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Research Article

Periodical Analysis of Few Unicellular Phytoplanktonic Taxa Along with one Filamentous Alga (*Prasiola*; A New Citation to Bikaner Phycological Flora*)* Reported from Gajner Lake, Bikaner

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ABSTRACT

In limnological studies Phytoplanktons are the primary considerations.Algae which are freely percolated with mean of water current are considered as phytoplanktons.All algae are not considered as phytoplanktons like Chara, Nitella these are the macroscopic Alga which grows profoundly in any fresh water bodies carrying suaitable ecophysiological environment to them. Algae are the photosynthetic producers which accounts approx. one third of total photosynthetic activity on this planet. Our study deals with a freshwater lake ecosystem. In limnology of a lake we found dominance of algal genera belongs to Chlorophyceae, Bacillariophyceae, Cyanophyceae Class. However, Euglenophyceae class may present but its population depend upon trophic status of Lake. Present paper deals with periodical analysis of few unicellular phytoplanktons and one filamentous genera Prasiola which is a new citation to Bikaner Phycology. Gajner lake was selected for our study which located around 33 kms away from Bikaner toward west side. Study was carried out for one year January 2017 to December 2017.We collected samples from 3 sites of Gajner lake twice in a month. Now Gajner Lake is the part of wildlife sanctuary. A historical tourist site Gajner palace also located along with lake. So, it is less polluted. Due to trophic level of lake Chlorophycean alga profoundly present in the lake. Although a portion of Lake is under village panchayat which is openly accessed by the local people of Gajner village. The open access site of lake has totally different phytoplanktonic density.

Keywords: *Phytoplanktons, Unicellular, Gajner lake, Periodical analysis, One new citation.*

INTRODUCTION

Bikaner district is the key note region of the Rajasthan representing typical climatology of this arid state. Beside the crucial scarcity of water surprisingly Bikaner has a privilege of some temporary and permanent pond Like Harsholav, Devikund Sagar, Sanso lav, Shiv Bari, Kolayat, Gajner. (Mali, 2002).

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These all ponds were the potent source of drinking water in ancient time and bear the religious values also. Now a days IGNP Project become the lifeline for water need of Bikaner district. (Santosh, 2017). Gajner lake is an artificial rainfed lake. The Maharaja Ganga Singh ruling that time boring this lake along their hunting site. It is a part of Gajner wildlife sanctuary. Lake retain water throughout the year. It is located 33 kms from Bikaner towards west. We collected our sample from different sites of lake twice in a month from January 2017 to December 2017. We also collected the water sample to assess the hydrochemistry of Lake. Morphometrical enumeration is the only way to denote the diversity of algae during the various seasons of study period. Most of these species occurs as epiphyte on the Macrophytes of lake serve as potent producers for aquatic fauna. Study of phytoplanktonic population of a water body is the potent indicator of quality of water. In India limnological study token settled by Iyengar (1941). Later, prominent work done by Anatani (1947a), Desikachary, (1959), Agarkar, (1965). In Rajasthan phytoplanktonic study pioneered by Vyas and Kumar (1968). Then after limnological study get accelerated by several phycologists namely. Mali, M. C. (2002), Barupal (2010) Bhusan and Kumar (2013) Kasthuri et al. (2016), Santosh (2017), Rohitash (2018), Agarwal, Teena (2019), Basumatry, (2020) are namely prominent workers in field of Algal studies.

Site of Lake toward Gajner Palace

Openly access site toward Gajner village.

MATERIALS AND METHODS

The samples were collected from different sites of lake during 9 am to 12 pm twice in a month. Algae were analysed in living condition with the help of light microscope. Because during preservation many of characters are lost. Thats why analysis in living condition preferred. After analysis of samples algae were preserved in 4% formalin solution. Along with algal sample water sample were also collected. water sample analysed for detection of numerous physico-chemical parameters. Study of Interaction of numerous physico-chemical parameters is the prima facing need to understand about the potent presence of particular algal species diversity in the lake. Due to microscopical morphology and rapid multiplication rate algae frequently respond against a minor fluctuation in the hydrochemistry of lake. Morphometrical study was done by using De winter research microscope. Microphotography also carried out for future taxonomical studies. Taxonomical enumeration was done with the concerned literature like the structure and reproduction of algae Vol I (F. E Fritsch), Manual of phycology (G. M. Smith), Algae a review (G. W. Prescot). and various other monograph and research works.

RESULT AND DISCUSSION

Periodical analysis, taxonomy, morphometry of Reported concerned taxa is discussed below.

Class: Chlorophyceae

Order: Volvocales

Family: Chalamydomonadaceae

Genus: *Chlamydomonas sp.* Ehrenberg

Hemispherical unicellular. Motile, two equal flagella on anterior end. Thin cell wall, with or without anterior papilla, cup shape chloroplast. One or more pyrenoids. cells :8-10 µ diameter. (Fig 1)

Order: Chlorococcales

Family: Characeaceae

Genus: *Characium anophelesi* Iyenger, MOP et Iyenger

Cell pear shaped, squat or elongated broadly rounded at the top and narrowed gradually into a round base, attached to substratum by round pad of mucilage. Cell: 22-30 µ broad, 41-48 µlong (Fig 2)

Family: Chlorococcaeae

Genus: *Chlorococcum infusionum (*Schrank) Meneghini

Cells spherical to ellipsoid. Sometimes aggregated as colony in a gelatinous sheath. Cell wall smooth, chloroplast at periphery having numerous pyrenoids. Contractile vacuole absent. uninucleate condition. Cell :2.2-8.5 µ broad. (Fig 3)

Family: Chlorellaceae

Genus: *Chlorella vulgaris* Beijerinck

Free living unicellular algae. Spherical cell having thin membrane. Cup shape parietal chloroplast. Single indistinct pyrenoid. Cell: 9.8µ broad. (Fig 4)

Family: Oocystaceae

Genus: *Dactylococcus infusionum* Nageli, C.

Solitary cells. Sometime aggregated in mucilaginous sheath. Cells are elongated ellipsoidal. Smooth cell wall. Peripheral chloroplast. Cells :4-5µ broad (Fig 5)

Order: Prasiolales

Family: Prasiolaceae

Genus: *Prasiola maxicana* C. Aagrdh

Vegetative cell oval to square. Attach to substratum by elongated obovate cell making holdfast. Cell bear stellate chloroplast. Cell: 8.3-18.7 µ broad (Fig 6)

Class: Euglenophyceae

Order: Euglenales

Family: Euglenaceae

Genus: *Euglena ehrenberghii* Klebs

Cells cylindrical, Round at both end but slightly narrower anteriorly. Pellicle spiral striated. many chloroplasts. Disc shaped. Paramylon grains one or two, rod shaped Cell: 19-34 µ broad, 166-185µ long (Fig 7)

Genus*: Euglena acus* Ehren

Cells elongated, cylindrical, narrowed interiorly with truncate, apex rounded, Posterior side gradually narrowed to a pointed cauds. Pellicle spirally striated. many chloroplasts. Cell: 15.8-70 µ Broad, 45-53µ long (Fig 8)

Genus: Euglena *gracilis* Klebs

Cells immobilized palmella stage. Numerous chloroplasts. Disc shape body eventually distributed throughout the cell. With pyrenoids. Paramylon Bodies absent Cell: 10-15 µ broad, 15-18 µ long (Fig 9)

Genus: *Phacus sp.* Dujardin

Cells ovoid to broadly rounded with lateral notch on one side, anterior end broadly rounded. Posterior end tapers into a short-bent tail.2 paramylon, disc shaped. Pellicle striated. Cell: 34 µ broad, 39 µ long (Fig 10).

Sr.NO.	Phytoplankton taxa	Class	Month in which profoundly present	Mximum Density Date
1	*Chlamydomonas sp.*	Chlorophyceae	Feb., March, Nov. Dec.	17 December,13 February
2	*Characium anophelesi*	Chlorophyceae	Jan., Feb, Nov., Dec.	14 Jan.,28 Dec.
3	*Chlorococcum infusionum*	Chlorophyceae	Nov., Dec.	17 November
4	*Chlorella vulgaris*	Chlorophyceae	Nov., Dec	28 November
5	*Dactylococcus infusionum*	Chlorophyceae	April, May	18 April
6	*Prasiola maxicana*	Chlorophyceae	Jan., Dec.	28 January
7	*Euglena ehrenberghii*	Euglenophyceae	Nov., Dec.	17 December
8	*Euglena acus*	Euglenophyceae	Nov., Dec.	17 December
9	Euglena *gracilis*	Euglenophyceae	Nov., Dec.	28 November
10	*Phacus sp*	Euglenophyceae	Nov., Dec.	17 November

Fig. 1

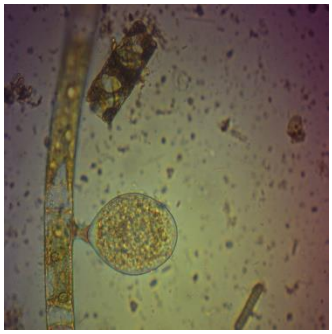

Fig. 2

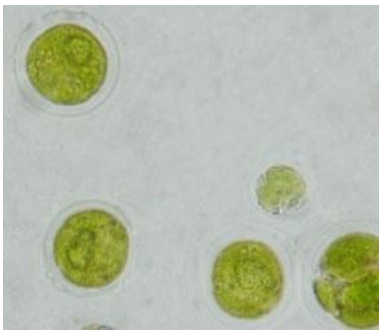

Fig. 3

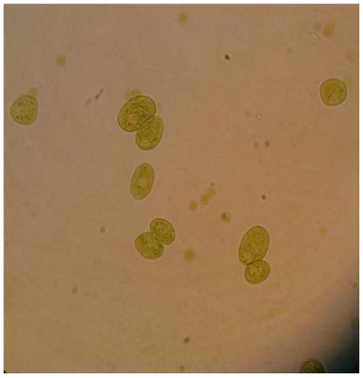

Fig. 4

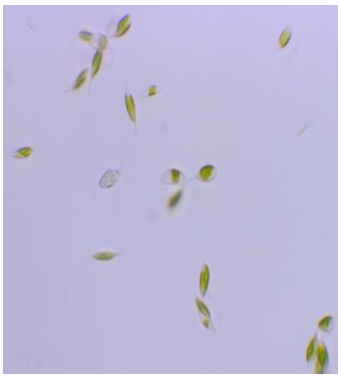

Fig. 5

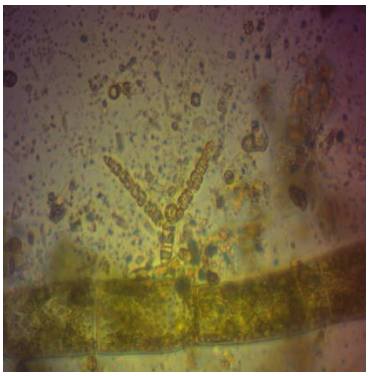

Fig. 6

Fig. 7

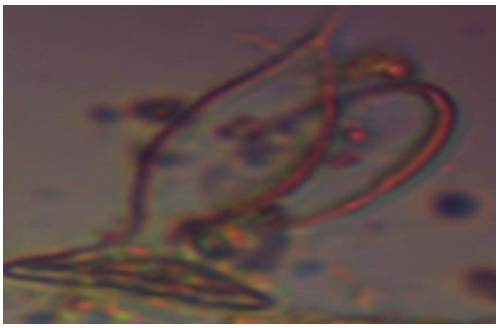

Fig. 8

Fig. 9

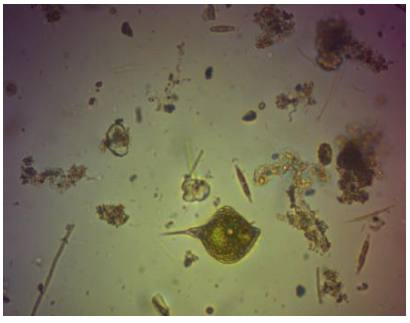

Fig. 10

Plate 1: Showing Phytoplanktons reported from Gajner Lake, Bikaner

In Bikaner district Phytoplanktonic study carried out by Mali, M. C. (2002); Barupal (2010); Modi and Mali (2011); Santosh (2017). Mali, M. C. (2002) Explored Phycodiversity of two ponds namely Devikund Sagar and Sansolav. In his study he reported algal diversity containing filamentous, colonial alga more. Santosh (2017) while working on Kodamdesar pond she reported the plenty of diatoms and desmids Genera due to eutrophied status of pond. Barupal (2010) and Modi (2011) postulations were the pioneer support to the study of Kodamdesar pond By Santosh (2017).

But in our analysis of Gajner lake we reported more abundance and variability of algal population. In our analysis green alga were profoundly present. Our research site is the part of Wildlife sanctuary, so it is abundant with green alga in contrast to other ponds of Bikaner district studied by above mentioned phycologists. however, a portion of lake openly accessed by local people of Gajner, on that site we reported plenty of diatoms and Cyanoprokaryotes as like Modi (2011), Santosh (2017) in their individual study of Kolayat and Kodamdesar pond, respectively.

CONCLUSION

All above listed Phytoplanktonic genera are observed on the site of lake which is under regulation of Sanctuary act. These were absent on Open accessed site of lake. Most of alga reported in paper belongs to Chlorophyceae class. One filamentous genus *Prasiola maxicana* reported first time from Bikaner district in our phytoplanktonic study of Gajner lake. *Prasiola maxicana* is the new citation for the algal flora of Bikaner district. 3 species of *Euglena* and *Phacus* reported in poor concentration in comparison of other classes of algae reported from lake. In the assessment of periodicity of these algal genera clearly represent that, winter season is most favorable for these algae to abode the lake.

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REFERENCES

Anantani, Y. S., & Marathe, D. V. (1947a). Observation on algae of some arid and semi-arid soils of the Rajasthan. *J. Univ. Bombay. 41*(68), 88-93.

Agarkar, D. S. (1963). A note on the occurrence of Draparnaldiopsis indica bhardwaja from Gwalior (M.P.) *J. Vk. Univ. 7*, 61.

Barupal, G. K. (2010). Chlorococcales from arid region of Rajasthan. International Symposium on Phycological Research. BHU, Varanasi. pp. 166-167.

Bhushan, B., & Kumar, M. (2013). Nostocales of Jammu, J&K, India. *Indian Journal of Applied Research. 3*(11), 26-29.

Desikachary, T. V. (1959). "Cyanophyta" A monograph. I.C.A.R., New Delhi. Fritsch, F. E. (1935). *Structure and Reproduction of Algae*. *1*. Cambridge. Uni. Press, NewYork. pp- 766.

lyengar, M. O. P., & Vimla Bai, B. (1941). Desmids from Kodaikanal, *South India. J. Indian Botsoc. 20*, 73-103.

Kashturi, C., Dass, A., & Rukshana, M. S. (2016). Studoes on biodiversity of Cyanobacteria in polluted ponds of Pattukkottai, Tamil Nadu, *India. J. Algal Biomass Utln.7*(3), 58-64.

Mali, M. C. (2002). Ecophysiological studies of Pond of Bikaner city with special reference to Phytoplankton. Ph.D Thesis, MDS university Ajmer.

Modi, & Gajanand & Mali, M. C. (2010). A preliminary report on the collection of phytoplanktons and other algae found in Kolayat Lake, Bikaner Rajasthan. *Planta Indica 6*(4), 25-26.Teena, A. (2019). Algal diversity of Morasagar Dam Swaimadhopur district Rajasthan. *International journal of molecular biotechnology 5*(1), 20-25.

Prescott, G. W. (1968). The Algae: A review Houghton Mifflin Co, Boston. Mass.

Rohitash & Mali, M. C. (2018). Studies on Fresh water Bacillariophycean Diversity of Gajner Lake, Bikaner, Rajasthan (India) Life science Bulletin - June 2018 *15*(1), 11-16ol *15*(1), 11-16.

Runuma, B., Subrata, S., & Ranjit, N. (2020). Diversity of Syctonemataceae, Microchaetaceae, Nostochopsidaceae and Stigonemataceae (Cyanophyceae) of Gossaigaon Subdivision, Kokrajhar

District, Assam. *Journal of Global Biosciences 9*(12), 8178-8187.

Santosh, Mali, M. C., & Barupal, G. K. (2017). Floristic composition and Periodical analysis of Cyanobacteria of some Fresh water aquatic bodies of Bikaner, Rajasthan India. *Journal of Algal Biomass Utilization 8*(2), 30-33.

Smith, G. M. (1959). Manual Of Phycology. The Ronald press company, New York.