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A Study on Pteridopyte Plants of Thamiraparani River, Kanyakumari, Tamil Nadu, India.

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Abstract

Investigation of Pteridophytes plants is distribution and relationship of the plant species over geographic area. Pteridophytes plants are the major wealth of biodiversity and living organisms. This study deals with Thamiraparani riparian zones of Kanyakumari District. Taxonomically Pteridophytes plants inventory showed, a total number of 28 species belonging to 21 genera under 12 families. Out of these, 24 were herbs (85.71 %),shrub, climber, epiphytic and free floating are one each in the study site. Economic values of the recorded species 14 (50%) were medicinal, ornamental 02 (7.1%), Foder 01 (3.5%) and 01 (3.5%) as Green Manure. The current study in Thamiraparani River revealed out of 28 species 8 species listed in rare category. This investigation focused on floristic composition and present status of the riparian vegetation in the middle and lower reaches of the Thamiraparani River brings out many significant features.

Keywords

Biodiversity, Trees, Economic values, Floristic study, Kanyakumari, Thamiraparani. Pteridophytes.

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Contents

1. Introduction

Biodiversity is essential for human survival and economic well being and for the ecosystem function and stability (Singh, 2002). Floristic study and diversity assessments are necessary to understand the present diversity status and conservation of biodiversity. But also act as a prerequisite for much fundamental research in tropical community ecology, such as modelling patterns of species diversity or understanding species distributions (Phillips et al., 2003). Political and scientific concerns have been raised as we are experiencing an increase in species extinction rates caused by anthropogenic activities (Ehrlich and Wilson, 1991). Many kinds of environmental changes influence or determine processes that can both augment and erode diversity (Sheil, 1999).

In India, habitat destruction, over exploitation, pollution and species introduction are identified as major causes of biodiversity loss (UNEP, 2001). The disturbances created by these factors determine forest dynamics and tree diversity at the local and regional scales (Burslem and Whitmore, 1999; Hubbell et al., 1999); this disturbance has been considered as an important factor structuring communities (Sumina, 1994). Sheil (1999) opined that the disturbance of a suitable intensity will increase species richness in old-growth communities in consonance with intermediate disturbance hypothesis of Connell (1978), however, others believe that disturbance cannot increase diversity in genuine old-growth forest (Phillips et al., 1997). The diversity disturbance debate needs further work, and the detailed information on the disturbance gradient of species distribution, dispersion, forest stand structure and species diversity from dry tropical forest is lacking. Prior to forest management operations, biodiversity inventories are used to determine the nature and distribution of biodiversity resources of the region being managed.

Floristic studies acquire increasing importance in recent years in response to the need of developing and under developing countries to assess their plant wealth (Vediya and Kharadi, 2011). Many floristic diversity studies have been conducted in different parts of world, Whittaker and Neighring (1965), Risser and Rice (1971), Nair and Daniel (1986), Gentry (1988), Sukumar et al., (1992), Linder et al., (1997), Kennard et al., (2002), Sagar et al., (2003), Devi and Yadava (2006), Krishnamurthy et al., (2010), Patil and Tayade (2012), Pawade and Rothe(2012), Dabgar (2012). Thus, it is clear that floristic studies are undertaken by many researchers

Figure 1. Map showing the study area

worldwide in different levels. Despite the vast and varied flora in Kanyakumari district of Tamil Nadu, Raj and Sukumaran (1997), Jeeva et al. (2005a, 2005b) and Kingston et al. (2006), have studied the phytodiversity of the region other than hillocks. Nayar (1959), Lawrence (1960), Henry and Swaminathan (1981), Sundarapandian and Swamy (1997), Sukumaran (1997), Paul and Jeeva (2013), Jose et al., (2014), Geetha et al., (2015), the wetland plants of the district with limited objectives (Sukumaran and Jeeva, 2011; 2012) studied and various floristic studies were reported already from this district (Sukumaran and Parthipan, 2014; Arul et al., 2013; Suba et al., 2014; Brintha et al., 2015). Floristic diversity and phytosociological study of the riparian areas have not been explored sufficiently. In the present study of Thamiraparani River area of Kanyakumari Disrtict, Tamil Nadu is selected for the Pteridophytes plants studies on riparian because it has not been given much attention its towards vegetation. Thamiraparani River is the major water source for irrigation and drinking. The knowledge of the plant community is a prerequisite to understand the overall structure and function of ecosystem. Therefore, the present study has been undertaken to assess the Pteridophyte plants analysis and economic values on Thamiraparani river, Kanyakumari district, Tamilnadu, India.

2. Materials and methods

Kanyakumari is the southernmost district of Tamil Nadu. The district lies between 77o 15' and 77o 36' of the eastern longitudes and 8o 03' and 8o 35' of the northern Latitudes. This district is comprised of four taluks namely, Agastheeshwaram, Thovalai, Kalkulam and Vilavancode. The South Eastern boundary is the Gulf of Mannar. On the South and the South West, the boundaries are the Indian Ocean and the Arabian Sea, on the West and North West it is bound by Kerala.

The major river in the district is Thamirabarani locally known as Kuzhithuraiar. This river has two major tribu-

Figure 2. Thamiraparani River and its tributaries

taries, Kodayar, Paraliyar with the Peachiparai Dam and Perunchani Dam, respectively, built across them. There are many tributaries for the Kodayar River of which Chittar I and Chittar II, with their dams, are the major ones. The origin of Tambaraparani River is in the Western Ghats latitude 8.512440 N, Longitude 77.38495 E and the river confluences with Arabian Sea near Thengapattanam, Latitude 8.242156 N, Longitude 77.16720 E, the river flows in two taluks of Vilavancode and Kalkulam viz., Kodayar, Pechiparai, Kadayalumoodu, Thirparappu, Thiruvattar, Kuzhithurai, ST Mancadu and Thenkappattanam about 56 kilometres (35 mi) west of Kanyakumari town (Plate:1,2).

Extensive survey were conducted from 2015-2019 to the study of Thamiraparani river. Regular collection trips were organized during all season covering the entire study area. Trails and trail-less portions of the study area were walked along the two sides of the river. The plants which can be identified in the field were recorded and all other specimens were critically observed; flowers of unidentified plants were preserved and dissected. They were checked with descriptions available in flora of the Presidency of Madras (Gamble & Fischer, 1915 - 1936), Flora of Tamil Nadu (Nair & Henry, 1983,1987,1989), The Flora of Palni Hills, South India (Matthew, 1999), Flora of Tamilnadu Carnatic (Matthew, 1982) Flora of Trivandrum (Mohanan, M. & A. N. Henry. 1994) and Flora of Flowering Plants of the Western Ghats India (Nayar et al., 2014). Identification was further confirmed after matching the specimens with authentic or type sheets in Centre for Biodiversity and Biotechnology (CBB), St.Xavier's College, Palayamkottai, Tropical Botanical Garden and Research Institute (TBGRI), Palode, Kerala, Calicut University Herbarium Calicut, Kerala. Rare unidentified specimens were identified with the help of taxonomists in TBGRI and Botanical Survey of India (BSI), Coimbatore.

3. Results and discussion

Taxonomically Pteridophytes plants inventory showed, a total number of 28 species belonging to 21 genera under 12 families. Out of these, 24 were herbs (85.7 %), shrub, climber, epiphytic and free floating are one each in the study site. Economic values of the recorded species 24 (85.7%) were medicinal, ornamental 02 (7.1%), Fodder 01 (3.6%) and 01 (3.6%) as Green Manure (Table: 1).

A total 28 taxa of Pteridophytes were found to be growing

along the river of Thamiraparani. Of these, family Pteridaceae dominates in terms of species composition with 8 taxa, followed by family Selaginellaceae occupied the Co-dominant position with 4 taxa, Polipodiaceae and Thelypteridaceae with 3 taxa each, Lycopodiaceae and Lygodiaceae were 2 species each and the remaining 6 families were monospecific (Table:2).

Table 1. Check List of recorded Pteridophyte plants in study area

Sl. No.	Botanical Name	Family	Habit	Economic Values	Status
1	Asplenium tenuifolium D. Don.	Aspleniaceae	Herb	Medicine	Common
2	AzollapinnataR.Br.	Azollaceae	Herb	Medicine	Common
3	Stenochlaena palustris (Burm. f.) Bedd	Blechnaceae	Herb	Medicine	Common
4	Hemionitis arifolia (Burm.)Moore.	Hemionitidaceae	Herb	Medicine	Common
5	Huperzia phleginaria (L.)Rothm.	Lycopodiaceae	Epiphytic	Medicine	Rare
6	Lycopodiella cernua (L.)Pic.Serm.	Lycopodiaceae	Herb	Medicine	Rare
7	Lygodiumflexuosum (L.) Sw.	Lygodiaceae	Herb	Medicine	Common
8	Lygodium microphyllum (Cav.) R. Br.	Lygodiaceae	Climber	Medicine	Common
9	Marsilea minuta L.	Marseliaceae	Herb	Fodder	Common
10	Drymoglossum heterophyllum (L.) C. Chr.	Polypodiaceae	Herb	Medicine	Common
11	Drynaria quercifolia (Linn.) J. Smith.	Polypodiaceae	Herb	Medicine	Common
12	Microsorumpunctatum (L.) Copel.	Polypodiaceae	Herb	Medicine	Common
13	Acrostichum aureum L .	Pteridaceae	Herb	Medicine	Common
14	Adiantum caudatumL.	Pteridaceae	Shrub	Medicine	Common
15	Adiantum hispidulumSw.	Pteridaceae	Herb	Medicine	Common
16	Adiantum latifolium Lann.	Pteridaceae	Herb	Medicine	Common
17	Cheilanthes tenuifolia(Burm.f.) Sw.	Pteridaceae	Herb	Medicine	Rare
18	Cheilianthes mysorensisWall. ex Beddome	Pteridaceae	Herb	Medicine	Rare
19	Pityrogramma calomelanos (L.) Link	Pteridaceae	Herb	Medicine	Rare
20	Pteris confusa T.G.Walker.	Pteridaceae	Herb	Medicine	Common
21	Salvinia aduata Desv.	Salviniaceae	Free floating	Green manure	Common
22	Salaginella delicatula (Desvex Poir.)	Selaginellaceae	Herb	Medicine	Rare
23	Salaginella inaequalifolia (HookA& Grev.)Spring	Selaginellaceae	Herb	Medicine	Rare
24	Selaginellatamariseina (P.Beavve) Spring	Selaginellaceae	Herb	Medicine	Rare
25	Selaginellatenera (Hook. & Grev.) Spring	Selaginellaceae	Herb	Medicine	Common
26	Trigonospora ciliata (Wall. ex Benth.) Holttum	Thelypteridaceae	Herb	Medicine	Common
27	Cyclosorus interruptus (Willd.) H.Itô.	Thelypteridaceae	Herb	Ornamental	Common
28	Thelypteris interrupta (Willd.)K.Iwats	Thelypteridaceae	Herb	Ornamental	Common

Table 2. Relative abundance of Pteridophytes

Sl. No.	Family	Genus	Species
1	Aspleniaceae	1	
2	Azollaceae	1	1
3	Blechnaceae	1	1
4	Hemionitidaceae	1	1
5	Lycopodiaceae	2	2
6	Lygodiacea	1	2
7	Marseliaceae	1	1
8	Polypodiaceae	3	3
9	Pteridaceae	5	8
10	Salviniaceae	1	1
11	Selaginellaceae	1	4
12	Thelypteridaceae	3	3
Total		21	28

The current study in Thamiraparani River revealed out of 28 species, 8 species listed in rare category. This investigation focused on floristic composition and present status of the riparian vegetation in the middle and lower reaches of the Thamiraparani River brings out many significant features. The secondary invasive species were confined to the periphery and in disturbed patches of the study area showed disturbance by cattle grazing and other socio-cultural disturbance. This enables the analysis of factors relevant to river protection, biodiversity conservation and other social, economic and ecological dependence.

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