



Article : PTERIDOPHYTES OF CHANDGAD FOREST OF KOLHAPUR DISTRICT (Maharashtra)

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ABSTRACT

Kolhapur district is situated in the south-western part of Maharashtra. The present study describes the pteridophytic flora of the Chandgad forest. Ten sites were selected for the study. The area was surveyed in different seasons during the years 2007 to 2010. 34 species of ferns and fern allies belonging to 25 genera and 20 families were recorded. Some possible threats to further survival of these are identified and highlighted.

Key words:- nbsp; Pteridophytes, Chandgad forest, Kolhapur, ferns and fern allies.

INTRODUCTION

Pteridophytes are vascular cryptogams and form neglected group of plants in biodiversity. It forms a conspicuous element of vegetation all over the earth's surface. Although, they have been replaced by the spermatophytes in the modern day flora, they occupy an important and a crucial general position. They are group of plants from phylogenetic and evolutionary point of view. This group of plants grows abundantly in Himalaya and hilly regions of Central and South India. About 110 genera and 600 species are found in India (Sukumaran et.al.2009). The only authentic taxonomic work on this group plants are Beddome (1883), Blatter and Almeida (1922), Panigrahi and Dixit(1966, 1967), Sharma et.al.(1977), Dixit (1984), Mahabale (1987), Bir (1987a & b), Manickam and Irudayaraj (1992), Ghosh et. al (2004), Chandra et.al. (2008).

India is among twelve mega gene centers. Eastern Himalayas and Western Ghats are two hotspots. It is with a highly predictable climate has a rich pteridophytic flora. They bloom well in tropical, subtropical, and temperate forests. Pteridophytic survey of different localities has been frequently convinced in various parts of India. Most of Southern Indian Pteridophytes are found in

Western Ghats, which has been explored by many workers Beddome (1883), Manickam and Irudayaraj (1992), Nimphy and Madhusoodhanan (1998). But with special reference to Kolhapur district in Maharashtra it is scanty. Hence the exploration of this group is essential to great range of variability; otherwise many species would perish and disappear. Many taxa of Pteridophytes have been lost or eradicated from Western Ghats due to the present pace of rapid industrialization and exploitation of natural resources. Exhaustive systematic survey of pteridophytic localities for many years by Mahabale (1987) has revealed the occurrence of 59 species from 35 genera in Western Ghats of Maharashtra. Blatter and Almeida (1922) have described 57 species occurring in Bombay Presidency. On the whole, Maharashtra is quite rich in pteridophytes, there are about 55-60 ferns and 11 fern allies known, so far (Mahabale,1987).

Kolhapur the extreme southern district of Maharashtra state, situated between $17^{\circ} 17'$ to $15^{\circ} 43'$ North latitudes and $73^{\circ} 40'$ to $74^{\circ} 42'$ East longitudes. At the Western boundary there is Sahyadri. The main range of Sahyadris form important botanical pockets of high diversity. Western Ghats are the continuous range of mountains, rising up from the India's Malabar Coast. It covers 1600 km, and passes through states like Gujarat, Maharashtra, Goa, Kerala, Karnataka and Tamilnadu. Numerous hills in the mountain range of Western Ghats are continuous and have higher peaks. The average height of the Sahyadri is 1200 m. Many of peaks and hills like Kalasubai, Harischandragad, Mahabaleshwar, Amba, Amboli, Tillari, Phonda etc are in Maharashtra.

The Chandgad taluka is situated ($15^{\circ} - 55$ North latitude, $74^{\circ} -10$ East longitude) at the boundary of Maharashtra, Goa and Karnataka and hold an interesting geography. The major vegetation types are tropical evergreen forests, moist deciduous forests, scrub jungles. The annual rainfall is 5000 mm. The rivers Ghatparni and Tamraparni fowsThe tropical climate with high humidity, moderate temperature and soil type (red lateritic) provide suitable conditions for luxuriant growth of ferns. The landscape diversity of Chandgad taluka provides an additional feature for growth of a variety of ferns and facilitates the survival of a rich diversity. Hence it was thought worthwhile to take up the survey of the forest for pteridophytic diversity. The present work records 34 species of Pteridophytes belonging to 25 genera under 23 families collected from the study area.

The present study was done to fill the gap in the knowledge of Pteridophytic flora of Chandgad with the following specific objectives:

- To survey the ferns and fern-allies found in the Chandgad forest area,

- To prepare a check-list of the ferns and fern-allies found in the Chandgad
- To prepare fern herbaria for future reference,
- To identify possible threats to this group.

MATERIALS AND METHODS

An extensive floristic survey of Chandgad forest was carried out between June 2007 and October 2010. All localities from the Chandgad which are ideally favorable for growth of fern flora were observed. Every possible area which supports the growth of fern flora in the forest region was visited frequently for successive three years. To conduct survey of ferns and fern allies, ten sites (Pargad Fort, Tillari dam, Tillari Hydroelectric Power, Plateau, Ramghat and villages of near vicinity) were selected. Three plots of 1m × 1m were sampled from each of these sites in a random manner. Representative samples of pteridophytes were collected and preserved as herbarium specimens. Epiphytic ferns, aquatic ferns and ferns found on the walls (i.e. those that were not found within the plots but were present in vicinity of the sites) were also sampled. The species were recorded, photographed and identified with the help of different floras Beddome (1883), Alderwerlet van Rosenburgh (1908), Blatter and Almeida (1922), Panigrahi and Dixit (1966 & 1967), Manickam and Irudayaraj (1992), Rodrigues et.al (1996), Ghosh et. al (2004). The voucher specimens are collected as herbarium specimens for identification. Preserved specimens are deposited at Doodhsakhar Mahavidyalaya, Bidri. Some pteridophytic species are cultivated in botanical garden of Doodhsakhar Mahavidyalaya, Bidri

During the survey, possible threats to this group were also identified and recorded. Damage and destruction were considered as major threats. Interviews in an informal manner with visitors and school students with teachers were held to get an idea of collection of ferns by them.

RESULTS AND DISCUSSION

The floristic study shows the richness and diversity of Chandgad forest. Since our study was conducted over three years, it may not have included some pteridophytes that are short lived and appear out of reach of man. This forest serves as corridors for tigers, elephants and many such wild animals and it needs to be explored botanically and zoologically. It is a pouch of great pteridophytic

diversity. There are about 59 species of ferns and fern allies were reported from Kolhapur district (Agashe 1968) out of which about 34 resides in Chandgad. Table No.1 reveals the list of ferns and fern allies recorded. This work is significant because for the first time these species were collected from this region. Pteridaceae is dominant family with 5 species and it is followed by Polypodiaceae (4 species). Thirteen families are monospecific.

The four ferns are less abundant (*Dicranopteris*, *Lygodium*, *Diplazium* and *Azolla*) and the others are common. Compared to flowering plants, Pteridophytes are largely neglected by researchers. But the ferns are becoming popular in horticulture for the beauty and variety of their frond forms. Some of them are widely cultivated as ornamental pot plants. Some Pteridophytes are traditionally used as medicines by the native people from this hilly region. The village dwellers of Chandgad taluka are heavily dependent on natural sources for their day to day life. The Ethnobotanical survey of ferns and fern allies needs further study.

An informal survey of possible threats has revealed that the threats have increased manifold. The main threat identified during the study is improper landscape practices like fire for getting better fodder, over collection of ferns by visitors, for several purposes, particularly ornamental purposes. Some of these ferns are very eye-catching ones, and visitors know that some of these species could very easily be propagated. Damage and destruction are also increased with the construction works, construction of Tillari Dam, Hydroelectric Power Project, and excavation of Bauxite for Aluminium and other developmental activities.

The possible threats to this eco-sensitive group are clear responsibility to conserve them. Therefore, the conservation measures should be extended for *ex situ* conservation for the ferns and fern allies. We are trying to conserve (*ex situ*) them in our college botanical garden. **ACKNOWLEDGEMENTS**

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Table 1 : ferns and fern allies of Chandgad forest.

Sr.No	Name of species	Family	Abundance	Habitat
1	<i>Selaginella delicatula</i>	Selaginellaceae	++++	Terrestrial
2	<i>Selaginella tenera</i>	Selaginellaceae	++++	Terrestrial
3	<i>Selaginella selaginoides</i>	Selaginellaceae	++++	Terrestrial
4	<i>Isoetes coromandelina</i>	Isoetaceae	+++	Semiaquatic
5	<i>Lygodium flexuosum</i>	Schizeaceae	+	Terrestrial
6	<i>Pteris vittata</i>	Pteridaceae	++	Terrestrial
7	<i>Pteris pellucida</i>	Pteridaceae	++	Terrestrial
8	<i>Pteris quadriaurita</i>	Pteridaceae	++	Terrestrial
9	<i>Pteris argyraea</i>	Pteridaceae	+++	Terrestrial
10	<i>Actiniopteris dochotoma</i>	Pteridaceae	++	Terrestrial, Xerophytic
11	<i>Ceratopteris thalictroides</i>	Parkeriaceae	++	Semiaquatic
12	<i>Cheilanthes farinosa</i>	Sinopteridaceae	++++	Terrestrial
13	<i>Pityrogramma calomelanos</i>	Heminitidaceae	++	Terrestrial
14	<i>Adiantum caudatum</i>	Adiantaceae	++	Terrestrial
15	<i>Adiantum lunulatum</i>	Adiantaceae	++++	Terrestrial
16	<i>Adiantum raddianum</i>	Adiantaceae	+++	Terrestrial

17	<i>Pteridium aquilinum</i>	Dennstaedtiaceae	++++	Terrestrial
18	<i>Lindsaea heterophylla</i>	Lindsaeaceae	+	Terrestrial
19	<i>Nephrolepis auriculata</i>	Nephrolepidaceae	+++	Terrestrial
20	<i>Nephrolepis multiflora</i>	Nephrolepidaceae	+++	Terrestrial
21	<i>Dicranopteris linearis</i>	Gleicheniaceae	++	Terrestrial
22	<i>Christella parasitica</i>	Thelypteridaceae	++	Terrestrial
23	<i>Asplenium caudatum</i>	Aspleniaceae	++	Terrestrial
24	<i>Athyrium hohenackeranum</i>	Athyriaceae	++++	Terrestrial
25	<i>Diplazium dilatatum</i>	Athyriaceae	+	Terrestrial
26	<i>Hypodematium crenatum</i>	Dryopteridaceae	++	Terrestrial
27	<i>Tectaria microdonta</i>	Dryopteridaceae	++++	Terrestrial
28	<i>Blechnum orientale</i>	Blechnaceae	++	Terrestrial
29	<i>Drynaria quercifolia</i>	Polypodiaceae	++	Epiphyte
30	<i>Microsorium membranaceum</i>	Polypodiaceae	++++	Epiphyte
31	<i>Microsorium punctatum</i>	Polypodiaceae	++	Terrestrial
32	<i>Lepisorus nudus</i>	Polypodiaceae	++++	Epiphyte
33	<i>Marsilea minuta</i>	Marsileaceae	+++	Semiaquatic
34	<i>Azolla pinnata</i>	Azollaceae	+	Aquatic