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Current status and in - situ Conservation of *Pteris* species of Eastern and Western Ghats regions of Tamil Nadu

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Abstract

The aim of the present work was reexamined in the *Pteris* species of Southern Western Ghats and Eastern Ghats. During the study period, *Pteris* species were observed by different locality of Southern Western Ghats and Eastern Ghats. A total of 19 species were identified and most of the species were examined in the KMTR regions of Southern Western Ghats, Tirunelveli District. Two endangered species of *Pteris tripartita* SW. and *Pteris wallichiana* J. Agardh were observed by Alagar Kovil hills, Madurai.

Keywords: Pteridophytes, *Pteris*, Pteridiaceae, southern Western Ghats, in- situ conservation

1. Introduction

Pteridophytes are seedless vascular plants, which had a very flourishing past in dominating the vegetation on the earth about 280-230 million years ago. They were growing on luxuriantly in the moist tropical forests and temperate forests and their occurrence in the different ecogeographically threatened regions from sea level to the highest mountains are of much interest [1]. Now more than 12,000 species in pteridophytes occur in the world flora, of which 1,000 species into 70 families and 192 genera occurs in the different parts and 47 species are endemic and several species is going to RET listed species. According to IUCN Red List, out of 511 families of vascular plants currently recognized, 372 of these contain globally threatened and /or extinct species. Now worldwide pteridophyte species are moisture and shade loving plants and dependent upon the microclimatic conditions of the region for their successful survival in that region. So many impacts 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 of plants. 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 [1].

Pteris is a genus of about 300 species of ferns in the Pteridoideae subfamily of the Pteridaceae. The genus of *Pteris* species is distributed in the tropical and sub-tropical regions, but extending southwards into the temperate zone [2]. In India was contains about 50 *Pteris* species and 21 species are recognized in South India. Most of the *Pteris* species in India are present in the Western Ghats and Himalayan region. Several *Pteris* species are large-scale collection of from the forests by the visitors and local people for ornamental and medicinal purposes and during excursions also increases the pressure on these plants. Most of the *Pteris* species are going to endangered or rare categories. Hence, the aim of the present study was field observation and current status of *Pteris* species in Tamil nadu.

2. Materials and Methods

The field work was conducted from several regions of Western and Eastern Ghats of Tamil Nadu period in the April 2017-April 2018. The field visits were every month by different locality of Western and Eastern Ghats. Each *Pteris* species were observed in naked eyes and taking photographs, collection and preservation of fern materials for the during the field trips. Identification of the





collected Pteris species was done with the help of Manickam and Irudayaraj [3] and confirmed by the experts in the field.

3. Results and Discussion

The field observation of the Western and Eastern Ghats regions of Tamil Nadu were reexamined in the Pteris species were represented in the Table -1. A total of 19 Pteris species was identified and most of the species were examine in the KMTR regions of Southern Western Ghats.

Earlier studies, Manickam and Irudayaraj [3] reported 15 species of Pteris from the Western Ghats. Now, we are collected from 19 species in Western and Eastern Ghats. Fraser-Jenkins (2010) reported that 23 species in South India. Earlier, several authors worked out in Pteris species in worldwide [4]. Walker (1960) describes in the Pteris quadriaurita Retz. S.l. complex from Sri Lanka [5]. Nair and Ghosh (1974) reported Pteris confusa T. G. Walker, and *P. gongalensis* T. G. Walker [6].

Table-1: Pteris species of Southern Western Ghats and Eastern Ghats

Sl.No	Species	Locality	Ghats
1.	<i>Pteris argyraea</i> T. Moore	Kodaiyar	Western Ghats
2.	<i>Pteris asporicaulis</i> Wall ex Ag.	Tirunelveli hills and Kolli hills	Western Ghats
3.	<i>P. biaurita</i> Linn.	Tirunelveli hills and Kolli hills	Western Ghats
4.	<i>P. cretica</i> Linn.	Tirunelveli hills and Kolli hills	Western Ghats
5.	<i>Pteris confusa</i> T. G. Walker	Sivagiri, Tirunelveli hills,	Western Ghats
6.	<i>Pteris ensiformis</i>	Tirunelveli hills and Kolli hills	Western Ghats
7.	<i>Pteris kleiniana</i> Christ.	Sivagiri, Tirunelveli hills	Western Ghats
8.	<i>Pteris linearis</i> Poir	Kakachi Sengaltheri and Tirunelveli hills	Western Ghats
9.	<i>Pteris longipes</i> D. Don	Nilgiris	Western Ghats
10.	<i>Pteris mertensiodes</i> Witid.	Nilgiris	Western Ghats
11.	<i>Pteris multiaurita</i> Ag	Sivagiri, Tirunelveli hills	Western Ghats
12.	<i>Pteris otaria</i> Beddome	Tirunelveli Hills	Western Ghats
13.	<i>Pteris quadriaurita</i> Retz.	Tirunelveli hills and Kolli hills	Western Ghat
14.	<i>Pteris reptans</i> T.G. Walker	Kodaiyar	Western Ghat
15.	<i>Pteris pellucida</i> Presl.	Sivagiri Tirunelveli hills, kollihills	Western Ghat and Eastern Ghats
16.	<i>Pteris scabripes</i> Wall. Ex Ag.	Tirunelveli Hills	Western Ghats
17.	<i>Pteris tripartita</i> Sw.	Alagarkovil	Eastern Ghats
18.	<i>Pteris vittata</i> L.,	Kodaiyar and Palayamkottai	Tamiraparani river, Western Ghat
19.	<i>Pteris wallichiana</i> J. Agardh	Alagarkovil	Eastern Ghats

3.1 In situ Conservation ecology of Pteris species

The ecology of Pteris species in Eastern and Western Ghats are very good ecological conditions were observed. The Pteris species were observed in well growth and luxuriant and group of a single species. The majority of the Pteris species were grown in humid, well-shaded forest floors and stream banks of Western Ghats above 500m altitude in South India. Several species were growing in fully shaded areas, some species are sun tolerant and grow well in the open areas. Some species were growing in shaded areas often have larger pinnae, greenish stipe and rachis. Very interesting common species of *P. confusa*, *P. argyraea*, *P. biaurita* and *P. pellucida* were identified in the both Eastern Ghats and Western Ghats, well distributed in the range of 200m to 2400Msl. Several species such as *P. vittata*, *P. cretica*, *P. iongipes*, *P. kleiniana*, *P. aspericaulis*, *P. mertensiodes*, *P. multiaurita* and *P. linearis* are the rare species of South India and they are distributed in the range of 300m to 1200m. *Pteris vittata* was observed in 200 m in urban

areas of Palyamkottai, Tirunelveli District, Tamil Nadu. Two endangered species of *P. tripartita* Sw. and *P. wallichiana* J. Agardh were observed at Alagar kovil hills, Madurai.

In situ conservation actions could have different approaches oriented to preserve genetic, species and ecosystem diversity. We observed in several Pteris species were propagated by spore germination method in natural conditions. In situ conservation of Pteris species were easily distinguished from their sori characters. Their sori are linear and located in marginal of leaves, but are usually not reaching the apices of segments. Most of the pteris species were observed by false indusium protected each sorus previously reported [7-8]. Several authors reported the gametophyte morphology and development of Pteris species such as *P. vittata*, *P. finotii*, *P. fauriei*, *P. exelsa*, *P. wallichiana*, *P. ensiformis*, *P. cretica*, *P. multifida*, *P. deflexa*, *P. denticulata*, *P. tristicula*, *P. faurirei*, *P. incompleta*, *P. berteriana*, *P. chilensis*, and *P. tripartita* were reported having some unique characters [9-15]. The similarity of these species was on spore germination, the





development gametophyte, and gametangia type. Among these species are differed in some gametophytic characters such as the number cell of the filament, germinated time, the formation time of notch, the formation time of gametangia and type of gametophyte development. Spores of Pteris species are tiny objects which are used liberally by ferns for reproduction. Previously, reports on successful germination of spores *in vivo* [17]. The gametophytes of Pteris species are differed in the number of filament cell, germinated time, the formation time of notch and gametangia, margin shape, and the development type. Gametophyte morphological characters can be used as a genus characteristic [18]. In situ conservation of target species is to protect, manage and monitor selected populations in their natural habitats so that the natural evolutionary processes can be maintained, thus allowing new variation to be generated in the gene pool that will allow the species to adapt to changing environmental conditions [19]. To complete this survey of different options for the conservation of ferns, we must consider the existence of banks of spores in the soil. Soil spore banks have a potential role in the conservation of endangered fern species [20-21]. Ramírez-Trejo et al. (2004) emphasized the spore bank in the soil as a potential source for in situ regeneration [22]. Ranal (2004) has also proposed tree bark as another kind of in situ spore bank that could contribute to fern conservation [23]. Hock et al. (2006) studied seasonal patterns of soil spore banks of ferns in grasslands on dolomite rock and stated that, after one year of storage, the number of emerging prothallia in some soil samples increased, presumably because some spores were initially dormant [24]. Soil spore banks can be very useful for population reinforcements and to increase the genetic diversity, especially in threatened species with very small populations, and it is the first option for the recovery of spores for the reintroduction of species in places in which the disappearance of populations is observed.

4. References

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