C, Liu Y. Antioxidative and Anti-Inflammatory Effects of Water Extract of *Acrostichum aureum* Linn. against Ethanol-Induced Gastric Ulcer in Rats. Evid Based Complement Alternat Med. 2018.