

# Structural abnormalities in some green algae from north-eastern part of Uttar Pradesh

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Structural abnormalities have been reported in four genera, viz. *Oocystis* Naeg., *Oedogonium* Link, *Euastrum* Ehrenberg and *Cosmarium* Corda ex Ralfs from northern-eastern part of Uttar Pradesh. All the taxa belong to class Chlorophyceae and have been collected from different aquatic habitats of Bahraich district, Uttar Pradesh. These structural changes are either due to deterioration of aquatic habitats or may be due to pathogenic effect of microbes. Abnormal forms of the orders Chlorococcales and Oedogoniales have been reported for the first time from India.

**Key-words**-Freshwater algae, structural abnormalities, Bahraich, Uttar Pradesh.

## INTRODUCTION

BAHRAICH and Gonda districts in north eastern part of Uttar Pradesh show rich algal assemblage in rivers, ponds and lakes (Misra et.al. 2002a, b; Misra & Srivastava 2003). So far, 32 taxa belonging to order Oedogoniales (10), Ulotrichales (11), Cladophorales (4) and Chaetophorales (7) of class Chlorophyceae are reported. Some abnormal algal species have been observed in algal collections of Bahraich district. These abnormalities are in vegetative and reproductive structures. Prasad and Mehrotra (1970), Prasad and Misra (1982) and Bardoloi (1983) have reported abnormal desmids from different parts of the country. Kadlubowska (1998, 2000, 2001) has reported fungal interactions with algae. Fungal infection on Zygnematalean algae, *Spirogyra* Link and *Mougeotia* Agardh destroy cellular protoplasm, thus making the identification of host cell difficult.

## MATERIAL AND METHOD

Algal samples were collected from tributaries of Saryu river at three different sites, viz. Ghingha Ghat, Golua Ghat and Barua Ghat with the help of planktonic mesh net.

Samples were preserved in 4% aqueous solution of formaldehyde and algal forms were stained with iodine and mounted in glycerin for identification at generic level. Photomicrographs were taken with the help of Nikon Labophot II microscope.

## OBSERVATION

Generic identification was done with the help of Prescott (1951), Tiffany and Britton (1952), Philipose (1967) and Prasad and Misra (1992).

**Genus- *Oocystis*** Naegeli in A. Braun 1855

***Oocystis* sp.**

Pl. 1, Fig. 7

Cells with smooth walls in colonies of 2-3 cells, triangular in shape, surrounded by greatly swollen old mother cell wall, cell 60-90  $\mu\text{m}$  long, diameter of colonies 260-300  $\mu\text{m}$ .

*Collection No. & Date*-BAH-10 (5.1.1999).

*Locality*-Ghingha Ghat.

*Remarks*-Morphologically colonies resemble with *Oocystis gigas* Archer, but cell within the colonies differ in shape and size. Triangular shaped autospores differ from oval shaped parent cell which has been observed for the first time. It is a single specimen collected from natural habitat, hence considered as abnormal *Oocystis* sp.

***Oedogonium* sp. 1**

Pl.1, Figs. 1, 2

Macrandrous, dioecious, oogonia 1-8, subvoid-globose operculate, oospore, nearly filling oogonium, spore wall smooth, female vegetative cell 20  $\mu\text{m}$  broad, 60-70  $\mu\text{m}$  long, oogonium 68  $\mu\text{m}$  in diameter, oospore 55  $\mu\text{m}$  in diameter.

*Collection No. & Date*-BAH-52 (12.2.1999).

*Locality*-Barua Ghat.

*Remarks*- Basal portion of oogonium is inflated due to chytridial infection. Present specimen is similar to *O. pringsheimii* Cramer, but male filament of this species are not observed, so it cannot be assigned to this species

### *Oedogonium* sp. 2

Pl. 1, Figs. 4,5

Macrandrous, dioecious, oogonium 1-4, obovoid, to subovoid, oospore ovoid-globose, female vegetative cell 65-68µm broad, 260-275 µm long, oogonium 170 µm in diameter.

*Collection No. & Date*-BAH-14 (5.1.1999)

*Locality*- Ghingha Ghat.

*Remarks*- Vegetative filament transformed in spring like coiling structure (Pl. 1. fig. 5), oogonium contains more than one oospore (abnormal feature-Pl 1, fig. 4). Present taxon is morphologically similar to *Oedogonium rivulare* (Le Clerc) A. Braun, Tiffany and Britton (1952- p. 68) but male filament of this species was not observed so cannot be assigned at specific level.

### *Oedogonium* sp. 3

Pl.1, Fig. 8

Macrandrous, dioecious, oogonium abnormal in shapes, filament above the oogonium are shifted towards the left side from central position, male filament is 45 µm broad, 110-185 µm long. oogonium 110 µm in diameter.

*Collection No. & Date*-BAH-54 (14.2.1999)

*Locality*- Golua Ghat.

*Remarks*- As the female reproductive part has

been totally damaged by pathogen, specific identification is not possible.

### *Oedogonium* sp. 4

Pl.1, Fig. 9

Macrandrous, dioecious, oogonium 1 ovoid, vegetative cell 36-38 µm broad, 150-225 µm long, oogonium 57-58 µm diameter.

*Collection No. & Date*-BAH-64 (14.2.1999)

*Locality*- Golua Ghat.

*Remarks*- Vegetative filament ruptured and wall is dilated at right side, oospores are totally destroyed by pathogen. This taxon is morphologically similar with *O. vaucharii* (Le Clerc) A. Braun but due to lack of anthridia, specific identification is not possible.

### *Genus-Euastrum* Ehrenberg 1832

#### *Euastrum* sp.

Pl.1, Fig.6

Cells broader than long, constriction deep, sinus narrow and open. Each semi cell 5 lobed with rounded angled lateral lobes rotundo-truncate, polar lobe broadly truncate with faint median notch, cell wall with short spines with in polar and lateral lobes. Long cell 80-85 µm, lateral cell 60-65 µm, isthmus 19 µm.

*Collection No. & Date*-BAH-14 (5.1.1999)

*Locality*- Ghingha Ghat.

*Remarks*- Present taxon is morphologically similar with *E. spinulosum* var. *burmense* Krieger but differ in size of semicell. Prasad & Misra (1992) have reported long cell 51-54 µm, lat. cell 43-45 µm. These abnormalities in present specimen may be due to uneven growth of semicell.

## PLATE 1

1. *Oedogonium* sp. 1. x 200
2. *Oedogonium* sp. 1. x 650
3. *Cosmarium* sp. x 200
- 4,5. *Oedogonium* sp. 2 x 500

6. *Euastrum* sp. x 800
7. *Oocystis* sp. x 200
8. *Oedogonium* sp. 3 x 200
9. *Oedogonium* sp. 4 x 200



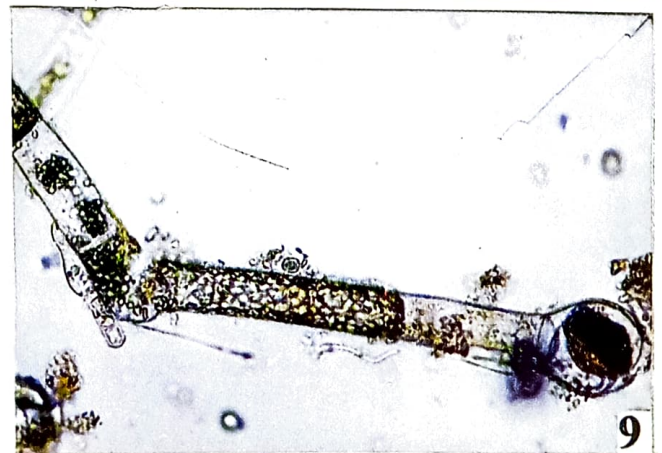
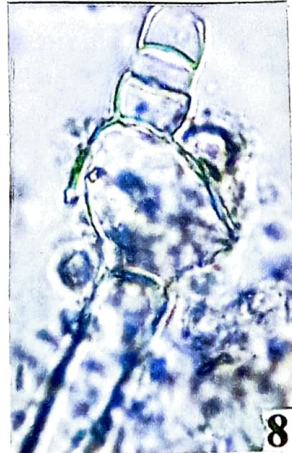
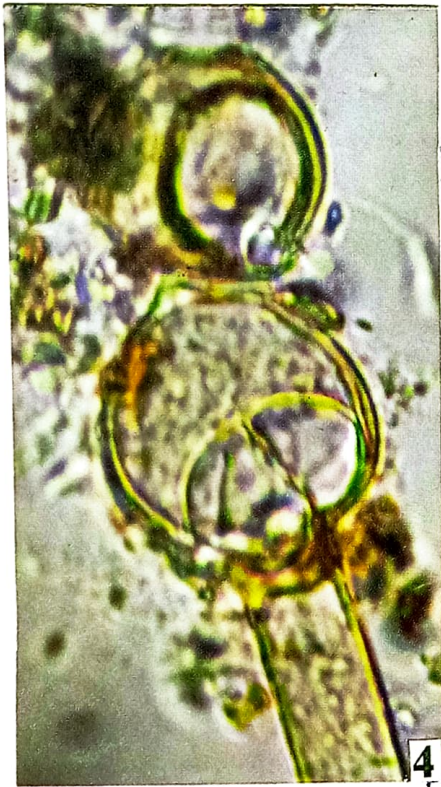
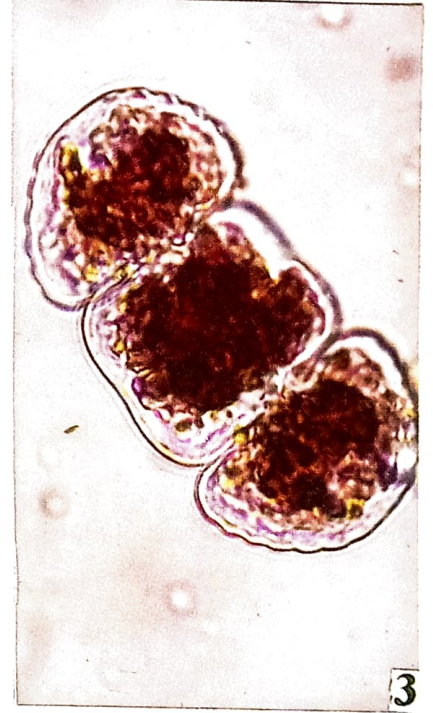
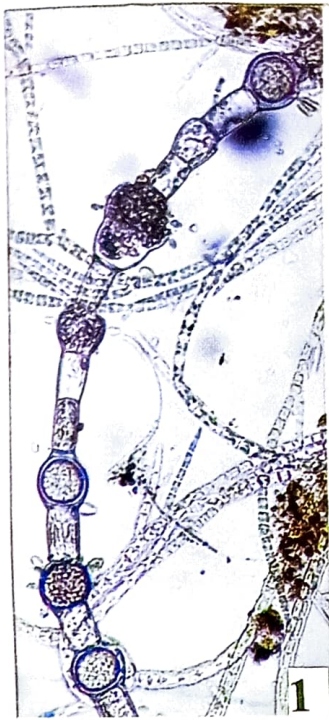


PLATE 1



**Genus-*Cosmarium* Corda ex Ralfs 1848*****Cosmarium* sp.**

Pl.1, Fig.3

Cell medium size, broader than long, deeply constricted sinus linear and open, semicells sub-semicircular to subpyramidate cell wall coarsely punctate lat. cell 40-42  $\mu\text{m}$ .

*Collection No. & Date*-BAH-51 (12.1.1999)

*Locality*- Golua Ghat.

*Remarks*- Present taxon is similar to *C. lundellii* Delp but due to inhibition of cell division, specific identification is not possible. Infection at the time of cell division might have affected the semicells.

Algal flora is disturbed with change in physico-chemical nature of aquatic habitats. The microbial infection on algae is of serious concern and requires a detailed study. Algal abnormalities are still under investigation. Records of abnormal *Oedogonium* Link are being reported for the first time. Algal abnormalities may be either due to infection by pathogen or due to deterioration of habitats.

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