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STEROLS IN RHIZOME AND LEAVES OF *ISOETES* L FROM RAJASTHAN

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Two species of *Isoetes* namely *Isoetes tuberculata* and *Isoetes rajasthanensis* were collected from Mainal locality of Chittorgarh district during rainy season. Various plant parts, viz. rhizomes and leaves of each species were dried, powdered and analysed for their steroidal contents. Two sterols - stigma sterol and B-sitosterol were identified.

Keywords : Rajasthan; *Isoetes*; Phytochemistry.

Sterols are known as important natural product of plants and have been identified from large number of Angiospermic plants[1]. Stigmasterol, B-sitosterol and campesterol occur abundantly in angiosperms.[2,3] However very little work has been carried out in pteridophytes on this aspect. Bhardwaja *et al.*[4] have isolated three sterols namely B-sitosterol, Cholesterol and Stigmasterol from sporocarps of *M.diffusa* var. *approximata*. The present study on *Isoetes* thus indicates that pteridophytes also have the potentialities to synthesise sterols.

All the localities of *Isoetes* were kept under regular observation throughout the year but material for phytochemical studies was collected mainly during the monsoon periods starting from July to October. Plant material for this study was collected from Mainal (Chittorgarh district). The rhizomes and leaves of each species viz. *I.tuberculata* and *I. rajasthanensis* were dried in shade and powdered. Each of the powdered sample was defatted in soxhlet apparatus in petroleum ether for 24 hrs on a water bath. After filteration the residual mass was refluxed with 15% ethanolic HCl for 4 hrs[5]. The filterate was then separately extracted with ethyl acetate. The ethyl acetate extract was filtered and concentrated to dryness *in vacuo* separately. Thin glass plates (Silica gel G 250 M) containing the crude steroid extract of each sample were developed in organic solvent mixture (chloroform - hexane - acetone, 25:5:23) alongwith various standard reference sterols. The plates were sprayed with aniseldehyde reagent (composed of 0.5 ml of acetic acid) and heated at 100°C for 5 minutes until the characteristic colours developed. The time required for initial appearance of a colour reaction and the colour in UV light (360 nm) was recorded.

Ten replicates in each case were run and their average Rf values calculated. These were found to be comparable to the Rf values of the standard samples. These spots were further confirmed by

Table 1. Characteristics of isolated sterols from *Isoetes*

Plant species	Plant part used	Sterol identified	Rf value	Colour with anisel-dehyde reagent
	Rhizome	Unidentified	0.44	Yellowish green
		B-Sitosterol	0.55	Pinkish purple
I.tuberculata		Stigmasterol	0.91	Purple
	Leaf	B-Sitosterol	0.53	Pinkish purple
		Stigmasterol	0.90	Purple
	Rhizome	Unidentified	0.44	Yellowish green
		B-Sitosterol	0.55	Pinkish purple
I.Rajasthanensis		Stigmasterol	0.91	Purple
	Leaf	B-Sitosterol	0.53	Pinkish purple
		Stigmasterol	0.90	Purple

mp (Toshniwal melting point apparatus) and IR (Perk in Elmer 337, grating infrared spectrophotometer).

The presence of B-sitosterol and sigmasterol in *Isoetes* with reference to its reported presence in *Marsilea*[4] would be interesting for arriving at phylogenetice relationships among the two families. Moreover, this study emphasizes that not only the reproductive parts as reported for *Marsilea*, but vegetative parts like rhizomes and leaves also possess the ability for sterol synthesis. Similar studies of vegetative organs in *Marsilea* would thus be interesting from this point of view.

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