

Ophioglossum petiolatum Hooker, a population with abnormal cones at Ajmer, Rajasthan, India

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ABSTRACT

Description is given of a population of *Ophioglossum petiolatum* Hooker collected from Nagpahar, Ajmer bearing abnormal cones in majority. Anatomy of rhizome, common stalk and tropophyll are normal. Reproduction biology and cytology are to be studied.

Key-words: *Ophioglossum petiolatum*, abnormal cones, Rajasthan.

INTRODUCTION

Ophioglossales are eusporangiate ferns, including three taxa i.e. *Ophioglossum* Linn., *Helminthostachys* Kaulfuss and *Botrychium* Swartz. Pichi-Sermoli (1954) had divided this order into three families and seven genera. Here we have followed three genera scheme. *Helminthostachys* is monotypic (*H. zeylanica*). In India, *Ophioglossum* is represented by approximately 15 species (Yadav & Goswami 2010, Patel et al. 2018). In Rajasthan, 9 species of *Ophioglossum* are known. These are *O. reticulatum* Linn., *O. petiolatum* Hooker, *O. nudicaule* Linn., *O. gramineum* Wild., *O. vulgatum* Linn., *O. lusitanicum* Linn., *O. polyphyllum* A. Braun ex Schub., *O. costatum* R. Br. and *O. indica* Yadav & Goswami. Goswami & Khandelwal (1973) had reported the existence of abnormal cones in *O. nudicaule* and *O. costatum*. Sharma & Singh (1984, 1986, 1986a), Sharma & Vangani (1988) and Singh & Sharma (2008) studied the morphology and anatomy of different species of *Ophioglossum* in Rajasthan. *O. reticulatum*, *O. costatum* and *Helminthostachys*

zeylanica have vessels in the xylem of rhizome (Pant et al. 1993, Sharma et al. 2017). *Botrychium* is peculiar in having secondary growth (Bierhorst 1971). *Ophioglossum* is an interesting genus in cytology showing chromosomal variations n=90 to n= 1440 (Abraham & Ninan 1954, Abraham et al. 1962, Goswami 2007). Investigations on cytology of abnormal cones are likely to provide interesting results.

MATERIAL AND METHODS

The material was collected during the last week of rainy season from Nagpahar, Ajmer. The exact location is above the Pach-Kund area a well known picnic spot between Ajmer and Pushkar. In the hilly area there are small grassy spots. It is in these areas *O. petiolatum* grows during the rainy season. Many plants of this Adar's tongue have abnormal spikes. Out of the selected plants some of them were fixed in F.A.A. for microtome sectioning while other were used in preparation of herbarium sheets. These are present in Pteridophyte Paleobotany Lab. of Botany Department, JNV University, Jodhpur.



Plate 1.

Abnormal cones of *Ophioglossum petiolatum* Hooker; 1. Bifurcated cones equal sized, 2. Unequally divided cones, 3. Bifurcate twisted cones, 4. Unequal closely adhered cones, 5. Closely adhered equally developed cones, All size x 60

OBSERVATIONS AND RESULTS

In the material of *O. petiolatum* five different kinds of abnormal cones have been seen and are described below:

1. Bifurcated well developed spikes on a stalk or pedicel (Plate 1, Fig. 1). Each branch of spike has two rows of sporangia. Actually each bifurcation has an adhered smaller narrow cones i.e. there are four cones in two groups of two each on the stalk.
2. Unequal bifurcated cones both smaller and bigger portion are from top of the stalk. The bigger one has a distinct row of sporangia (Plate 1, Fig. 2).
3. Two twisted, bifurcated, closely appressed, equally developed cones are visible on a stalk (Plate 1, Fig. 3).
4. Three unequally developed cones but closely adhered on a pedicel are visible (Plate 1, Fig. 4).
5. A bifurcated pair of closely appressed cones on a pedicel is seen (Plate 1, Fig. 5).

In some cones sporangial arrangement, size and shape are like the normal cones while in others these are abnormal. Spores are produced in all normal sporangia but the abnormal sporangia do not have spores. The anatomy of root, rhizome, common stalk and tropophyll are normal even in abnormal cones producing plants. Sharma & Singh (1984, 1986, 1986a), Sharma & Vangani (1988) studied the anatomy of normal cone producing plants. However, further investigations are required on plants producing abnormal cones especially on behavior of spores and cytology.

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