

ON THE OCCURRENCE OF A CYANOPHYCEAN MEMBER, *WESTIELLOPSIS*
IN THE DECCAN INTERTRAPPEAN SERIES, M. P., INDIA

N. V. BIRADAR

Botany Department, University of Poona, Poona—411007

ABSTRACT

A well preserved filamentous alga belonging to Cyanophyceae was found attached to the cortical part of a dicot wood which was collected from Mohgaonkalan, Dist. Chhindwara, M. P. India. The alga compares with the living genus *Westiellopsis* Janet and has been named as *Westiellopsis mahabalei* sp. nov.

INTRODUCTION

Occurrence of algal cells, spores and filamentous bodies showing similarities with members of Cyanophyceae have been described from different localities and horizons in India by several authors. GOSWAMI (1955) described false branching in *Scytonema*. GOWDA (1970) showed the presence of structure, like heterocysts and other characters of cyanophycean nature. MEHTA (1954) described *Aphanocapsa* from Permo-Carboniferous beds of South Rewa. From the Tertiary lignites of Bikaner, RAO (1957) reported *Synechocystis*. S. R. N. RAO (1944) reported *Symploca jurassica* from Upper Jurassic of the Cullygoody Limestones of Trichinopoly. SASTRI, VENKATACHALA AND DESIKACHARY (1972) described fossil *Palaeonostoc*.

A specimen was recently collected from Mohgaonkalan, Dist. Chhindwara, M.P., India with well-preserved alga showing both prostrate and erect filaments attached to the cortical tissue of a fossil dicot wood.

DESCRIPTION

Phylum—CYANOPHYTA

Class —CYANOPHYCEAE

Order —STIGONEMATALES

Family —STIGONEMATACEAE

Genus —**Westiellopsis** Janet

Westiellopsis mahabalei sp. nov. (Pl. 1, Figs. 1-2; Text-figs. 1-5)

Diagnosis—Plant body with two types of filaments, consisting of single row of cells showing true branching. The terminal part of certain filaments show multicellular structure appearing as pseudohormocysts. Intercalary heterocyst-like cells present; sheath being absent. Cells of secondary filaments quadrate to oblong. Primary filaments torulose.

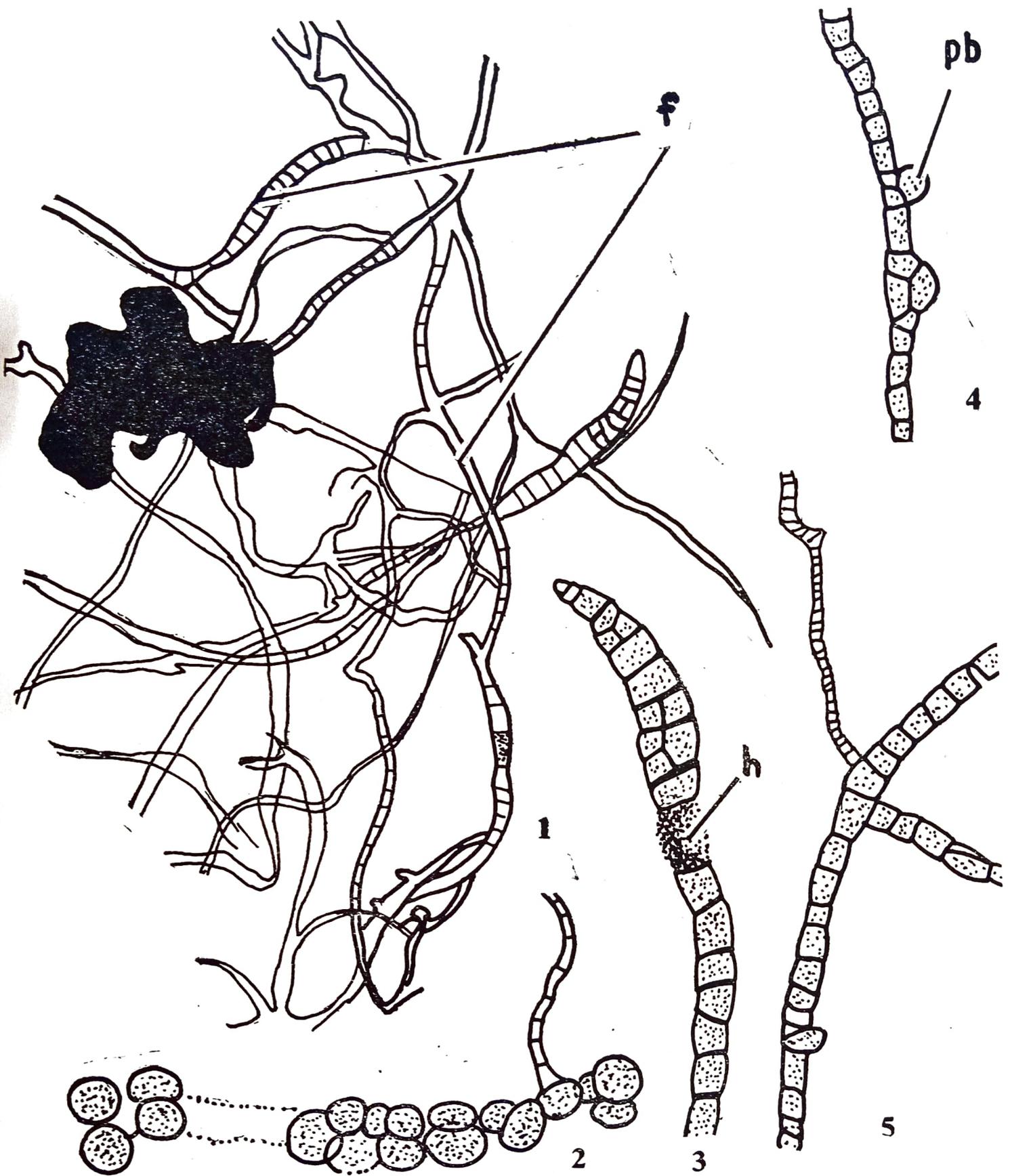
Locality —Mohgaonkalan, Dist. Chhindwara, M.P., India.

Horizon —Deccan Intertrappean Series.

Age —Eocene

Holotype —MK 5/70, Botany Department, University of Poona.

A piece of dicot wood, 7×3 cm was collected from Mohgaonkalan. Transverse sections of fossil wood in various planes showed well-preserved filamentous bodies of blue-green algae growing at various places, some in lumps other as isolated ones at the peripheral part of the cortical tissue (Text-fig. 1; Pl. 1, Fig. 1). Two types of filaments were



Text-figs. 1-5. *Westiellopsis mahabalei* sp. nov., 1. A group of fossil algal filaments—f, growing on the peripheral part of a cortical region of a dicot wood, $\times 495$. 2. Part of a primary (prostrate) filament magnified to show the torulose nature, $\times 1250$. 3. Magnified part of a secondary filament showing multiple tissue formation at the apical end and an intercalary heterocyst-like cell—h, $\times 1250$. 4. A part of secondary filament magnified. Note the protrusions of branches—pb, $\times 1250$. 5. The same, showing well developed true branches, $\times 1250$.

observed, (1) primary or prostrate with more or less torulose cells (Text-fig. 2), each cell measuring $6 \times 6 \mu$, (2) Secondary or aerial branches arising from the primary prostrate body (Text-fig. 2). These filaments are not constricted at the cross walls (Pl. 1, Fig. 2; Text-figs. 3-5). Secondary filaments consist of quadrate to oblong cells. Quadrate cells measure $4 \times 4 \mu$ and oblong or cylindrical cells $8 \times 4 \mu$. Intercalary heterocyst-like cells are seen at certain places (Pl. 1, Fig. 2; Text-fig. 3). The contents of these cells were in the state of disintegration and hence appear as hyaline cells. This may be due to the structural changes during the development of heterocyst. Probably heterocysts in the present specimen might be at old stage and in the form of degeneration. The specimen might have been trapped during the last stage and hence the areas of intercalary heterocysts in the filament are seen as hyaline or empty spaced cells, they are oblong or cylindrical, measuring $10 \times 4 \mu$. Protrusions of branches are seen at a number of places (Text-figs. 4, 5). The nature of branching is true. Branches are formed at some distances, either on one side or on both sides of filament. The secondary filaments are generally uniseriate (single row of cells), but in certain filaments, cells in the apical region divide transversely and longitudinally giving rise to multicellular regions (Pl. 1, Fig. 2; Text-fig. 3) appearing as pseudohormocysts. Filaments are without mucilage sheath.

DISCUSSION

The characters of primary and secondary filaments, true branching and intercalary heterocyst-like cells of the present fossil alga are very much similar to those of *Westiellopsis* Janet and *Hapalosiphon* Näg. Both of them have somewhat similar filamentous nature and intercalary heterocysts (DESIKACHARY, 1959).

The fossil alga shows close resemblance with the genus *Westiellopsis* rather than *Hapalosiphon* in the nature of filament, absence of hormogones and sheath and in formation of multicellular structure at the terminal part of filaments.

The genus *Westiellopsis* Janet is represented in India by three species occurring in garden soils, rice fields and sandy soils (JANET, 1941; JEEJI BAI, 1972). The present species does not agree with the known living species. Hence it is regarded as a new one. It has been named as *Westiellopsis mahabalei* sp. nov., after my teacher Prof. T. S. Mahabale.

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REFERENCES

- DESIKACHARY, T. V. (1959). *Cyanophyta*. ICAR, New Delhi.
- GOSWAMI, S. K. (1955). Occurrence of *Scytonema* sp. in lignite of Kashmir Valley. *Curr. Sci.* **24** : 56.
- GOWDA, S. S. (1970). Fossil blue-green algae and fungi from the Archean complex of Mysore. *Proc. (Abst.) I. Symp. Taxonomy and Biology of Blue-green algae. Madras Univ. Madras.* **8-13** : 40-41.
- JANET, M. (1941). *Westiellopsis prolifica* gen. et sp. nov. a new member of the Stigonemataceae. *Ann. Bot.* **5** : 167-170.
- JEEJI BAI, N. (1972). The genus *Westiellopsis* Janet in *Taxonomy and Biology of Blue Green algae*; ed. T. V. Desikachary, Univ. of Madras, Centre for advanced study in Botany, Madras.
- MEHTA, K. R. (1954). *Aphanocapsa* from Permo-carboniferous beds of Pali in South Rewa. *Palaeobotanist.* **3** : 38-39.
- RAO, A. R. (1957). Algal remains from the Tertiary Lignites of Palana (Eocene), Bikaner. *Curr. Sci.* **26(6)** : 177-178.



RAO, S. R. N. (1944). Upper Jurassic marine algae from Trichinopoly, South India. *Curr. Sci.* **13**(4) 101-102.

SASTRI, V. V., VENKATACHALA, B. S. & DESIKACHARY, T. V. (1972). A fossil Nostocaceae from India. *Taxonomy and Biology of Blue-green algae*; ed. T. V. Desikachary, Univ. of Madras, Centre for advanced Study in Botany, Madras.

EXPLANATION OF PLATE 1

Westiellopsis mahabalei sp. nov.

1. A group of fossil algal filaments growing on the peripheral part of a cortical tissue of a dicot wood, $\times 98$, 2. A part of filaments magnified to show the multiple tissue formation at the apical end in the right hand corner and an intercalary heterocyst-like cells in the filaments of single row of cells, $\times 210$.