



## Species Diversity of Adiantum in Melghat Forest of Vidarbha Region

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### Abstract

Melghat forest lies on the southern shoot of the Satpuda range of hills. This part of Satpuda is known as Melghat; consists of hill and vallies. The most prominent geological feature of Melghat is the Gavilgad range of hills which is abundantly rich in biological diversity. The entire area of the Melghat is covered by the forest of the Dry deciduous Teak Forest. *Tectona grandis* is the most important and dominant species distributed in the entire area. The Melghat forest composed of Gugamal National Park with 361.28 Sq.Km. area, Melghat Sanctuary with 788.75 Sq.Km. area and Multiple use area with 526.90 Sq. Km. area. The Pteridophytes are treated as vascular cryptogams. Ecological and environmental conditions of Melghat are favourable for flourish of pteridophytes. Pteridophytes show diversified habitat and great diversity in distribution with reference to the topography, climatic conditions, altitudes and latitudes.

**Key words-** *Pteridophytes, Hair fern, ecology, Adiantum.*

### Introduction -:

The Pteridophytes formed a dominant part of Earth's vegetation in the historic past ( 280-230 million years ago). In the present day flora, excluding the non-vascular plants, they rank only next to the spermatophytes, yet they occupy an important and a crucial central position in the evolutionary history of the plant kingdom. Pteridophytes flourished well during Devonian, Mississippian and Pennsylvanian periods of the late Paleozoic. Pteridophytes show diversified habitat and diversity in distribution with reference to the topography, climatic conditions, altitudes and latitudes. Generally they grow at high altitude in tropical regions in the open and closed forest especially in marshy, shady, moist localities, along the bank of water falls, streams, canals, rivers, shady places of Ghats etc.



Melghat lies on the southern shoot of the Satpuda range of hills. This part of Satpuda is known as Melghat; consists of succession of hill and vallies. Melghat forest is a Dry deciduous type of forest. The annual rainfall varies from place to place within short distances; with the change in altitude and aspects. Rainfall varies from 70 to 200 cm. The moisture present in the invisible form in the troposphere belt of the atmosphere in the Melghat area is known as humidity. The relative humidity in Melghat forest area varies from 63.25- 64.0. The temperature like the rain fall varies considerably with altitude. The minimum temperature of Melghat is 8°C and Maximum temperature goes upto 38°C.

#### **Material And Methods :-**

Pteridophytes division of vascular plants which do not produce seeds. It include Ferns, Club mosses and Horse tail. Pteridophytes formed a dominant part of earth vegetation in the historic past. In the present day flora, they occupy an important and a crucial position in the evolutionary history of the Plant Kingdom.

The members of Pteridophytes distributed in tropical and subtropical regions of India. The Melghat Forest Tropical Dry deciduous Forest has high and low elevations of Valleys and diverse topography. The plant specimens of Pteridophytes were collected in every stage of their growth and habitats and reproduction from different localities of Melghat Forest area. A single specimen with rhizoids, rhizome, frond and sporophyll collected at maturity period of plants. The plants are pressed after the day's trip. The plant specimen were preserved in 4% formaline solution for anatomical study of plant parts.

#### **Observations :-**

Melghat forest has diversity of *Adiantum* species. In Melghat forest there are 3 species of *Adiantum* found. *Adiantum* is also called as Maiden Hair Fern.

##### **1) *Adiantum philipense* L.**

The sporophyte reported at high altitudes of Melghat forest area, common along the road side of ghats. Distributed throughout rainy season in shady places with high humidity. The fertile fronds with sporangium are observed from August to October. The sporophyte shows erect habit. The plant body differentiated into roots, rhizome, fronds and sporangium. The roots produced on the lower side of the rhizome, primary



roots short lived, secondary roots adventitious, hairy, branched and covered withramenta. Rhizome erect, cylindrical, scaly, covered with hairs. Fronds unipinnate with long rachis, alternate, leaf blade, kidney shaped or reniform, entire, leaf let traversed by dichotomously branched veins, venation open dichotomous. Rachis shining black and brittle, 35 to 38 cm long, leaflet 1.0 to 1.5 cm long. Young fronds circinnately coiled . Sori developed on the lower reflexed side of the leaflet.

### 2) *Adiantum incisum* Forsk.

The sporophyte reported from high altitudes of Meghat forest area along ghat roads of Chikhaldara- Semadoh on weathered rocks. The fertile fronds with sporangium are observed from August to October.

Rhizome with hairs, black in colour and creeping in habit, hard in texture. Fronds are circinnately coiled in bud condition. Petiole dark brown and shiny. Fronds unipinnate compound, dichotomously branched, leaf lamina dissected forming six lobes, fronds 15 to 20 cm long, often rooting at the tip, pinnae nearly sessile, 1.5 to 3.0 cm long, nearly round. Roots adventitious and arises in cluster from lower side of the rhizome black with wiry structure, branched, covered with hairs, called ramenta.

### 3) *Adiantum venustum* D.

The sporophyte reported from well wall of Water Purification Department near Kalapani lake. The rare fern of Melghat forest area with restricted habitat. The fertile fronds with sporangium are observed from the month of September. Rhizomes erect hairy, fronds bipinnate compound, roots hairy. Leaflets fan shaped, veins are unbranched, sori are horse shoe shaped. Sori present only on the dorsal side , brown coloured.

### Discussion :-

The pteridophytes are considered as a first vascular land plants that colonized the terrestrial habitat. In the course of evolution they reached upto arborescent habit that has resulted into a gigantic and a thick forest in Siluro- Devonian period. The pteridophytes are treated as vascular cryptogams as they have a well developed conducting system. The plants are with feather like fronds.



Adiantum possess an independent sporophytes with vascular system. They exhibits a grest variation in form, size and strucyure. The shape of the fronds are reniform. And the texture of frond is membranaceous. Adiantum varies in shape of frond.

***Adiantum philipense***

Fronds simply unipinnate, 5-15 pairs, glabrous. Pinnules subimidiolate. Leaf let with free veins. Stipe polished, dark chestnut brown coloured. Pinnae half moon shaped, distinctly stalked. Sori marginal, globose in shape.

***Adiantum incisum***

Frond simply unipinnate, rachis rooting at the apex, pinnae almost sessile, dimidiolate, texture leathery, wedge shaped.

***Adiantum venustum***

Fronds 2- 3 pinnate, pinnules membraneous, margin rounded, notched, slightly glaucous, petiolate, pinnules 2-3 lobed, fertile pinnules lobed with 2-3 notches.

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