

CHAPTER - I

INTRODUCTION

The term 'spore' is loosely applied to various types of reproductive bodies in Cryptogams, formed by sexual or asexual methods. The akinetes, endospores, exospores, zoospores etc. of algae; uredospores, ascospores, basidiospores, conidiospores etc. of fungi and the pteridophytic spores are covered by this term 'spore'. These spores of Cryptogams develop under suitable conditions into gametophytes (prothalli) which, in their turn, bear the male and female organs producing the haploid units which fuse and produce a sporophytic plant to complete the life cycle.

Pteridophytes, consisting of ferns and fern allies, represent the most primitive group among the vascular plants. Among them, the ferns, by and far, are the most predominant having number of genera and species and wide range of geographical distribution. They possess independent, free living sporophytic and gametophytic generations thus occupying a unique position among vascular plants. The spores, the connecting link between these two generations in the life cycle, have attracted attention of botanists ever since alteration of generations became known.

The fern spores, often loosely termed as the "fern seeds" is the chief means of dispersal of ferns. In many , | E
ways, they are very similar to pollen grains of phanerogams and hence are recognised as an important criterion in the

classification of ferns. To the sorus, the organ bearing spores, great significance is attributed in the fern classification. Along with structure of sorus, a few details of spore morphology, such as shape and presence or absence of perine, happened to be included in the taxonomic descriptions of ferns and fern allies.

| spongia

Most of the fern genera are homosporous except Hydropteridaceae. In both homosporous as well as heterosporous genera, the spores are either radially symmetric, tetrahedral and trilete or bilaterally symmetric and monolete. The aperture is always situated at the proximal end of the spore. Another important feature of fern spore is the presence or absence of perine. The perine is absent in all the trilete spores (except in the spores of Adiantum and Cheilanthes as reported by Harris, 1955, and in Angiopteris as reported by Nayar, 1964) but in monolete spores, it is either present or absent.

? explain

) is it true

| really

The role of spores in fern taxonomy was stressed by Brown (1960) and during the past two decades or so, the studies on spore morphology of ferns have greatly been utilized for taxonomic segregations.

The effective use of spore morphology is evidenced at various taxonomic levels within the pteridophytes. The

presence of perine is characteristic of families Aspleniaceae, Aspidiaceae, Blechnaceae and Davalliaceae. Within the families, the genera are differentiated on the basis of spore morphology. / sp.

Examples : (1) The spores are trilete in Gleichenia and monolete in Dicranopteris of the family Gleicheniaceae.

(2) In Schizaceae the genera Anemia and Mohria have rugulate exine as against the striate or granulose exine in Schizaea. Within the genus Schizaea, the species S.bifida and S.laevigata are distinguished, based on exine ornamentation. The latter is characterised by granulose while the former by reticulate ornamentation. / sp.

The use of spore morphology has proved useful not only for taxonomic purposes but also from phylogenetic point of view and to analyse cytologically the species complexes.

(Nayar, 1969; Tryon & Tryon, 1973; Verma, 1966-67; Wood, 1973; Jermy & Harper, 1971; Bladsell, 1963; Bir and Trikha, 1973; Bir, 1972; Brownsey and Jermy, 1973; Pal and Pal, 1970; Mitui, 1971 etc.)

Recent studies with scanning electron microscope (Knobloch et al., 1971; Mitui, 1971, 72; Britton, 1973; Brownsey and Jermy, 1973; Britton and Jermy, 1974; Tryon

R.M. Jr. and A.I. Tryon, 1973; Tryon and Tryon, 1974) have added new dimensions to this branch of botany. /sp.

With some 300 genera and over 10,000 species so far recorded among the ferns alone, a great deal more is still to be known about the spore morphology of Pteridophyta. But during past two decades or so, the studies on spore morphology of ferns have provided ample data to prove the importance of palynology in taxonomy.

India has a rich Pteridophytic flora due to variety of altitude and climatic conditions. More than 750 species spread over 100 genera of ferns constitute an important component in North Western Himalayas, Eastern Himalayas and Western and Eastern Ghats in Peninsular India, especially in the hilly regions.

Western Ghats, the Sahyadris, is the mountain range lying parallel to the Western coast of India. It starts from Tapti (Tapi) mouth in the north (Gujarat State) to Cape Comarin or Rameshwaram (Kerala State), the southern most point of India. It has wealth of forests, which belongs to Evergreen forest, Semi-evergreen forest, Moist deciduous forest, Tropical dry deciduous forest and Tropical thorn forest. The pteridophytes grow as undergrowth in these forests. /eg.?

The review of literature on Fern flora of Western Ghats

indicates that the ferns are studied mainly from the morphological point of view, particularly the sporophytes. In the present state of our knowledge, it is reasonable to expect that spore morphology may well be one of the major criteria in the taxonomy and identification of the Pteridophytes, more particularly the ferns. With this view point, ferns were collected from number of localities in the Western Ghats. Though the western Ghats are spread from Surat - Dang i.e. northern end of Western Ghats to cape comarin i.e. the Southern most end of Western Ghats, the present piece of work is based on the ferns from Western Ghats distributed in the states of Maharashtra, Karnataka and Goa territory. These three states, on their border lines, have number of localities ideal for fern collection. They are rich as far as number and varieties of ferns are concerned. Hence work was concentrated mainly on these localities.

The spore morphology of 50 species of ferns spread over 34 genera is described here. The spores from freshly collected plants as well as those from the herbarium specimen were taken for the preparation of slides. The slides were prepared by Wodehouse method as well as Erdtman's acetolysis method. The microphotographs, which will give an idea about the spore morphology are included in the present text. The spore

morphology of ferns collected is described in detail. The present piece of work will prove the addition to the knowledge of spropythes of ferns from Western Ghats. It will prove to be the additional criterion in the identification of ferns.