

ON SOME DESMIDS FROM KOLAYAT LAKE, BIKANER (RAJASTHAN)

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ABSTRACT : The present communication deals with the taxonomic enumeration of 15 taxa of Desmidiaceae belonging to 5 genera from arid region of Rajasthan. Taxa include (the number in parentheses indicates the number of species) *Closterium* (5), *Cosmarium* (5), *Euastrum* (1), *Staurastrum* (3) and *Tetmemorus* (1). The collections have been made during 2006-07 from Kolayat lake, Bikaner.

Key words : *Desmids*, *Kolayat lake*, *Taxonomy*.

INTRODUCTION

Kolayat lake, Kolayat (27°50' N Latitude and 73°57' E Longitude) is situated about 55 km from Bikaner city in the south-west. It is a holy place of great significance not only in this part but throughout India. Kapil Muni, the propounder of Sankhya Darshan of Hindu Philosophy performed penance here. So, the lake is also named Kapil Sarowar. Many temples stand on the bank of the lake and 52 neat bathing ghats have been built around it, shaded by many trees, adorning the bank of the lake. It is an oasis amidst the vast expanse of arid desert.

The desmids belonging to order Zygnematales are mainly fresh water algae. Their cells are composed of two halves interrupted by pores through which mucilaginous substances are secreted. The cell wall also consists of two layers, surrounded by a gelatinous sheath. Our knowledge of Indian Desmidiaceae is mainly through the work of Suxena and Venkateshwarlu (1966,1968) from Kashmir and Andhra Pradesh respectively; Patel (1969) from Gujarat; Agarkar (1971) from Gwalior (M.P.); Agarkar and Agarkar (1973) from Panchmarhi (M.P.), Prasad and Mehrotra (1977) from North India; Pandey and Pandey (1980) from Allahabad; Suxena (1983) from South India; Misra and Srivastava (2003) from north-eastern Uttar Pradesh; Dwivedi *et al.* (2004) from Uttar Pradesh; Dwivedi *et al.* (2009) from Himachal Pradesh. Earlier, only few workers have done work on fresh water algae including desmids from Bikaner region (Soni & Bhardwaj,1988 and Gehlot *et al.*,2003). In the present study, fifteen taxa of desmids have been identified from Kolayat lake, Bikaner.

MATERIAL AND METHODS

Algal samples were collected from different sites of the Kolayat Lake, randomly during July 2006 to June 2007. The samples were preserved in 4% formalin and slides were prepared by using different stains. Detailed studies were made by examining specimens under a NIKON-Japan trinocular research microscope (Model OPTIHOT-2) attached with NIKON-FX-35DX camera and camera-lucida drawing were used for the study of morphology of algal material.

RESULTS AND DISCUSSION

Systematic Enumeration and Description :

Class : Chlorophyceae

Order : Zygnematales

Family : Desmidiaceae

Genus : *Closterium* Nitzsch ex Ralfs

***Closterium acerosum* (Schroeder) Ehr.**

Cells fusiform, variable in size, apices rounded, curvature 28°-35° of arc, cell wall finely striate, yellowish brown, ridged chloroplast with 6-7 pyrenoids (Fig.1).

Cell : 25-35µ broad, 250-390µ long

***Closterium dinae* Ehr.**

Cells 16-18 times longer than broad, strongly curved, 115 μ -125 μ arc, apices tapering to obliquely truncate, cell wall smooth, chloroplast with 11-15 pyrenoids (Fig.2).

Cell : 25-30 μ broad, 300-360 μ long

***Closterium ehrenbergii* Meneghini ex Ralfs**

Cells stout and large, strongly curved, 120°-145° of arc, slightly bulging at mid-region, dorsal margin broadly convex, wall smooth, chloroplast with many scattered pyrenoids (Fig.3).

Cell : 45-65 μ broad, 290-400 μ long

***Closterium leibleinii* Kutzing**

Cells curved with rounded ends, 8-9 times longer than broad, 150°-165° arc, slightly tumid in the mid-region, cell-wall smooth (Fig.4).

Cell : 17-32 μ broad, 110-215 μ long

***Closterium lanceolatum* Kutz.**

Cells elongate, median constriction absent, attenuated at the poles, cell wall with delicate pores, hyaline cytoplasmic region at each pole, conspicuous vacuole with gypsum particles in axial series (Fig.5).

Cell : 41.65 μ broad, 107.80 μ long

Genus: *Tetmemorus* Ralfs***Tetmemorus brebissonii* (Meneghini) Ralfs**

Cells cylindrical to subfusiform, deep isthmus with open sinus. Apical portion of a semicell is somewhat compressed, chloroplast single, axial with 8 to 10 longitudinal radiating plates, pyrenoids numerous (Fig.6).

Cell : 14.85 μ broad, 92.4 μ long

Genus : *Cosmarium* Corda***Cosmarium granatum* Breb.**

Cells generally twice longer than wide, median constriction deep, sinus deep and closed, opening to the isthmus; semi cells with truncate apex, cell wall smooth and finely punctate, chloroplast with one pyrenoid (Fig.7).

Cell : 12-16 μ broad, 27-31 μ long

***Cosmarium laeve* Rabenhorst**

Cells small with sub rectangular semi cells, isthmus 6-8 μ m (Fig.8).

Cell : 16.5-18.5 μ broad, 21-26 μ long

***Cosmarium lundellii* var. *ellipticum* West and West**

Semi cell broadly elliptical, isthmus narrowly open, wall finely punctate, isthmus 16-18 μ m (Fig.9).

Cell : 48-53 μ broad, 62-65 μ long

***Cosmarium reniforme* (Ralfs) Arch.**

Cells up to 1.3 times longer than wide, sinus deeply open in isthmus to slightly closed outside, semi cells reniform, superior margin truncate, cell wall granulate, chloroplast with two pyrenoids (Fig.10).

Cell : 49-67.5 μ broad, 41.2-53 μ long

***Cosmarium botrytis* var. *depressum* W. and G. S. West.**

Cells 2 times longer than broad, median constriction deep, sinus very narrow, semi cells semicircular and more depressed at poles, chloroplast 5-6 ridged, cell wall smooth and with undulating margins, isthmus 16-22 μ m (Fig.11).

Cell : 32-42 μ broad, 72-95 μ long

Genus : *Staurastrum* Meyen***Staurastrum elongatum* Barker**

Semi cells quadrangular, single axial chloroplast, deeply incised lobe, simple to emerginate spines, cell wall smooth or ornamented with granules, denticulation on wall (Fig.12).

Cell : 45.5 μ broad, 48.5 μ long

***Staurastrum bieneanum* Rabenh.**

Semi cells with triradiate ridge, sinus opened, wall punctate, isthmus 5.5-6.5µm (Fig.13).
Cell : 27.5-29µ broad, 24-29µ long

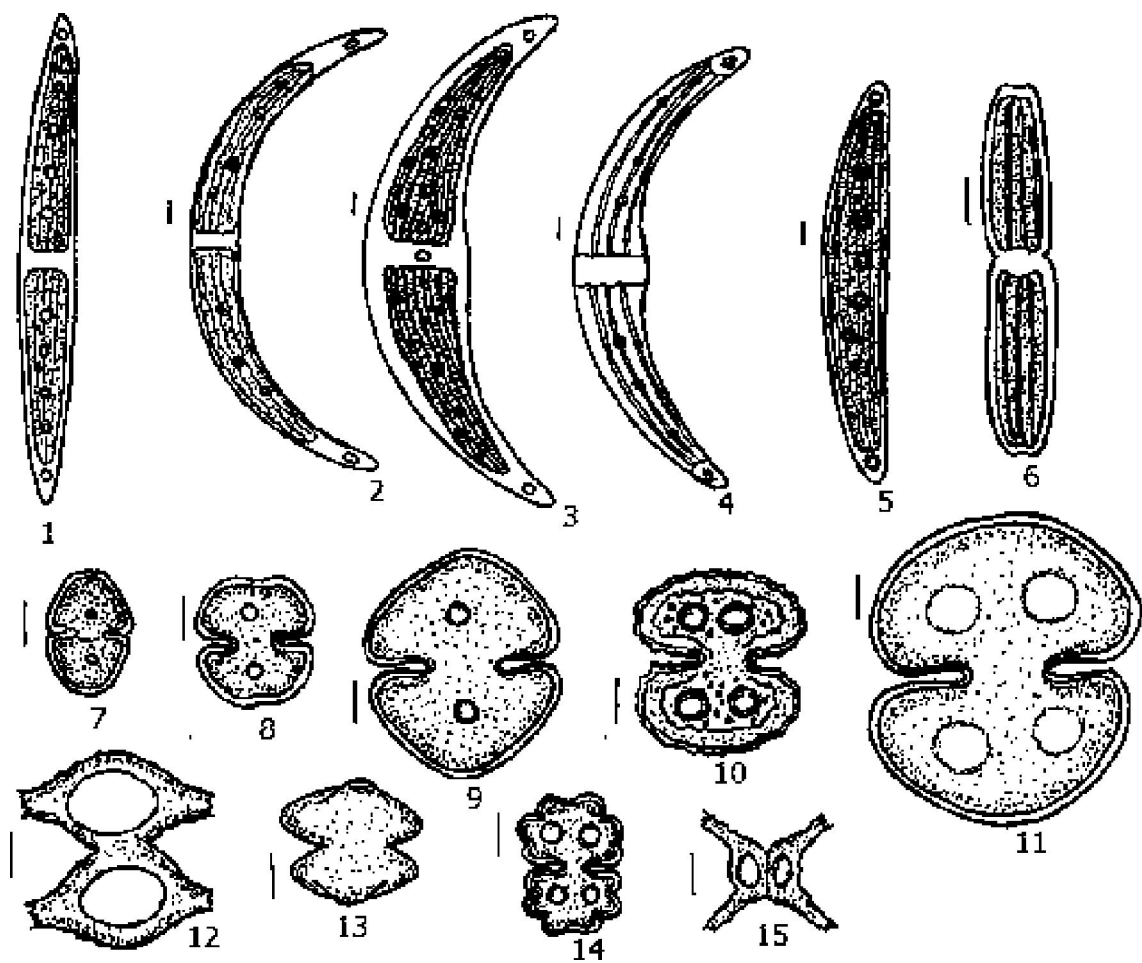
***Staurastrum natator* var. *crassum* W. and G. S. West.**

Cells strongly compressed and bilaterally symmetrical, cell wall ornamented with granules, semi-cells cyathiform, superior angles of semi-cells terminate in truncate ends with short divergent spines, single chloroplast in each semi-cells (Fig.15).
Cell : 18-22.5µ broad, 15-20.4µ long

Genus : *Euastrum* Ehrenberg

***Euastrum ansatum* (Ehrenb) Ralf.**

Cells length double from width, compressed, deeply constricted isthmus, linear to emerginating incision at the apex, two broadly rounded lobes at each margins, one or more protuberances on the front face (Fig.14).
Cell : 16-25µ broad, 25-30µ long.



Figs. 1-15 (1) *Closterium acerosum* (Schroeder) Ehr. (2) *Closterium dinae* Ehr. (3) *Closterium ehrenbergii* Meneghini ex Ralfs (4) *Closterium leibleinii* Kütz. (5) *Closterium lanceolatum* Kütz. (6) *Tetmemorus brebissonii* (Meneghini) Ralfs (7) *Cosmarium granatum* Breb. (8) *Cosmarium laeve* Rabenhorst (9) *Cosmarium lundellii* var. *ellipticum* West & West (10) *Cosmarium reniforme* (Ralfs) Arch. (11) *Cosmarium botrytis* var. *depressum* W. and G. S. West. (12) *Staurastrum elongatum* Barker (13) *Staurastrum bieneanum* Rabenh. (14) *Euastrum ansatum* (Ehrenb) Ralf. (15) *Staurastrum natator* var. *crassum* W. and G. S. West.

* Scale denotes to 10 µm

REFERENCES

- Agarkar, D. S. (1971). *Phykos.*, **10** : 54-69.
- Agarkar, D. S. and Agarkar, M. S. (1973). *Hydrobiol.*, **54** : 23-32.
- Dwivedi, S.; Mishra, P. K. and Susheela, M. R. (2004). *Phytotaxonomy*, **4** : 64-73.
- Dwivedi, R. K.; Shukla, C. P.; Mishra, P. K.; Shukla, S. K. and Seth, M. K. (2009). *Feddes Reportium*, **120(3-4)** : 236-249.
- Gehlot, R. K.; Mali, M. C. and Kachhawa, G. M. (2003). *Oikoassay*, **16(2)** : 79-82.
- Misra, P. K. and Srivastava, A. K. (2003). *J. Indian Bot. Soc.*, **82(1-4)** : 85-92.
- Pandey, U. G. and Pandey, D. C. (1980). *J. India Bot. Soc.*, **59** : 246-250.
- Patel, R. J. (1969). *J. Bombay Nat. Hist. Soc.*, **66** : 414-419.
- Prasad, B. N. and Mehrotra, R. K. (1977). *New Botanist.*, **4** : 49-74.
- Soni, K. C. and Bhardwaj, T. N. (1988). *Oikoassay*, **5(1)** : 7-10.
- Suxena, M. R. (1983). *Phycologia*, **66** : 43-99.
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