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SPORE STUDY AND GAMETOPHYTES IN *DRYOPTERIS COCHLEATA*

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ABSTRACT

DRYOPTERIS COCHLEATAcollected from Eastern Himalayan spore and gametophytes have been made.Sporesarebilateraltypeandperinnate.TheperiniswrinkledPhotographs.Theexineandperine are both ornamented. The ornamentation blentinolox or spinulose. Spore termination is like vittaria types. The common pattern is of aspidium types. The sex organs i.e. Antheridia and archegonia are similar to other Leptosporangiateferns.

KEY WORD: *DRYOPTERIS COCHLEATA* (D.Don) c.cho Eastern Himalayan-spore and gametophyte.

INTRODUCTION

Dryopter is in India is presented by 56 species. Dryopter is chocleata (D.Don) C.Chr is represented in EasternHimalayas.Dryopterisshowsreticulatedevaluationwithagoodnumberofhybrids.Reticulated evaluationiswellseeninnorthernAmericaspecies.Rhizomeerectorsemi-erect,stout,denselycovered with scales; scales broad, thick, blackish-brown, margin pale-yellowish, ovate-lenciolate, acuminate, about 1.6 x 0.3 cm or more, intermixed with large, ovate ones. Stipes 22-50cm long, tufted, densely scaly at base, sparsely above, mixed with dark-brown ramentae; lamina 30-60 x 15-32 cm, bipinnate, ovate-lanceolate;pinnaenumerous,alternate,petiole,slightlytaperingtothebase,thelowermostbasal pinnae much shorter than those in the above, gradually tapering to a longlanceolate-acite apex, largest pinnate 15-22 x30-60 cm, linear, oblanceolate, shortly stalked, slightly unequal at base, acuminate at apex; pinnules numerous, alternate, very shortly stalked; largest pinnuleupto 2.5 x 1.0 cm, along, auricledattheupperbasalregion,slightlycuneateatlowerbase,bluntorslightlyacuteatapex,margin toothed, each tooth ending in a stiff point, texture soft more or less coriaceous, pale-green when dry, glabrous above, very sparsely pubescent on the under surface; rachis and costae more or less densely clothedwithdark-brown,lanceolatescales;veinsfreeforkedinthesegmentofthepinnules.Sorionthe veinlets, margin slightly loberd, spores round, brown, exine smooth, fertile under favourable climatic condition.

MATERIALS AND METHODS

Morphology, spore nature their germination and Prothallus structure have been taken as prime parameters for analysis, Association of Dryopteridaceae with other ferns and phenological changes were also traced. Mature spores were also collected in small tube and were processed for germination in knop's solution.

The composition of knop's solution are as follows: -$Ca(NO_3)_2 4H_2O$ 0.8 Saltgm/litre

KNO_3	0.2 gm
K_2HPO_4	0.2 gm
$MgSO_4 7H_2O$	0.2 gm
$FePO_4$	Traces.

Pattern, after collection the fronds were cleared with 5% NaOH and chloral hydrate, thoroughly washed and stained with safranin (Mohan Ram and Nayyar 1978).

Busby A.R. (1984) culivated fern spore on the suitable compost medium, which gives excellent results using the following mix: 1/3 part 1/3 part sphagnum moss which has been passed through a 1/4 inch sieve and 1/3 part sharp sand. All parts by volume. I used 5 inch pot as a volumentric measure. To the above mix put add a handful of charcoal.

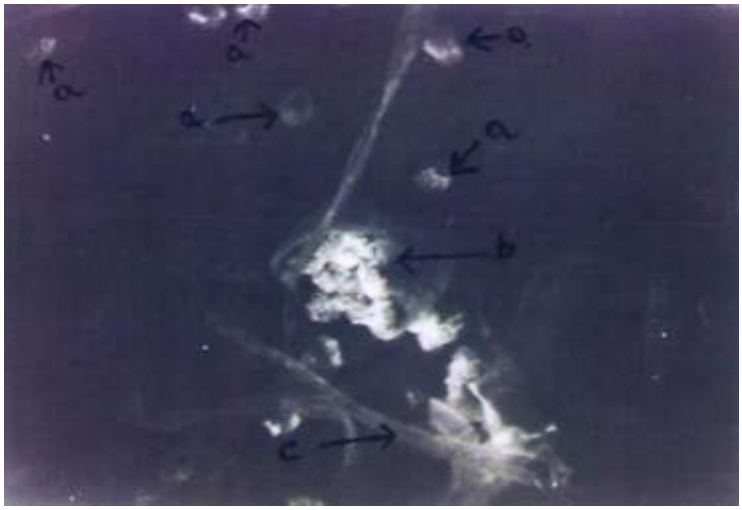
OBSERVATION

In *DryopterisCochleata*spore possess entine and exine layer. Third layer is found in some members. The stage wise termination pattern has been observed in some member of Dryopteris. The germination pattern is similar to all homosporouspteridophytes which form exosporic gametophyte. Spores are bilateraltypeandperinnate.Theperineiswrinkledandparinearebothornamented.Theornamentation is grandiose or spinulose and spore germination is like vittaria. The common pattern is like Aspidium. The prothallus is cordate thalloid, thin and green. It is generally symmetrical broader than longer with lobes or wings on the underside of the prothallus numerous cylinder rhizoids grow out from cells. As observed the grown prothallus is 2 to 7 mm in diameter. In the upper part their is well dipper grove or notch.

PHOTOGRAPH NO.1

Spore ogDryopterissps. (D. cochleata) 40 x 15 = 600showing exine and perine surface wrinkled with zig zag linings, upper polar of one end of the surface marked with

PHOTOGRAPH NO. 2



PHOTOGRAPH NO.2

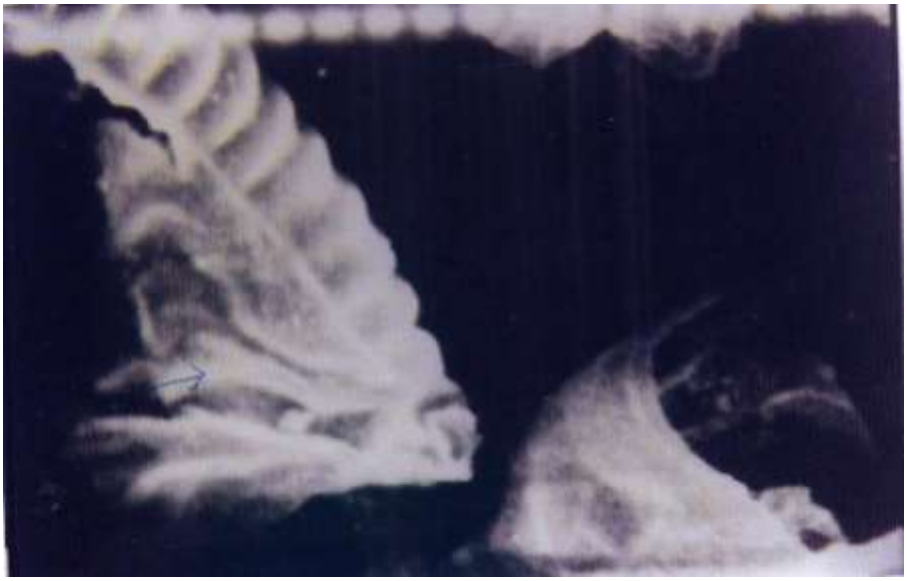
SEM photographs of (Dryopterissps.) Sporangium Showing

- (a) ScatteredSpores
- (b) Spores in Clusters
- (c) Sporangium inner wall thin layer

PHOTOGRAPH NO.3

SEM Photographs of broken Sporangium Showing

(a) Single spore sidevein
(b) Annulus
(c)Broken Wall ofsporangium.
(c) Lateral veins of spore (single) appears shrinked during processing.
(e) Stalk of sporangium.

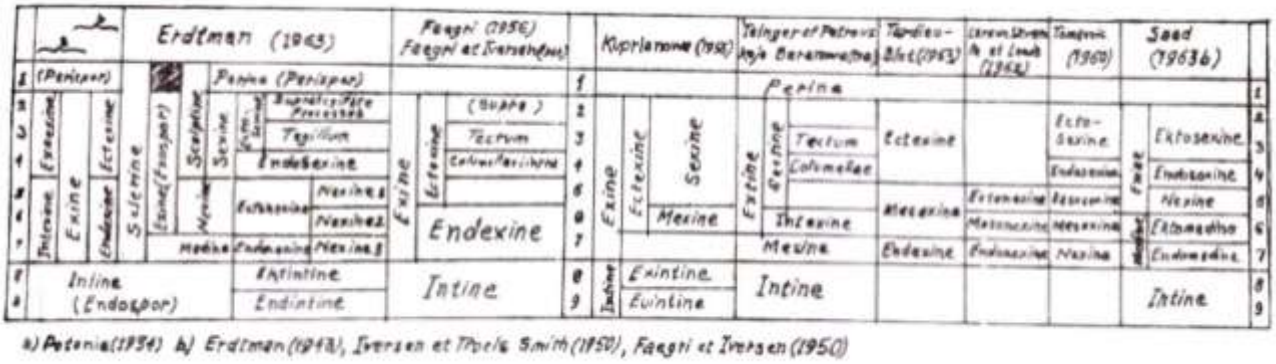


PHOTOGRAPH NO.4

SEM Photographs of broken Sporangium showing

(a) Annulus upper wavy layer.
(b) Inner cell content ofsporangium.DISCUSSION

FamilyDryopteridaceaehasbeenincludeundertheorder Aspidias.Thefamilyhasbeenrecognize dand classified by F.O. Brower (1923) , Copeland E.B (1947), Holttum R.E. (1949, 1973), R.E.G. Pichisermoli (1958), D.W. bierhorst (1971) and BangetW.I.Jr.(1980).



a) Potonie (1934) b) Erdtman (1943), Iversen et Troels Smith (1950), Faegri et Iversen (1950)

The sporodern layer of the spore has been worked by different workers.

The spores are bilateral, It is clear that spores have wrinkled, exine of prime layer. Under favorable condition the spores germination in nature. Artificially spore germination have been observed by the techniques of different workers. The spore germination is identical to other member Vittaria and the prothallial development is typical identical with Aspidium. In spore germination and prothallial development it follows, Vittaria type and Aspidium type. Prothallus is of cordate like other ferns with rhizoids in lower parts. Sex organs i.e. Antheridium and Archegonium is similar to other Leptosporangiate ferns.

Nayar and Kaur 1971 has written with regard to spore germination, It is suggested Nayar and Kaur (1965) that the Vittaria- type of germination is the most advanced and the Amorphous-type, resulting in the formation of a mass of cells, the most primitive characteristic of all the more advanced groupofhomosporousferns,i.e.,groupswhichrepresentthedistalbranchesoftheevolutionarytre e.In contrast Amorphous-type of germination is restricted to the most primitive groups like the Ophioglossida, Marattiidae, some Texas of the Gleicheniaceae and some of the Schizaceae.The Amorphous-type, in which cell divisions occur in all the three planes and thus results in the formation of a nearly globose mass of cells as in the Ophioglossidae(Possibly also in Stromatopteris), is apparently the most primitive. Partial suppression of cell divisions by walls parallel to the equatorial plane of the germinating spore results in a dorsiventral circular mass as found in the Marattiidae. The MecodiumandHymenophyllum-typesofgenerationareapparentlyderivedfromthisbysuppressionof the cell division in the equatorialplan.

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