

ON *HEPATICITES KASHMIRIENSIS* SP. NOV. — A FOSSIL MEMBER OF THE HEPATICAE FROM THE KAREWAS OF KASHMIR, INDIA*

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ABSTRACT

One of the samples of a lignitic coal collected from the Nichahom — Handwara area of Kashmir (alt. 6,000'–10,500') on maceration with conc. HCl and 2 per cent alkali released, a few bryophytic specimens also. One of these, *Hepaticites Kashmiriensis*, has been described here. It differs from other species of *Hepaticites* Walton in general plant structure, size of the cells and rhizoids.

INTRODUCTION

The Pleistocene Karewa deposits of Kashmir have always paid good dividends to students of palaeobotany during the last one hundred years. It was Godwin-Austen who made the pioneer contribution in 1859, followed by the valuable additions by Middlemiss (1923) and De Terra (1935). Sahní (1936) and his school of palaeobotany attacked the problem and made further additions to our knowledge of the Karewa fossils. Iyengar and Subramanyam (1943), Puri (1948), and Goswami (1955) have reported fossil algae in the form of diatoms, *Botrydium* and *Scytonema* respectively from the Karewas.

MATERIAL AND METHODS

With a view to study the microflora contents of the deposits, one of us (Goswami) collected lignitic coal samples from the Nichahom — Handwara (6000–10500 ft.) area of Kashmir in 1951. One of the lots of this collection was submitted to bulk-maceration in conc. HCl and 2 per cent NaOH, the usual Schultze solution was found to be too strong for the delicate and brittle material. The specimen of lignite yielded a good number of microfossils in the form of coniferous pollen grains, cuticles, remains of fern sporangia, spores and woods, etc. Goswami (1955–1956, 1956, 1957) has already described a *Scytonema*, a fern sporangium and a coniferous cuticle named *Taxites mehtai*. Out

of this lot, the present note deals with yet another specimen.

DESCRIPTION

The plant body is thalloid, and one cell in thickness. The cells of the thallus are 4–8 sided (FIG. 1) and are flattened. The largest cell measures ca. 8–28 μ . The cellular outlines are perfectly preserved and, as both upper and lower surfaces are represented, two sets of outlines are visible due to oblique pressing. The cell walls are ca. 1–4 μ .



FIG. 1

*The work was carried out in the Palaeobotanical Section of the Department of Botany, Banaras Hindu University, with the help of a research grant awarded by the Scientific Research Committee of the U.P. Government.

in thickness. The marginal cells of the thallus are smaller than the rest of the body-cells, and the outer-walls of these marginal cells are a little convex which support the presumption that the thallus-margin was probably entire. The midrib is absent from all the specimens. The cells of the thallus, which form a somewhat round protuberance at one end, bear a number of rhizoidal structures (?) on the ventral surface. Such cells of the thallus are small and overcrowded, and may be regarded as parent rhizoidal cells. The rhizoids are thread-like, thin, and *ca.* 4.5 μ wide. It is not possible to differentiate whether the rhizoids are unicellular or multicellular.

DISCUSSION

The specimen described above resembles Walton's (1928) form genus *Hepaticites*. He has described five species and out of these, our specimens recall the general features of *H. metzgerioides* except for much longer cells, and the presence of thin, thread-like and *ca.* 4.5 μ wide rhizoids. These differences encourage the authors to give a new specific

name to their *Hepaticites* specimens. The species is named after Kashmir valley from where the lignitic coal, releasing these specimens, was collected.

The comparative distinguishing characters of the different species of *Hepaticites* by Walton (1928), Harris (1942), and Townrow (1959) are given in the appendix, along with our own species.

According to Walton (1928) all these fossil Hepaticae may belong to the Anacrogynae. The vegetative structures available are not sufficient for drawing any definite conclusions as to the affinities of the fossil.

The authors have not come across any published record of fossil-Bryophyta from India and claim it to be the first record from the Karewas of Kashmir.

ACKNOWLEDGEMENT

We are grateful to the U.P. Scientific Research Committee for financial assistance. We are indebted to Prof. J. Walton for helpful suggestions as regards identification, and to Prof. C. A. Arnold for going through the materials.

APPENDIX

SPECIES	NATURE OF PLANT BODY	RHIZOID		
		Present or absent	Nature of wall	Width, μ
1. <i>H. metzgerioides</i> Walton	Thalloid; dorsiventral; wing one cell thick, cells isodiametric, lobing irregular as compared to <i>H. lobatus</i>	Present	Smooth	9
2. <i>H. lobatus</i> Walton	Thalloid; dorsiventral; wing one cell thick, cells elongated	Present unicellular	Smooth	13
3. <i>H. langi</i> Walton	Thalloid; ribbon-shaped; thallus several cells thick, 0.6 mm. wide; plants smaller and slender than <i>H. willsi</i>	Present unicellular	Smooth	13-20
4. <i>H. willsi</i> Walton	Thalloid; ribbon-shaped; thallus several cells thick, isodiametric cells, 0.9 mm. wide	—	—	—
5. <i>H. kidstoni</i> Walton	Dorsiventral; axial region and lobes-rhombic larger and semi-circular smaller	—	—	—
6. <i>H. wonnacotti</i> Harris	Large plant, thalloid; 12 mm. broad, several cells thick; ventral scales absent	Present	—	40
7. <i>H. haiburnensis</i> Harris	Plant larger than <i>H. cyathodoides</i> several cells thick; ventral scales present	—	—	—
8. <i>H. cyathodoides</i> Townrow	Thalloid; forked; two cells thick; cells in rows and elongated	Present thin or thick	Smooth	8
9. <i>H. kashmiriensis</i> Mehta & Goswami	Thalloid; thallus one cell thick, cells much longer than <i>H. Metzgerioides</i>	Present thin	—	4.5

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