



Research article

## Two species of *Zygnemopsis* (Skuja) Transeau from West Bengal, India

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**Abstract:** In the present paper, two species of the genus *Zygnemopsis* viz. *Zygnemopsis pseudolahaulensis* and *Zygnemopsis benghalensis* of Zygnemaceae under the order Zygnematales of Chlorophyta had been morpho-taxonomically described first time from Hooghly district in West Bengal, India. These algal species had been collected from ponds of this district. The above mentioned two taxa were new reports from the district and also the second report from state of West Bengal, India.

**Keywords:** New report - Chlorophyta - *Zygnemopsis* - Hooghly district - West Bengal.

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### INTRODUCTION

The members of Zygnemaceae are filamentous and prefer to grow in winter season and, form climax in early summer season. Finally they form zygospores or aplanospores during reproductive phase in summer as free floating condition. *Zygnemopsis* (Skuja) Transeau, contains about 55 species all over the world and all the known species are isogamous (Yin-xin 1994). Previously, few works had also been described the members of Zygnemaceae from the state and country. Martens (1869) first recorded the occurrence of Zygnemaceae from Raniganj area of West Bengal. In the year 1959, a commendable taxonomic work had been carried out by Randhawa on the members of Zygnemaceae and he published his findings in the monograph 'Zygnemaceae' from India. Some other noteworthy publications on *Zygnemopsis* included: Das (1962), Patel & Kumar (1971, 1977), Prasad & Kumari Vijay (1977), Sharma & Kargupta (1986) and Chalotra *et al.* (2013). As since 1986 no morpho-taxonomic report on *Zygnemopsis* was found from West Bengal, keeping view this paucity of taxonomic information the present study was undertaken from this area. The aim of the present study was the exploration of biodiversity of Zygnemaceae and documentation of green filamentous algal species to prepare algal data bases of this state in future. Human anthropogenic activities, loss of algal habitats and increase of pollution level in water bodies might be responsible for rare occurrence of this alga in this state. Therefore, a proper sustainable management is required for functioning aquatic ecosystems and maintains biodiversity of phyco-flora.

### MATERIALS AND METHODS

Algal samples were collected in plastic and glass containers from two places viz. ponds at Jirat (N 23°-12' E 88°-45') and Somrabazar (N 23°-13' E 88°-43') of Hooghly district, West Bengal. Detail study was made by examining specimens under Olympus microscope (Model-CH20i) for determination of species. Samples were preserved in 4% formalin. Identification of different taxa was accomplished with the help of authentic literatures viz. Randhawa (1959), Patel & Kumar (1971, 1977) and Sharma & Kargupta (1986). Each currently accepted name has been provided with its author(s) name. Water temperature (°C) was recorded using Zeal's (U.K.) Mercury thermometer on the spot. pH of water was measured with the help of portable digital pH meter (Merck, Germany, Model No. 320). NO<sub>3</sub>-N, PO<sub>4</sub><sup>3-</sup>, dissolve oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), SO<sub>4</sub><sup>2-</sup>, total soluble salts (TSS), total dissolve solids (TDS) and total alkalinity were measured by using UV-VIS spectrophotometer (CECIL CE- 7200) according to the method of APHA (2005). All parameters in ecological notes were expressed in mg l<sup>-1</sup> except pH and temperature (°C).

## RESULTS AND DISCUSSIONS

A total number of two algal species of the genus *Zygnemopsis* (Skuja) Transeau, 1934 viz. *Zygnemopsis pseudolahaulensis* Sarma & Kargupta and *Zygnemopsis benghalensis* Sarma & Kargupta of Zygnemaceae under the order Zygnematales of Chlorophyta had been morpho-taxonomically described first time from Hooghly district in West Bengal, India.

### Morpho-taxonomic description

Order: Zygnematales

Family: Zygnemaceae

1. *Zygnemopsis pseudolahaulensis* Sarma & Kargupta in *Hydrobiologia* 139:249, figs. 1-16, 1986 (**Fig. 1A**)

Free floating, greenish-brown, vegetative cells 15.2 to 17.2  $\mu\text{m}$  broad and 54.2  $\mu\text{m}$  to 76.2  $\mu\text{m}$  long; chloroplasts two, nearly rounded; pyrenoid single in each cell; zygospores not formed; aplanospores get swollen and filled with pectic-cellulose materials; ovoid to sub-globose and almost filling the sporangium laterally; 20.0 to 25.0  $\mu\text{m}$  broad and 29.0 to 33.0  $\mu\text{m}$  long and, brown; outer spore wall smooth, thin and median spore wall wrinkled or with wavy corrugations.

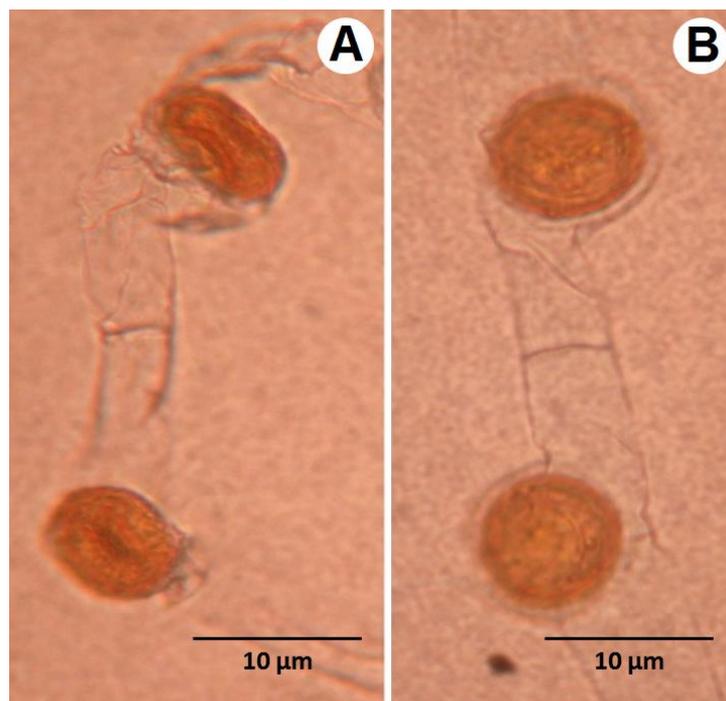
**Habitat:** Pond water at Jirat.

**Collection No:** 1001; **Dated:** 29.02.2011

**Ecological Notes:** Jirat, water temperature: 21°C; pH: 7.6;  $\text{NO}_3\text{-N}$ : 0.20;  $\text{PO}_4^{3-}$ : 0.32; DO: 6.4; BOD: 4.8; COD: 110.0;  $\text{SO}_4^{2-}$ : 6.0; TSS: 110.0; TDS: 162.0; Total alkalinity: 128.0

**Occurrence:** Rare

**Significance:** Primary producer in aquatic bodies.



**Figure 1.** A, *Zygnemopsis pseudolahaulensis* Sarma & Kargupta; B, *Zygnemopsis benghalensis* Sarma & Kargupta.

2. *Zygnemopsis benghalensis* Sarma & Kargupta in *Hydrobiologia* 139: 247, figs. 1-11, 1986 (**Fig. 1B**)

Free floating, greenish-brown, vegetative cells 11.5 to 21.5  $\mu\text{m}$  broad and 40.5  $\mu\text{m}$  to 96.5  $\mu\text{m}$  long; chloroplasts two and stellate; pyrenoid single in each cell; zygospores not formed; aplanospores get swollen and filled with pectic-cellulose materials; ovoid to cylindrical ovoid and almost filling the sporangium laterally; 16.0 to 31.2  $\mu\text{m}$  broad and 33.2 to 35.0  $\mu\text{m}$  long and, brown; outer spore wall smooth and median spore wall irregularly slightly wavy.

**Habitat:** Pond water at Somrabazar.

**Collection No:** 1003; **Dated:** 29.02.2011

**Ecological Notes:** Somrabazar, water temperature: 21°C; pH: 7.4;  $\text{NO}_3\text{-N}$ : 0.15;  $\text{PO}_4^{3-}$ : 0.28; DO: 6.6; BOD: 4.8; COD: 120.0;  $\text{SO}_4^{2-}$ : 6.4; TSS: 98.0; TDS: 156.0; Total alkalinity: 132.0

**Occurrence:** Rare

**Significance:** Primary producer in aquatic bodies.

Reporting new species from any area as new record or recollecting the species have its own importance in floristic works (Singh *et al.* 2014, Srivastava *et al.* 2014). Das (1962) described a new species of *Zygnemopsis* *Z. queense* from Calcutta. Patel & Kumar (1971) made observation on morphological and cytological characteristics of *Zygnemopsis godwardense* sp. nov. from Gujarat and followed by earlier work they (1977) also recorded three new species of *Zygnemopsis* viz. *Z. chohanensis*, *Z. dharampurensis* and *Z. tricarinata* while studying of Zygnemataceae from Gujarat, India. Prasad & Kumari Vijay (1977) identified a new species of *Zygnemopsis* as *Z. vermaii* from India. Sharma & Kargupta (1986) first described three species of *Zygnemopsis* viz. *Zygnemopsis benghalensis* sp. nov., *Zygnemopsis pseudolahaulensis* sp. nov. and *Zygnemopsis scorbiculata* sp. nov. from West Bengal, India. Chalotra *et al.* (2013) made morpho-taxonomic studies on this genus occurring in fresh water bodies in Jammu and Kashmir and reported three species namely *Z. splendens*, *Z. tiffaniana* and *Z. minuta* which were new to algal taxonomy of Jammu. Apart from the above mentioned studies, it was the second report since its original description by Sarma & Kargupta (1986) from Birbhum district, West Bengal, India. This study might be helpful to explore diversity and occurrence of these species in aquatic ecosystems.

The morpho-taxonomic study of two species of *Zygnemopsis* viz. *Zygnemopsis pseudolahaulensis* and *Zygnemopsis benghalensis* under the order Zygnematales of Chlorophyta will be provided valuable taxonomic information in respect of systematic position, author citation, description, habitat, collection number along with dates, ecological note, significance and occurrence for the first time from this area.

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