

Acclimatization of medicinal fern *Cheilanthes farinosa* Kaulf

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ABSTRACT

Pteridophytes are one of the important components of any mountainous flora which is one of the successful plant groups on the earth. They almost distributed in Western Ghats, Himalaya. These are considered as lower vascular plants. Fern acclimatization and conservation can be considered as a part of conservation biology. Various techniques are established for conservation of medicinal, rare, endangered ferns. Whole ecosystems and biodiversity is considered because of various conservation programmes. Various medicinal ferns also acclimatized under Pune condition and they are conserved. Pteridophytes are vascular cryptogams and form a neglected group of plants in biodiversity. Many fern and fern allies are growing on Himalayan slopes and are used by rural population and many tribal communities for treatment of various diseases. About 110 genera and 600 species are found in India (Sukumaran et.al.2009). 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). The medicinal uses of some ferns and pteridophytes of India have also been described by Caius (1935 b) and Nair (1959). The medicinal uses of 61 different fern and fern allies have been described by Benjamin and Manikam (2007).

***Cheilanthes farinosa* Kaulf.** Commonly called silver fern. It belongs to family Sinopteridaceae. The paste of fronds and rhizomes along with turmeric is applied for skin diseases. Roots are used in eczema and eaten in stomachache as well as veterinary larval infection. The roots are also applied on the wounds. Fronds are utilized in menstrual disorders. Fresh fern has antibacillus activity. The anti-inflammatory and anti-nociceptive activities of *Cheilanthes farinosa* (Forsk.) Kaulf (Adiantaceae), used in many parts of Ethiopia to treat inflammatory skin disorders, were studied using in vivo models of inflammation and pain.

Considering all these medicinal values and other uses of *Cheilanthes farinosa* Kaulf different methods were applied for conservation and tried for its acclimatization under Pune conditions. *Cheilanthes farinosa* Kaulf is collected from Mahabaleshwar. The acclimatized ferns have been successfully maintained in the house garden.

Keywords : *Cheilanthes farinosa* Kaulf, Pteridophytes, acclimatization, conservation, medicinal uses

I. INTRODUCTION

Pteridophytes are one of the most ancient plants. These are non flowering, vascular and spore bearing plants which include ferns and fern allies. India is among twelve mega diversity centers. One can get rich

pteridophytic flora in Eastern Himalayas and Western Ghats. The fern grow luxuriantly in moist tropical and temperate forests. They occur in different eco-geographically threatened regions from sea level to the highest mountains are of much interest. Plants are global resource. Human societies are using plants and

various plant parts for various purposes like medicinal, ornamental, commercial etc. The pteridophytes constitute the primitive vascular plant group and found scattered all over the world having important contribution to the plant diversity. It is one of the major groups which are used for medicinal purpose as well as for other purpose like ornamental etc. . Actually not more attention is given towards the uses of ferns yet it possesses equal economic importance including medicinal uses (Mannan et al., 2008).

Most of the ferns are rare with medicinal value so it should be conserved. The most of the ferns and fern allies are noticed growing luxuriously. But because of human activities there is threat to fern species. Some steps are desired to be taken for their conservation for pteridophytic taxa. Indian fern flora is endemic to country and so it needs special attention conservation. Caius (1935) is supposed to be first man who described medicinal uses of some ferns of India. There are some ferns which are from western India used in folk remedies to cure various diseases. (Puri & Arora in 1961, 1970).

The previous work indicate that the medicinal plants specially the flowering plants are given the more importance in these contents, non-flowering plants particularly fern and fern allies are ignored by scientists. Hence, in present investigation it was decided to conduct a survey of list of the pteridophytes growing in Mahabaleshwar forest area as well as to study their habitats and try to conserve ***Cheilanthes farinosa Kaulf*** species under Pune climatic conditions from Mahabaleshwar.

Mahabaleshwar is located in Satara District at 17.92°N 73.67°E. It has an average elevation of 1,353 metres (4,439 ft) and located about 120 km southwest of Pune and 285 km from Mumbai. Mahabaleshwar is a vast plateau measuring 150 km², bound by valleys on all sides. It reaches a height of 1,438 m at its highest peak above sea level, known as Sunrise Point. Mahabaleshwar distrusted in main villages in addition

to main city; these are Malcolm Peth, Old "Kshetra" Mahabaleshwar and part of the Shindola village. The major vegetation types are tropical evergreen forests, moist deciduous forests, scrub jungles. The annual rainfall is 5000 mm. The rivers venna, koyna, flows during rainy and winter seasons. The tropical climate with high humidity, moderate temperature and red lateritic soil provide suitable conditions for luxuriant growth of ferns. Hence, it was thought worthwhile to take up the survey of the forest for pteridophytic diversity. The present investigation was carried out to fill the gap in the knowledge of fern and fern allies flora of Mahabaleshwar with the following specific

To understand the mechanisms behind acclimatization of ferns in new environment and to suggest conservation means, it is crucial to unravel local and regional dynamics of fern populations. A microclimatic and demographic study of fern populations would give the best information needed for successful conservation of ferns (Menges and Gordon, 1996) and enable the development of realistic spatially open models, allowing for the characterization of local population dynamics and the regional dynamics of the species (Münzbergová et al., 2005; Milden et al., 2006).

For the acclimatization of medicinal fern ***Cheilanthes farinosa Kaulf*** various methods were tried under pune climatic conditions.

II. METHODS AND MATERIAL

Samples were collected from Mahabaleshwar forest area these were compared with herbaria and confirmed from the authorities of BSI, Pune. Based on medicinal use ***Cheilanthes farinosa Kaulf*** was selected . The habit of selected ferns was marked in Mahabaleshwar forest to study microclimatic conditions and soil properties.

Microclimatic conditions of *Cheilanthes farinosa Kaulf*.

Well in exposed dry situations along forest margins, roadside and bridle paths. Grow better on slightly acidic substratum with pH 5.4-5.8

III. RESULTS AND DISCUSSION

Cheilanthes farinosa Forssk (Kaulf)



Cheilanthes farinosa Kaulf



Methods For Acclimatization of *Cheilanthes farinosa* Kaulf

In present investigation, methods were designed based on criteria of microclimatic conditions and substratum (rhizosphere soil) observed in their habitats at Mahabaleshwar.

Earthen or cement/plastic pots were used for acclimatization.

The pot mixture was prepared by mixing coarse sand, brick pieces, shredded moss, rhizosphere soil, garden soil and compost. The proportion was 1:1:1:10.5:0.5:1. The content was mixed thoroughly and pot was filled with pot mixture. The rhizomes of selected ferns (5 numbers) were planted in each pot in such way that the growing points of the rhizomes will remain open.

The pots were distributed in three sets and each set has minimum 5 pots. The pots were maintained in conditions as mentioned in three different methods. These conditions are:

1. Under shade near the northern side of wall.
2. Pots were kept in big sized perforated polythene bags.
3. Pots were kept near humidifier.

A humidifier, constructed of PVC pipe was used to maintain humidity near the culture site. To construct a humidifier a perforated 3-inch diameter 100 cm height pipe was filled with brick pieces, fitted in container containing water, and used to maintain the humidity near the pots. Different parameters like humidity, temperature and light intensity were recorded regularly near the pots to maintain the required climatic conditions at conservation site. The pots were kept on northern side of the wall to avoid direct sunlight. Pots were watered regularly to maintain the humidity. The sprouting of rhizome was noted regularly. The ferns grown under these methods were observed for their growth and percent survival was determined for each fern species.

IV. CONCLUSION

This medicinal fern species selected for acclimatization and multiplication under Pune climatic conditions was observed for its habitats in Mahabaleshwar forest. The observations noted from different locations.

The fern species selected for acclimatization was growing luxuriantly under shady condition, In open places, these were observed only on northern and eastern side of sharp hilly slopes, near water streams or on moist rocks / boulders in the areas where direct sunlight is not reaching or in some other places where only morning or evening sunrays are preponderate.

Almost all the habitats where ferns are growing have been found out of direct noon bright sunlight.

Table 1. Table showing sprouting & survival of *Cheilanthes farinosa* Kaulf

<i>Cheilanthes farinosa</i> Kaulf	Method I Shade + Bricks	Method II Shade + Bag	Method III Shade + Humidifier
sprouting(%)	60.22	78.08	70.08
survival (%)	52.22	68.08	70.08

From table 1.1 *Cheilanthes farinosa* Kaulf showed maximum sprouting in method II and survival in method-III, minimum sprouting and survival in method-I and moderate sprouting and survival in method-III.

Cheilanthes farinosa Kaulf grow in exposed areas under partial shady situations.

V. REFERENCES

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