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OBSERVATIONS ON A NEW SPECIES OF THE GENUS *DRAPARNALDIA* BORY *D. NIZAMII* SP. NOV. FROM ALLAHABAD[1]

R. N. YADAVA AND D. C. PANDEY

University of Allahabad, Allahabad

ABSTRACT

Draparnaldia nizamii sp. nov. is described from Allahabad (India). The new species has been compared with *D. simplex*. The new taxon has also been compared with a rare genus *Cloniophora*.

INTRODUCTION

Genus, *Draparnaldia* is widely distributed in fresh water reservoirs especially in the temperate regions of the world. In India, its first record was made by Randhawa (1936) and subsequently Shaikh and Vaidya (1972) made the second record. They found *D. plumosa* and *D. acuta* respectively from the northern and western regions of the country. *D. acuta* was again reported by Patel and Vaidya (1972) from Ahmedabad. More recently Tiwari *et al.* (1979) recorded a new species *D. iyengarii* from Rajasthan.

The present alga was collected from a temporary water channel at Handia in Allahabad district August 1975,. It was found growing on the surface of water along with other aquatic plants including *Draparnaldiopsis* sp. and *Aulosira* sp.

OBSERVATION

The thalli were yellow-green in colour and extremely slippery in touch due to secretion of mucilage. Filaments were upto 6 cm. in length and exhibited a branched dendroid habit (Figs. 1 & 2). The main axis of a filament remains distinct, almost uniformaly broad throughout and tapers gradually towards the distal end. It bears long and short laterals. The lateral (Fig. 5) bearing cells are normally smaller than other cells (Fig. 5). Occasionally, however, non-lateral bearing cells were also found to be shorter. The axial cells are barrel-shaped or cylindrical, measure 20-28 μm in breadth and 28-30 μm in length. Cells of the main axis which produce long laterals are also generally smaller than the adjacent cells. They are 16-18 μm in breadth and 24 to 26 μm in length.

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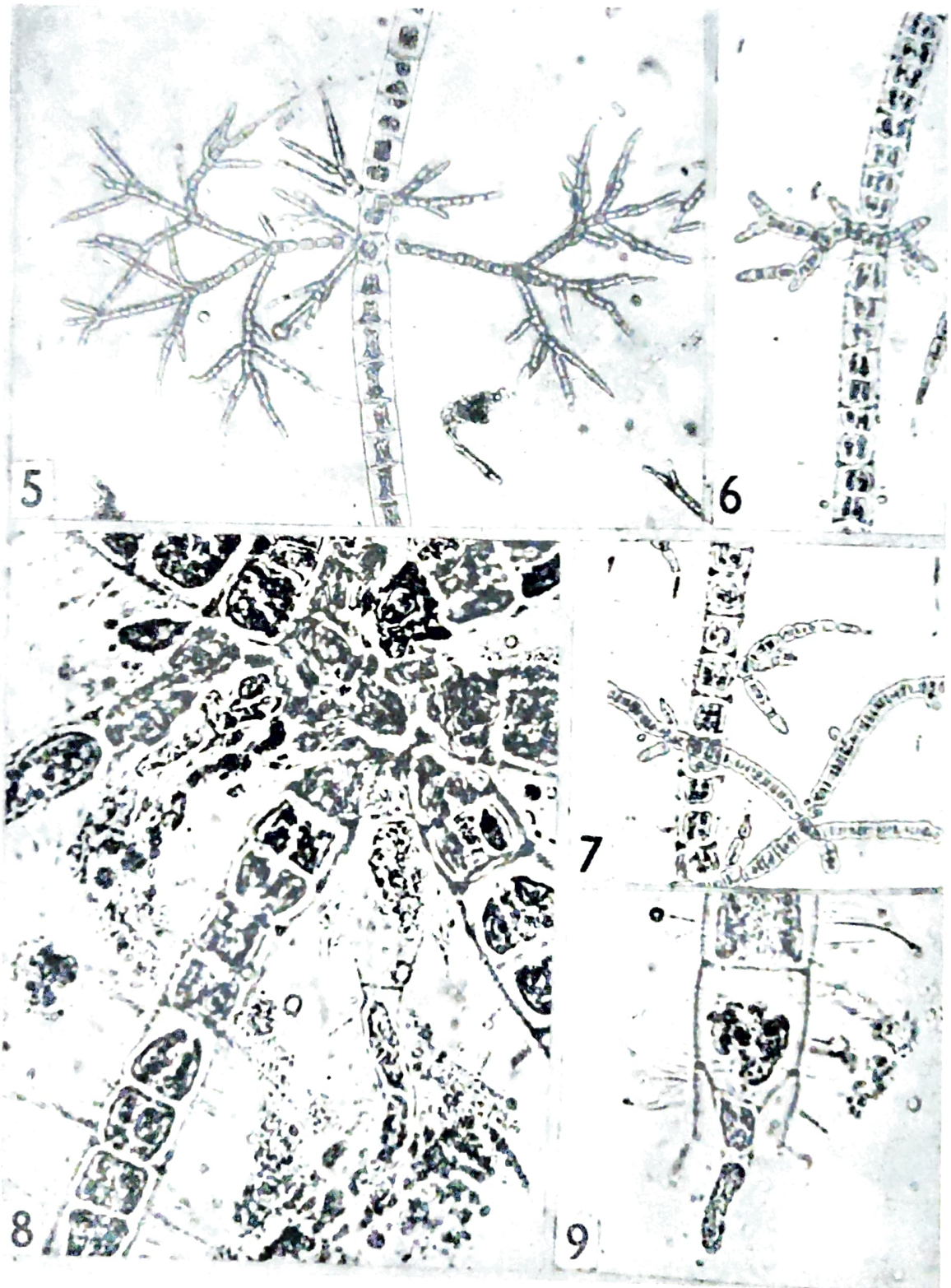

Figs. 5-9 : Fig. 5. Showing disposition of short and long laterals with hair. The laterals are arising from smaller cells of the main axis. Fig. 6 & 7. Showing dichotomy and trichotomy of laterals. Fig. 8. Showing (Main axis) origin of tubular rhizoids from the bases of long laterals. Fig. 9. Origin of branch from the cross wall of the main axis.

lacking in *D. nizamii*. In the present species *D. nizamii* the long and short laterals usually terminate into a long multicellular hair and show a trichothallic growth where as in *Gloniopphora* hairs are absent. The morphology of the attaching rhizoids is also different

The above comparison of *D. nizamii* sp. nov. with *D. simplex* and *Gloniophora* shows that the alga possesses certain characters of its own and its similarities with others are only superficial. Therefore, the present alga has been considered as a new species of *Draparnaldia viz. Draparnaldia nizamii* sp. nov. after Professor J. Nizam, in recognition of his contributions in the field of algal researches in India.

Diagnosis :

D. nizamii sp. nov. : Filaments attached by rhizoids or free-floating up to 6 cm. long, axial cells cylindrical, shorter or quadrate, 20-28 μm broad, 18-24 μm long, chloroplast girdle shaped with 2 to 6 pyrenoids. Lateral branches of two types, short laterals originate just below the septa of the main axis and long laterals arise just below the septa of the main axis, opposite, rarely alternate and each terminates into a long multicellular hair. Cells of the laterals vairable in shape, usually cylindrical, 21-30 μm broad, 24-30 μm long have a chloroplast with one pyrenoid. Rhizoids of two types, one type originates from the septa of the main axis and long laterals and the other type arises from the basal cell of the main axis. Rhizoids are broader near the point of origin and attenuate slowly towards their end.

Type locality : A temporary water-channel at Handia, District Allahabad (August 1975).

Type specimen : The type specimen (D. C. P. 34) has been deposited in the Botany Department, Allahabad University, Allahabad.

Habit : Free floating along wtith other algae.

D. nizamii sp. nov.

Filamenta per rhizoidea affixa aut libere fluitantia, usque ad 6 cm. long. Cellulae axiales cylindricae, breviores quam longae aut quadratae, 20-28 μm lat., a 18-24 μm long. Chloroplasturs cinguliformis, 2 and 4 pyrenoides habens Rami laterales duobus typis constantes: laterales breves admodum infra septa axis principalis oriuntur, atque laterales longi admodum infra septa axis principalis enascuntur, oppositi, raro alternati, omni in pilum multicellularem longum desinente. Cellulae ramorum lateralium forma variantes, plerumque cylindricae, 21-30 μm lat. 24-30 μm long., earum chloroplasto unam pyrenoidem habente. Rhizoidea duobus typis constantia: uno typoe septis axis principalis atque ramorum lateralium longorum oriente, type alio e cellula basali axis principalis enascente. Rhizoidea latiora propa locum origii is et eorum extremitatem versus gradatim attenuantia.

Locus type : Canalis aquae temporalis ad locum Handim, pagum Allahabad dictum. August 1975.

Specimen : (D. C. P. 34) in Departmento Botanico Universitatis Allahabadis, Allahabad depositum.

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Each axial cell possesses a girdle-shaped chloroplast filling almost the entire boundary of cells (Fig. 8). A chloroplast has an entire margin with 3-6 pyrenoids.

The cells of the main axis, which give rise two laterals are some what stretched with angular facets (Fig. 5). In a continuous series, not more than two or three cells of the main axis, give rise to laterals but a well-developed whorl of laterals is borne by only one while other cells may have only one or two laterals. In certain cases the long laterals acquire the same length and breadth as the main axis.

Long laterals always originate from the main axis usually in groups of 4-6 in a whorl or opposite and are rarely alternate (Figs. 2 & 3). The morphology of long laterals is like that of the main axis. Generally long laterals arise just below the septa, rarely from the median position of the cell. Cells of a young long lateral may be upto 16 μm in length and 10 μm in breadth, but mature laterals may be broad upto 30 to 32 μm. Usually the end cell of a long lateral ultimately turns into a long multicellular hair. In mature filaments, at the region of septa, a young branch or rhizoid may originate by further protrusion and extension of cross-walls.

As regards short laterals, they always originate from just below the septa of main axis as well as from the long laterals. But in certain cases short laterals appear to originate from the median region of the cells. The laterals may be opposite or in whorls. Usually, the cells bearing laterals are smaller than the adjacent ones. Short laterals arise as two opposite branches at end of a long lateral (Fig. 5). While in the other, three short laterals could be seen arising from the end cells of a long lateral (Fig. 5). Terminal cells may be attenuated or may end into a long hair. In certain other cases, origin of short laterals from the apices of long laterals presents a look of a dichotomy or trichotomy (Figs. 6 and 7). But the end of a long lateral necessarily terminates into a hair.

The alga was growing attached to substratum by rhizoids. They originate from the basal cell and are usually branched (Fig. 4). Occasionally they arise just below the septa of the main axis and long laterals (Fig. 9). Rhizoids are much broader near the point of origin and attenuate slowly towards their end (Fig. 8). The first cell of a rhizoid is some what swollen having a few traces of the chloroplast. Probably, such a characteristic rhizoids is not recorded in other species of the genus.

DISCUSSION

Among the species of *Draparnaldia* Bory so far recorded (Prescott, 1951 Printe, 1964, and Cook, 1970) *D nizamii* sp. nov. could be compared, to some extent, with *D. simplex*, in the mode of arrangement of laterals and general appearance of thallus. But the present alga is very distinct in having much narrower main axis, short and long laterals usually arising from distinctly smaller axial cells and in the shape of chloroplast as well as in the occurrence of hairs. *D. nizamii* sp. nov. is also superficially comparable with another ill defined Chaetophoralean genus *Cloniophora* (Printz, 1964) in general appearance of thallus, laterals and mucilaginous thalli. But the present alga differs characteristically in the main axis not being dichotomously branched as in *Cloniophora*. Further, in *Cloniophora* short and long laterals are not distinct and there are swollen cells in the axis and these are

Figs. 1-4. : *D. nizamii* sp. nov. Fig. 1. Showing habit of the alga. Fig. 2 & 3 Showing disposition of long and short laterals on the main axis. Fig. 4 Basal attachment system with bifurcated rhizoids.