

CHAPTER - V

**DISCUSSION**

The Western Ghats have got rich pteridophytic flora due to variations in the altitude and climatic conditions at different places. The ferns grow as undergrowth in the different types of forests found in Western Ghats. A survey of Pteridophytic flora of Western Ghats was undertaken recently. About 46 genera and 105 species of ferns were collected from different localities in the Western Ghats, spread mainly in the states of Maharashtra, Karnataka, Kerala and Goa Territory. They are studied from different aspects i.e. taxonomy, morphology, anatomy and palynology which will help in the identification of ferns.

The present dissertation deals with the palynology of 34 genera and 50 species of ferns. These 34 genera belong to 20 families of ferns.

Among the 50 species of ferns studied in the present piece of work, 24 species are characterised by trilete tetrahedral spores. They belong to families Marattiaceae, Osmundaceae, Gleicheniaceae, Schizaeaceae, Pteridaceae, Sinopteridaceae, Gymnogrammaceae, Lindsaeaceae, Cyatheaceae and Thelypteridaceae. ✓

Rest of 26 species belonging to families Davalliaceae, Oleandraceae, Thelypteridaceae, Aspleniaceae, Athyriaceae, Aspidiaceae, Lomariopsidaceae, Blechnaceae, and Polypodiaceae are characterized by monolete, bilateral spores. ✓

From the family Marattiaceae, the only genus Angiopteris with species A. evecta is studied here. This is the typical genus having trilete spores with perine. Otherwise perine is usually absent in trilete spores. Our observation coincides with that of Nayar (1964).

The family Osmundaceae is represented by Osmunda regalis and its spores are trilete, tetrahedral with inconspicuous trilete mark having short arms.

Gleichenia linearis of family Gleicheniaceae is characterised by trilete, tetrahedral, perineless spores.

Lygodium flexuosum represents the family Schizaeaceae. The spores are trilete, tetrahedral, with rounded corners and verrucose exine.

The Polypodiaceae members are mainly epiphytic and are represented by Drynaria, Pyrrosia and Lepisorus. All of them have monolete, bilateral spores without perine. The exine in D. quercifolia is spinulose, the spines being aggregated in irregular patches with sparsely spinulose areas in between. In Pyrrosia adnascens the exine is verrucate. Lepisorus nudus is characterised by spores with cleavate projections.

Genus Cyathea, represented by C.glabra and C.spinulosa is characterised by trilete tetrahedral spores with granulose exine in former species and later having smooth exine. Both are perineless. In size also they differ. C.spinulosa has smaller spores (28-32  $\mu$ ) than C.glabra (34-36  $\mu$ ).

Family Lindsaeaceae is represented by two genera, Sphenomeris and Schizolegnia. Sphenomeris chinensis is a monolete spore bearing species. It has bilateral, monolete spores with densely granulose exine. The other genus Schizolegnia from the same family is represented by three species, S.heterophylla, S.ensifolia and S.sawantwadiensis. All of them are characterised by trilete, tetrahedral spores. S.heterophylla has comparatively smaller spores (18-21  $\mu$ ) than S.ensifolia (25-36  $\mu$ ) and S.sawantwadiensis (25 to 29  $\mu$ ).

Among Pteridaceae, the genera reported are Acrostichum with single species, A.aureum and Pteris represented by six species. All of them are characterised by trilete, tetrahedral spores. A.aureum is characterised by densely and prominently granulose exine. In Pteris, the spores are trilete, tetrahedral and with a characteristic projecting ridge-like equatorial collar. Verma (1966-67) has recognized three groups of the genus in Himalayan region as Vittata, Cretica and quadriaurita. The species P.quadriaurita is characterised by rugulose exine. The

species P.pelluscens, P.pellucida and P.setigera fall under cretica group of Pteris and in them the exine is verrucose. P.pellucida has smaller spores (23-27  $\mu$ ) than P.pelluscens (nearly 40  $\mu$ ) and P.setigera (nearly 43  $\mu$ ). In P.pelluscens, the aperture is tenuimarginate while in P.setigera, it is crassimarginate. P.vittata is marked from other species in possessing spores with exine having more or less raised reticulum on distal face with tubercles. P.longipinnula comes under vittata group.

Genera Cheilanthes and Aleuritopteris represent the family sinopteridaceae. Cheilanthes is separated from Aleuritopteris in possessing fronds not ceraceous beneath. The spores are trilete tetrahedral. In size, they fall in more or less in the same range. In Cheilanthes tenuifolia the exine is granulose and perine being absent. In Aleuritopteris farinosa and A.albomarginata the exine is with irregular foldings sometimes appearing to be spine like outgrowth. In some spores of A.farinosa, a thin perine like structure is observed.

The genus Pityrogramma calomelonos represents the family Gymmogrammaceae in Western Ghats. The spores are trilete, tetrahedral with triangular amb. Exine is peculiar in having rugulae on proximal side and reticulations of irregular muri and laminae on distal side.

Adiantum lunulatum is commonly occurring in Western Ghats. The species is characterised by trilete, tetrahedral, perineless spores. Exine is granulose.

Family Parkeriaceae is represented by a single genus Ceratopteris with single species, C.thalictroides, which has number of characteristics which makes the genus outstand from other ferns. The spores are markedly large (90-115  $\mu$ ) having striate ornamentation.

From Davalliaceae, Araistegia pulchra is studied for spore morphologic studies. It has monolete, bilateral spores with thick granulose exine.

Family Oleandraceae is represented by Nephrolepis acuta in Western Ghats. The spores are monolete, bilateral with perine tightly adhered to the exine. Exine has fine granulose appearance with warty projections.

Asplenium panicale belonging to family Aspleniaceae is characterised by bilateral, monolete spores with perine granulose in texture and folded irregularly forming a frill like structure.

Genera Lastrea and Nephrodium represent the family, Thelypteridaceae in our collection. L.calcarata has bilateral, monolete spores. The exine is thick granulose with perine.

Nephrodium (Cyclosorus) is represented by four species, N.truncatus, N.molle, N.pteroides and N.dimorpha. All of them have bilateral monolete spores. They possess distinct perine. The perine in N.truncatus is with blunt spine like appendages while that of N.pteroides is granulose and N.dimorpha being wrinkled and folded. Exine is smooth in N.pteroides and N.dimorpha while it is granulose in N.truncatus and N.molle.

Athyriaceae is represented by two species of Athyrium, A.fulcatum and A.hohenkerianum and Diplazium with D.latifolium and D.esculentum, in our collection. These species are characterised by bilateral, monolete spores with distinct perine. A.hohenkerianum is distinguished from A.fulcatum with smooth perine by the presence of folded and wrinkled perine. In addition, the spores of A.fulcatum are smaller than A.hohenkerianum. Spore morphology of both the species of Diplazium is very much similar except the size difference. D.latifolium has larger spores than D.esculentum.

Hypodimatium, Dryopteris and Tectaria represent the family Aspidiaceae, in our collection. H.crenatum has monolete, bilateral spores with granulose, folded perine. Dryopteris coccleata is also characterised by monolete, bilateral spores with smooth perine forming a wavy frill. Tectaria macrodonta also has nearly same type of spores, but they are larger in size and with folded perine.

Family Lomariopsidaceae is represented by Egenolfia appendiculata, Bolbitis virens, B. subcrenata and B. presliana. Egenolfia appendiculata has monolete bilateral spores with perine having spiny outgrowth. In three species of Bolbitis, B. virens has got smaller spores. All three of them are with perine which is finely granulose and folded. In B. presliana only, it is granulose, folded, with spine like outgrowths.

Blechnum orientale of family Blechnaceae has bilateral, monolete spores with smooth perine as distinct loose structure.

From the foregoing account, it is clear that exine ornamentation and perine characteristics are of great importance in separating the different genera and species of ferns. Next is the size of the spores. The present account of spore morphology will prove to be an additional criterion in identification of fern genera and species. It is intended to study more genera of ferns from Western Ghats as they will be collected in future excursion programmes.

you should have explained with concrete examples.