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Some New Desmid Taxa Reported from Gajner Lake Bikaner Rajasthan (India)

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Rohitash
Research Scholar,
Dept. of Botany,
Govt. Dungar College,
Bikaner, Rajasthan, India

M.C.Mali
Associate Professor
Botany
Dept. of College Education,
Govt. of Rajasthan, India

Abstract

In an aquatic ecosystem Phytoplanktonic community dominated by Algae. Alga are the photosynthetic producers which accounts approx. one third of total photosynthetic activity on this planet. Our study dealswith a fresh water lake ecosystem.Chlorophyceae, Cyanophyceae, Bacillariophyceae are dominant position occupying Algal classes in any fresh water ecosystem. Present paper deals with taxonomical and morphometrical detail of Some algal taxa belongs to Conjugales order of Chlorophyceae class. Gajner lake was selected for our study which located around 33 kms from Bikaner. Study was carried out for one year Jan 2017 to Dec 2017.We collected samples from 3 sites of Gajner lake twice in a month. Gajner lake is a part of wild life sanctuary, managed properly so lessly polluted. Due to trophic level of lake Chlorophyceae class alga profoundly present in lake.Present paper deals with taxonomical and morphometrical detail of Some algal taxa belongs to Conjugales order of Chlorophyceae class.We reported 21 species of non filamentousConjugales (Desmids) during Gajner Lake study.

Keywords: Desmids, Phytoplanktons, Gajnerlake, Morphometry Taxonomy.

Introduction

Gajner Lake is an artificial rainfed lake that is several decade old.It is a part of wild life sanctuary. Lake located 33 kms toward west from Bikaner district Headquartes.It encompassing 27.94 N Latitude and 73.05 E Longitude in view of Geophycial location. It is located 33 kms aparts from Bikaner towards west. We were collected our sample from different sites of lake twice in a month from January 2017 to December 2017.Conjugales order of Chlorophyceae class comprises numerous type of algal genera having different type of thallus. Among them non filamentous form regarded as desmids.In thalloid shape of these desmids two semi cells connected by isthmus are present.Morphometerical enumeration is the only way to denote the diversity of these alga thoughout various seasons in aquatic environment. Most of these species occurs as epiphyte on the Macrophytes of lake serve as potent producers for aquatic fauna.

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Review of Literature

Iyenger (1941) explored desmid diversity from south india. A lot of contribution was made by Bhandhari (1952) in field of algal Flora of Rajasthan. Later on a very conceived elaboration on phytoplanktonic diversity of Udaipur District (Rajasthan)was givern by Vyas and H D Kumar (1968). Phytoplanktonic diversity studied by numerous workers (Agarkar 1979; Bharti 1982; Prsad 1992; Habib 2001; Malik 2006) Bhardwas and Sony (1980,1988) illustrated phytoplanktonic flora from Rajsthan. MaliMC (2002), Mali MC and Gehlot (2003) extensively studied Phycology of Bikaner city reprensenting an arid climate in Rajasthan.The Elaboration were tokensetted in Roadmap of Phytoplanktonic study.Keshri (2012,2013,2017) studied desmid Biota from West Bengal. Later on Mali,MC and Santosh (2016) illustrated Algal flora from Kodemdesar and Kalyan sagar Pond of Bikaner District Rajasthan. Mali MC and Modi (2010) Elaborated the account of Algal Biodiversity from a Famous religious Site Kolayat (Bikaner). Mali & Rohitash (2017.2018) explored Phytoplanktonic Flora of Gajner Lake ,Bikaner (Rajasthan).

Material and Methods

The samples were collected from different sites of lake during 9 am to 12 pm twice in a month. Algae were analyzed in living condition with the help of light microscope. Because during preservation many of characters are lost. Thats why analysis in living condition favoured. After analysis of samples algae were obeserved in 4% formalin solution. Morphometrical study was done by using De winter research microscope having scale in micrometer measurement. Taxonmical enumeration was done by The structure and reproduction of algae (F.E Fritsch), Manual of phycology (G Smith), Algae a review (G W Prescot).

Objective of Study

Rajasthn that carries an unique identity by imprinting an image of water scarcity ,extreme arid climate .Thus a study of water body in an arid zone regarding its trophic concern is automatically become keynote criterion. Phytoplanktonic diversity can be programed directly to conclude about water quality for its uses in multiple type of purpose. Ecophysiological concern of a water body reflected directly in growth of specific Phytoplanktonic species diversity.Thus by scaling phytoplanktonic diversity it become easy to denote the status of a lake regarding its uses.Gajner lake was selected for our study because it is a part of sanctuary that's why by concerning numerous birds fauna who are feeding directly on this lake it become worthy .

Result and Discussion

Taxonomic and Morphometric enumeration of reported Taxa

Class: Chlorophyceae
Order: Zygnematales
Family: Desmidiaceae

Genus: Closterium abruptum W. West

Cell curved with tapering ends 9-10 time longer than broad. 160- 165˚arc, semi cells with two pyrenoid in middle girdle of chloroplast Wall smooth Cell: 9.0-10.5µ broad &75-90 µlong (Fig 1)

Genus. 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
Cell: 25-35µ broad &250-390µ long (Fig2)

Genus: 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 µbroad &290-400 µlong

Genus: Cosmarium conttactum Kirchner

Cells solitary, longer than broad, sinus deeply constricted, widely open, semicells circular with big central round pyrenoid cell wall smooth, isthmus 5-8µ broad
cell :25-30 µ broad & 35-40 µ long(FIG 4)

Genus: Cosmarium impressulum Elfving

Cells longer than broad, deeply constricted, sinus narrowly linear, semi-cells vertically sub-quadrate with tri- undulate margin, undulation sub- acute, apex narrow and rounded angles, cell wall smooth, top view broadly elliptic, chloroplast parietal, isthmus 13-17 µ broad.
Cell : 17-20 µ broad &20-25 µ long (FIG 5)

Genus: Cosmarium subcirculareTurner

Cell outline circular .each semi cell hemispherical .side view circular.sinus deep narrowly linear, dialated at the extremity.Isthmus 27-29 µwide.
Cell: 68-70 µ long& 60-62 µ wide (FIG 6)

Genus: Cosmarium granatum Brebisson
Semi cells truncate pyramidal .chloroplast one in each semi cell with a pyrenoid.cell wall smooth
Cell: 26-31µ long&19-23µ broad.Isthmus: 4.9-7 µ wide (FIG 7)

Genus: Cosmarium excavetum Nordst

Cells two times longer than broad; semicells subcircular, convex apex hyaline and granulate cell wall, granules arranged in 4–5 vertical series in frontal view; shallow median constriction, semicircular median sinus, rounded end; axial chloroplasts with two pyrenoids per semicell.
Cell: 22.1 µ long &12.6 µ broad.Isthmus : 8.2µ(FIG8)

Genus: Cosmarium monoliforme Turpin

Cells small, globose; semi-cells united by a small neck, cell wall smooth.

Cell: 25.2-26.2µ long&14.8-15.6 µ broad.Isthmus: 13.3-15.9 µ wide (FIG 9)

Genus: Cosmarium pachydermum Lundell

over all shape broadly oval; semi-cells hemispherical; cell-wall 2.5-3.0 µm thick with coarsely punctate surface; each cell with two chloroplasts and prominent pyrenoids

Cell: 109-114µ long&83.2-88.7µ broad.Isthmus: 36-39.5 µ wide (FIG 10)

Genus: Cosmarium quadrum Lundell

Cells large, almost as long as broad; constriction deep, sinus closed with dilated ends; semi-cells rectangular with rounded edges; cell wall densely granulate with large blunt granules.

Cell: 28.5-38.3 µ long&28.9-38.3 µ broad.Isthmus: 9.2-12.2 µ wide (FIG 11)

Genus: Cosmarium regnelli Eichler & Gutwinski

Cells rather small, a little longer than broad deeply constricted, sinus narrow with slightly dilated extremity; semicells sub hexagonal, basal angles more or less sub rectangular, sides parallel, upper angles broad and oblique apex truncate and straight.

Cell: 11.6-12 µ long &9.1-10.7 µ broadIsthmus: 2.9-4µ wide (FIG 12)

Genus: Cosmarium maragaritiferum Meneghini ex Ralf

Cell wall punctate .semi cell pyramidical trunctate. basal and upper angle rounded.dialted at extremity.chloroplast two in each semi cell with single pyrenoid.

Cell:49-58µ long &39-46 µ broa. Isthmus: 13-17 µ wide (FIG 13)

Genus: Cosmarium leave Rabenhorst

Cell small deeply constricted. Semi cell oblong elliptical with basal angle slightly round. chloroplast axile with a central pyrenoid.

Semi cell : 25.5-26.5 µ long &19-20µ broad Isthmus : 13-14µ broad (FIG 14)

Genus: Cosmarium psuedorestum F. Ducell

Apical and lateral angle rounded,basal angle rather sharp.semi cell are latterly elliptical.cell wall irregular punctate.

Semi cell: 23-24µ long&19-20 µ broad.Isthmus : 5-6 µ wide (FIG 15)

Genus: Cosmarium punctulatum Breb.

Cells 1.1 times longer than broad; semicells oblong-trapeziform, lower angles rounded, apex broadly truncate, in lateral view semicells circular, in vertical view cell elliptic; cell wall granulate, granules solid; median constriction very deep, sinus closed; chloroplasts with one pyrenoid per semicell.

Cell: 15.0-28.1 µ long&21.0 -25.6 µ broad.Isthmus: 7.0-8.4 µ wide(FIG 16)

Genus: Cosmarium isthmochondrum Nordstedt

Median constriction deep.semi cell with rounded angle.lateral margin convex with a pair of more prominent crenulation on either side of semi cell.

Cell: 25.5-29.5 µ long& 20.7-23.2 µ broad Isthmus: 6.4-7.9 µ wide(FIG 17)

Genus: Staurastrum Identatum West & West

Cells with undulate margins, two processes on each pole of semi cells, isthmus 6.5-7µ. cell: 43.5-48µ broad &32.5-37.0µ long (FIG 18)

Genus: Staurastrum furcatum (Ehr.) Breb.

Semicells cup shaped, wall striated , the specimen is slightly broader than the type. Isthmus 9.5-10.5µ

Cell: 33.5-34 µ long (with process) &1.0-27.0 µ long (without process) ,25-30 µ broad (FIG 19)

Genus: Pleurotaenium coronatum (Breb.) Rabenh.

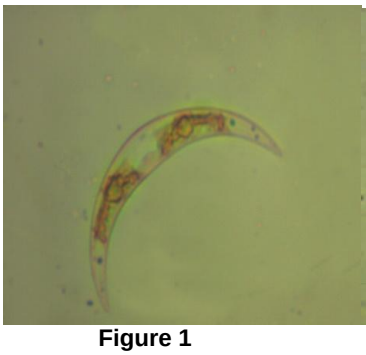
Cells narrow, about 11-12 times longer than wide, 470-490 mm long, 41-42.5 µ wide at middle and 29-30 µ at apex.

Cell: 470-490 µ long (FIG 20)

Genus: Euastrum insulare (Wittr.) Roy

Isthmus deep 3-4 µwide.

Cell :12-14 µ broad& 20-25 µ long (FIG 21)



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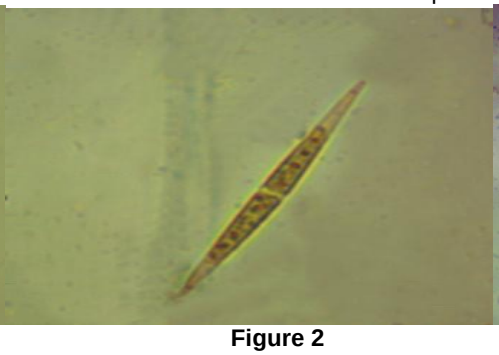

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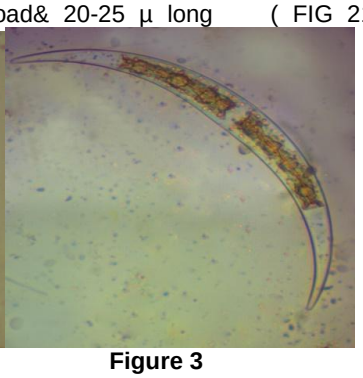

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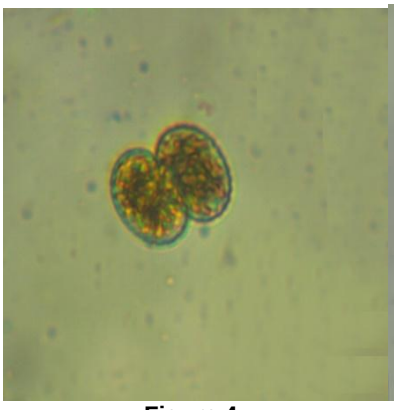

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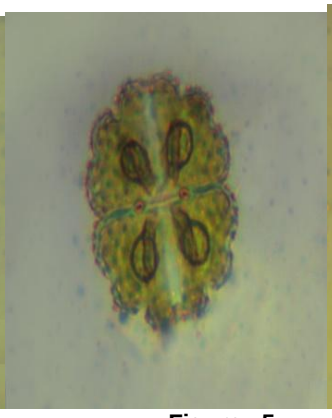

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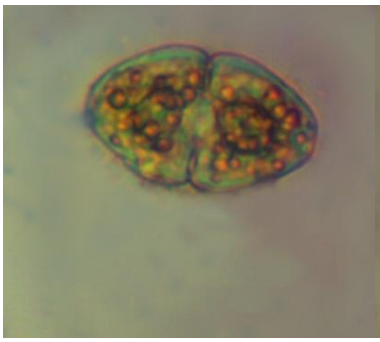

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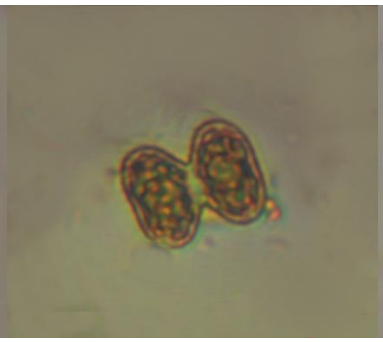

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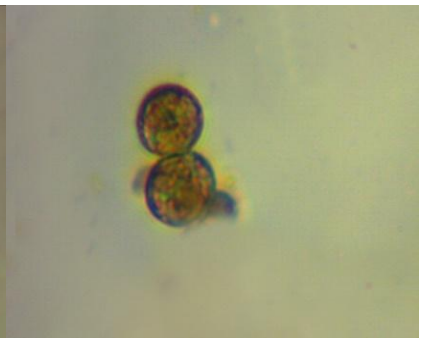

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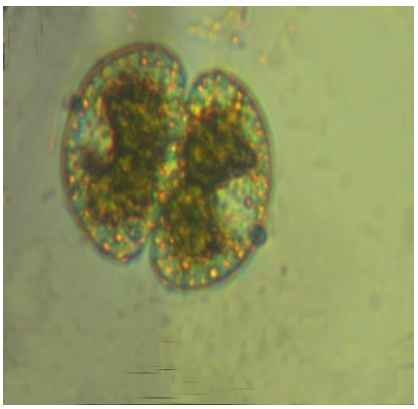

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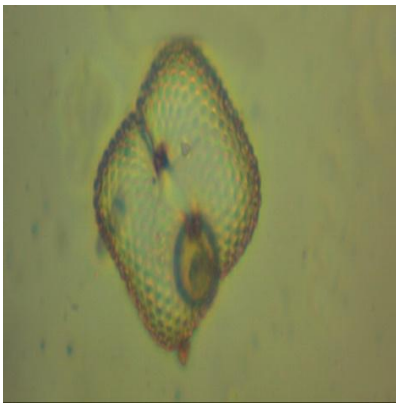

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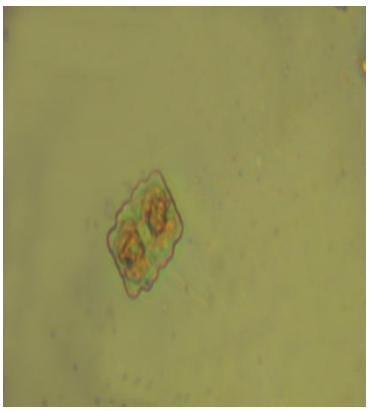

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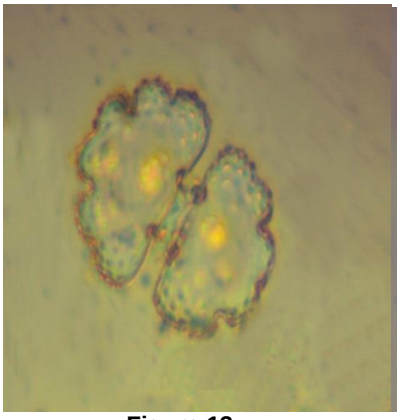
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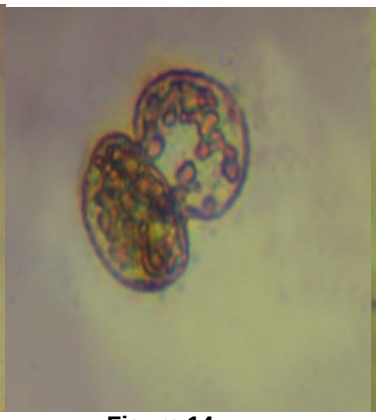
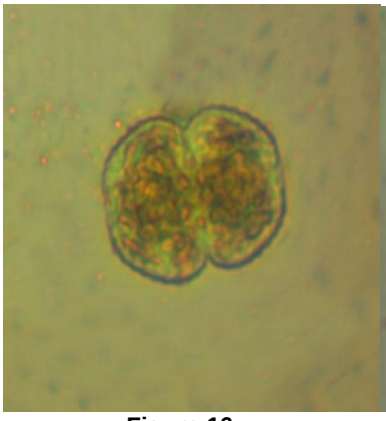


Figure 14


Figure 15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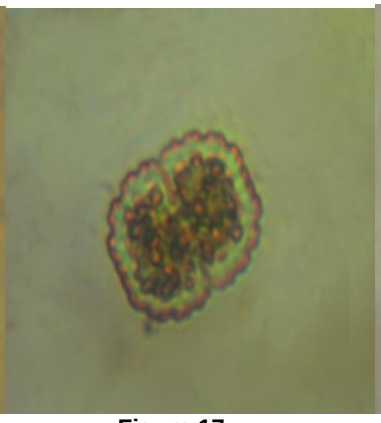
Figure 17

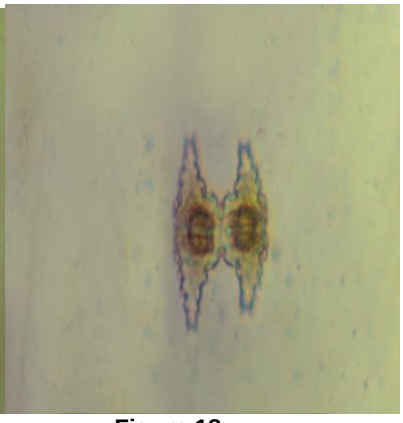
Figure 18


Figure 19


Figure 20


Figure 21

Mostly species of Cosmarium genera profoundly observed during winter seasons. Genus Pleurotenium observed during late summer .Although minor density of all Cosmarium species present throughout the year of study. During winter density increased later on in mid of summer lesser density of Cosmarium observed. Genus Closterium species density were abundant during monsoon season. During the rain fall when run of surface material in to lake occurred Closterium were in profound density.Density of Euastrum genera increased during late summer further decrease during the winter season.Cosmariumquadrum species Observed in plenty during high temperature in Mid Of June.

Conclusion

During the complete study Period Chlorophycean Alga were dominating ,it confer regarding lake trophic level, it is on hypo-trophic scale. Some time tourist deposited waste material on location that time only diversity of diatom and blue green alga enhanced .Due to the rainy fall off Bloom observed during monsoon season only .Rest all the time Green alga were dominating which were not imparting in permanent bloom formation . So pollution level of lake is not so critical .Dense population of desmid genera certifying the conclusion .

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