



Contribution to the Algal Flora (Chlorophyceae) of Semkhor Borail Wildlife Sanctuary Dima Hasao, Assam, India

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Abstract

The present communication is a part of survey being conducted to study the fresh water algal flora of Samkhor, under Borail Wildlife Sanctuary, Dima Hasao District, Assam. Thirteen taxa of class Chlorophyceae, which include 8 genera, 10 species and 3 varieties, were identified from 6 samples. *Spirogyra nitida* (Dillw.) Link, *Netrium digitus* (Ehr.) Itzigs. and Roth. and *Scenedesmus bijugatus* (Turp.) Kuetz. were the dominant green algae followed by the remaining other rare species of *Scenedesmus* and *Staurastrum*. All these taxa constitute new records for the study area.

Key words: Chlorophyceae, Fresh water algae, Samkhor, Borail Wildlife Sanctuary, Dima Hasao.

Introduction

The contribution to the North Indian Chlorophycean flora have been made by Kant and Anand (1978), Habib (1996, 1997), Habib and Chaturvedi (1999), Singh and Gupta (2000), Suseela and Dwivedi (2001), and Misra *et al.* (2002, 2005). However, the morpho-taxonomic studies of Eastern Himalayan green algal flora have received very little attention (Das 1961; Santra and Adhya 1973, 1976; Alfred 1978).

Algal floral account of Borail Wildlife Sanctuary, Dima Hasao District, Assam is lacking in the literature. As far as the authors are aware, few reports on fresh water algal flora of Meghalaya, (Bisya and Buruah 2001, Hazarika and Misra 1987).

The present report is a part of survey being conducted to explore the fresh water algal flora of Semkhor which is situated at an altitude of 890-950 msl in Southern Assam. It shows varied topography and micro-climatic conditions that provide a congenial environment for rich growth of fresh water algae. During the multidisciplinary expedition of Borail Wildlife Sanctuary, Dima Hasao District, Assam, the present survey was carried out at Semkhor and its surrounding areas of different environments.

Materials and Methods

Fresh water algal samples were collected in the month of April 2001 from several localities in and around Samkhor, under Borail Wildlife Sanctuary, Dima Hasao District, Assam. These samples were preserved in 4% formaline and deposited at Phycology laboratory of National Botanical Research Institute, Lucknow. During microscopic observations, camera lucida diagrams were drawn and identified up to species level following the keys given by Prescott (1951), Tiffany and Britton (1952), Randhawa (1959), Philipose (1967), Prasad and Misra (1992), Kant and Gupta (1998) etc. The result of morpho-taxonomic studies, with description of each taxon, their collection number and locality and date of collection were given.

Systematic Description

1. *Scenedesmus arcuatus* Lemm. (Fig. 6) Cells 12-13.5 µm long, 6-6.2 µm broad, ovoid or angular, arranged in a double row, forming a curved coenobium with small interstices between cells; cell wall smooth, without spines.

Location: Saline stream at Semkhor.

Collection number: AFS –DH : 0101.

2. *Scenedesmus bijugatus* (Turp.) Kuetz. (Fig. 9) Colonies slightly curved, 2-4 cells arranged in a single linear series; cells 12.5 μm long, 6.8 μm broad, ellipsoid to ovoid with ends broadly rounded.

Locality: A pond in Jaluwa near Semkhor.

Collection number: AFS–DH : 0132.

3. *Ulothrix zonata* (Web. and Moh.) Kuetz. (Fig. 7) Vegetative cells 43.8 μm long, 46.9 μm broad, cylindrical or slightly swollen; cell wall thick; chloroplast band shaped, covering mid region with several pyrenoids.

Locality: Water springs at Semkhorma .

Collection number: AFS–DH : 0121.

4. *Cladophora glomerata* (Linn.) Kuetz. (Fig. 8) Filaments usually with profuse, y-shaped lateral branching; vegetative cells of main axis 175 μm long, 45 μm broad and of branchlets 180.5 μm long, 35.8 μm broad with thick stratified walls, multinucleate; plant mass light green.

Locality: A pond near Saline well at Semkhor.

Collection number: AFS–DH : 0145.

5. *Spirogyra nitida* (Dillw.) Link (Fig. 5) Vegetative cells 110-150 μm long, 65 μm broad with plane end walls; chloroplasts 4 with 3-5 turns; conjugation scalariform, tubes formed by both gametangia; zygospores 75 μm long, 45-48 μm broad, cylindric ellipsoid with sharply rounded poles; spore wall smooth, minutely grooved.

Locality: Under a cliff with dripping water at Semdikhor

Collection number: AFS–DH : 0151.

6. *Spirogyra rhizobrachialis* Jao (Fig. 13) Vegetative cells 120-132.5 μm long, 46.5 μm broad with plane end walls; chloroplast 4, slightly spiraled, deeply toothed on the margins, making 3-6 turns; conjugation scalariform, tubes formed by both gametangia; zygospores 75-80 μm long, 38-40 μm broad, ellipsoid; spore wall irregularly and coarsely reticulate, brown.

Locality: Under a cliff with dripping water at Semdikhor

Collection number: AFS–DH : 0176.

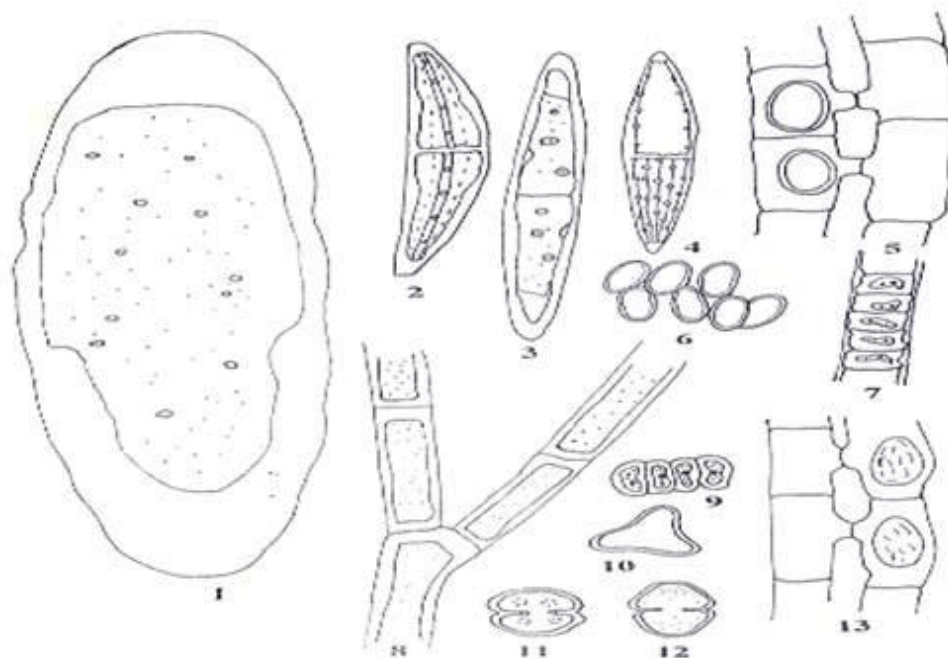
7. *Netrium digitus* (Ehr.) Itzigs. and Roth. (Fig. 1)

Cells 196-197.2 μm long, 48.5 μm broad, fusiform without median constriction; cell wall smooth without pores, margin convex, attenuated gradually from the middle to truncate apices; apices 32.8 μm wide; chloroplast with longitudinal ridges with serrated margin.

Locality: Water spring at Semkhorma.

Collection number: AFS–DH : 0108..

Remark: The specimen observed here was similar to Tiffany and Britton (1952) but wider than the specimen described by Prasad and Misra (1992) from Andaman and Nicobar Islands (Cells 41-44.5 μm broad and apices 15-16.5 μm).



Figures: 1. *Netrium digitus* (Ehr.) Itzigs. and Roth. 2. *Closterium tumidum* Johns. 3. *Closterium acerosum* Ehr. var. *elongatum* Breb. 4. *Closterium lunula* var. *massartii* (Muell.) Nitzs. 5. *Spirogyra nitida* (Dillw.) Link 6. *Scenedesmus arcuatus* Lemm. 7. *Ulothrix zonata* (Web. and Moh.) Kuetz. 8. *Cladophora glomerata* (Linn.) Kuetz. 9. *Scenedesmus bijugatus* (Turp.) Kuetz. 10. *Staurastrum pachyrhynchum* Nordst. 11. *Cosmarium lundellii* Delp. var. *ellipticum* West and West 12. *Cosmarium pseudogranatum* var. *rotundatum* (Krieg.) Messik. 13. *Spirogyra rhizobrachiialis* Jao

8. *Closterium acerosum* Ehr. var. *elongatum* Breb. (Fig. 3)

Cells 455-460 μm long, 50 μm broad, slightly curved, narrowly fusiform with outer margin slightly curved and inner margin almost straight, gradually tapering to the narrow and often slightly thickened, rounded truncate apices, apex 4 μm wide; cell wall smooth, colourless with or without a median girdle; chloroplast without ridges, pyrenoids 3-4 in a median series.

Locality: Water spring at Semkhorma.

Collection number: AFS–DH: 0110.

Remark: The dimensions of the present specimen differ from Prasad and Misra (1992) described from Andaman and Nicobar Islands (Cells 750-870 μm long, 37-41.5 μm broad).

9. *Closterium lunula* var. *massartii* (Muell.) Nitzs. (Fig. 4)

Cells 335 μm long, 50 μm broad, about 5-6 times longer than broad, almost straight, outer margin more or less curved, inner margin slightly tumid in the middle, gradually and gently attenuated to slightly truncate apices, apex 15 μm wide; cell wall smooth; chloroplast with 5 ridges and numerous scattered pyrenoids.

Locality: Saline stream at Semkhor.

Collection number: AFS–DH: 0111

Remark: The present specimen is much shorter than the Prasad and Misra (1992) specimen described from Andaman and Nicobar Islands (cells 738 μm long, 109 μm broad).

10. *Closterium tumidum* Johns. (Fig. 2)

Cells 84 μm long, 13.5 μm broad, curved, gradually attenuated towards slightly truncate rounded apices, apex 3-4 μm wide; cell wall smooth; chloroplast with 4 ridges and 3-4 pyrenoids arranged in a row.

Locality: Water spring at Semkhorma.

Collection number: AFS–DH: 0114

11. *Cosmarium lundellii* Delp. var. *ellipticum* West and West (Fig. 11)

Cells 70 μm long, 50-52 μm broad, deeply constricted with linear sinus; semicells sub- semicircular to sub-pyramidate with rounded angles; isthmus 8 μm wide; cell wall coarsely punctuate; chloroplast axile with two pyrenoids in each semicell.

Locality: Water spring at Semkhorma.

Collection number: AFS–DH : 0116

Remark: The present specimen is larger than the specimen described by Kant and Gupta (1998) from Ladakh (Cells 51-54 μm long, 43-45 μm broad) but its isthmus is much narrower (Isthmus 15-16 μm wide).

12. *Cosmarium pseudogranatum* var. *rotundatum* (Krieg.) Messik. (Fig. 12)

Cells 21.2 μm long, 16.5 μm broad; semicells broadly truncate exhibiting rather prominently convex side and truncate-rounded apex cell wall minutely punctate; isthmus 4 μm wide.

Locality: Saline stream at Semkhor.

Collection number: AFS–DH : 0117.

13. *Staurastrum pachyrhynchum* Nordst. (Fig.10)

Cells 16.8 μm long, 15.2 μm broad, deeply constricted, sinus open and acute angled; semicells sub-elliptic, dorsal margin strongly convex, thickened angles, obtusely rounded and produced with a faint upward tilt; top view triangular showing convex sides; cell wall smooth.

Locality: Saline stream at Semkhor.

Collection number: AFS–DH : 0120

Results and Discussion

Samkhor, under Borail Wildlife Sanctuary, Eastern part of Dima Hasao district of Assam falls under the tropical to subtropical hilly region. Due to low land area water stagnation is a common phenomenon, which supports the luxuriant growth of algae. Out of 13 taxa of class Chlorophyceae, 3 species of *Closterium*, 2 species of *Cosmarium*, *Scenedesmus* and *Spirogyra* (with fertile parts), and 2 species each of *Netrium*, *Ulothrix*, *Cladophora* and *Staurastrum* have been reported in this communication. Morpho-taxonomic variation was observed in the Borail Wildlife Sanctuary, Dima Hasao District, Assam algal flora with that of rest part of Indian algal flora. This variation may be due to the high altitude, low temperature and other climatic and ecological conditions of the locality.

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