Anomalies in female receptacle of *Plagiochasma appendiculatum* Lehm. & Lindenb.- A report from J&K.

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Abstract: The genus *Plagiochasma* belonging to the order Marchantiales has been very well worked out with respect to the structure and development of male and female receptacles. In the present paper, the author reports abnormalities in archegoniophores along with the anatomical details of the same. This report from J&K is altogether new.

1. Introduction

P. appendiculatum has gained a lot of attention with regard to its reproductive structures. Kashyap (1919) commented on the various forms of male receptacles in this species and drew its homology with that of higher Marchantiales in being a branch system. Bapna (1971) elaborated on the abnormal female receptacles in this species and also discussed on its phylogeny. Taylor in 1837 reported androgynous gametophores in *Dumortiera irrigua*, since then reports have added to the other members of Marchantiales (Klein,1881; Okamura,1908; Kreh,1909; Cutting,1910; Bergdolt,1926; Pande and Srivastava,1953; Pande *et al*., 1953 a, 1953 b; Bhattacharya and Pillai,1959; Parihar and Jagdish Lal,1972; Naidu,1973; Terui, 1974 and others).

In normal cases, female receptacles in this species are dorsal, 1-6 lobed, unbranched, subsessile to sessile or shortly stalked, without a rhizoidal furrow. Though a number of populations have been collected over a wide altitudinal range from different districts of Jammu region, the author recorded a deviation from normal structure in only one population collected from Patnitop area . It inhabited epilithic surface and was growing under fully shady condition .

2. Material and Methods

Patnitop is a hilltop tourist site in Udhampur district of J&K. It is located in the lower Himalayan range close to the Pir Panjal range, 47 km from Udhampur and 112 km from Jammu. The collection site was located at an altitude of 2024 m. Collections were carried out periodically so as

to study the different stages of life cycle. The populations were photographed in their natural habitats. Data on reproductive phenology were recorded in the field, whereas anatomical features of gametangia and sporophyte (colour, shape, size, position, number of receptacles, stage of antheridia, archegonia, sporophyte etc.) were studied in laboratory under microscope.

3. Results and Discussion

In the present study, the author got one accession inhabiting epilithic surface (Fig. 1) with abnormalities in archegoniophores. Abnormality was recorded in both disc and stalk of female reproductive organ. Male reproductive structures , on the other hand, were normal horse-shoe shaped.

In one of the thalli, four receptacles were observed. One of the receptacle had dichotomously branched stalk (Fig.2). The two receptacles at the branch point were dissimilar, one was tetralobed and the other was trilobed (Fig .3). All the lobes were fertile. In another receptacle, both the stalk and disc were fused (Fig.4). One of the disc had 3 lobes while as other had 6 lobes but one lobe of each of the disc was fused (Figs. 5 & 6). All the lobes of the 6 lobed receptacle were fertile whereas in case of the 3 lobed receptacle, one lobe at the point of fusion was sterile. Figures 7 & 8 shows the dichotomously branched stalk and the fertile lobes of both the discs at the branch point, Figure 9 show the fusion of one of the lobes as well as of the stalk. Note the presence of fertile lobes (Fig.10) in the 6 lobed receptacle and a sterile lobe in the 3 lobed receptacle at the point of fusion (Fig.11). Figs.12-16 show the section passing through the stalk at the dichotomy and at the base.

P. appendiculatum lacks rhizoidal furrow but the stalk showed some depression at the point of bifurcation . According to Bapna (1971), this depression is regarded as the remnant of a rhizoidal furrow, as found in carpocephalum of *Reboulia*. The branching system also draws its similarity with other higher members of Marchantiales from which *Plagiochasma* has evolved by following the sequence –simplification , reduction and finally elimination of the rhizoidal furrow in the stalk.

The occurrence of these anomalous receptacles is of great interest as they help in drawing a homology which exists between the reproductive structures of various members of Marchantiaceae and at the same time also help in understanding the phylogeny .

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Fig. 1 . Population inhabiting epilithic habitat. Fig. 2. Thallus bearing dichotomously branched stalk. Fig. 3. Dichotomously branched stalk having tetralobed and trilobed discs. Figs. 4-6. Receptacle showing fused stalk and disc. Note the presence of trilobed and hexalobed discs. Fig. 7. V.S of receptacle passing through the dichotomously branched stalk and the fertile lobes. Fig. 8. Shows V.S of receptacle passing through the fertile lobes.

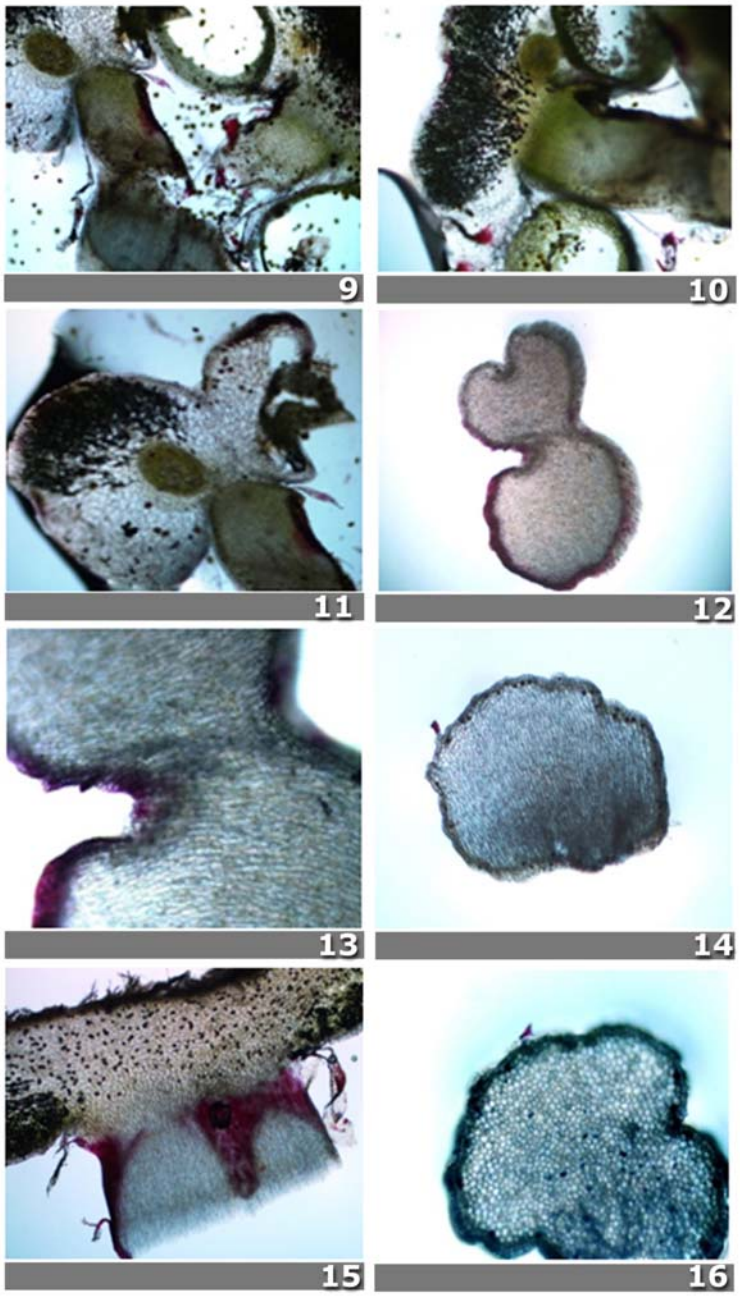

Fig. 9. V.S of receptacle passing through fused lobes and the stalk. Fig. 10. V.S of receptacle passing through the fertile lobes of the hexalobed disc. Fig. 11. V.S of receptacle passing through the trilobed disc at the point of fusion. Note the sterile lobe of the disc. Fig. 12. T.S of the stalk at the dichotomy. Fig. 13. A close view of the cells of the stalk. Fig.14. T.S of the stalk just below the disc where dichotomy ends. Fig. 15. V.S of the thallus passing through the fused stalk, stalks are fused at the point of origin. Fig.16.T.S of the stalk of the fused receptacles.

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