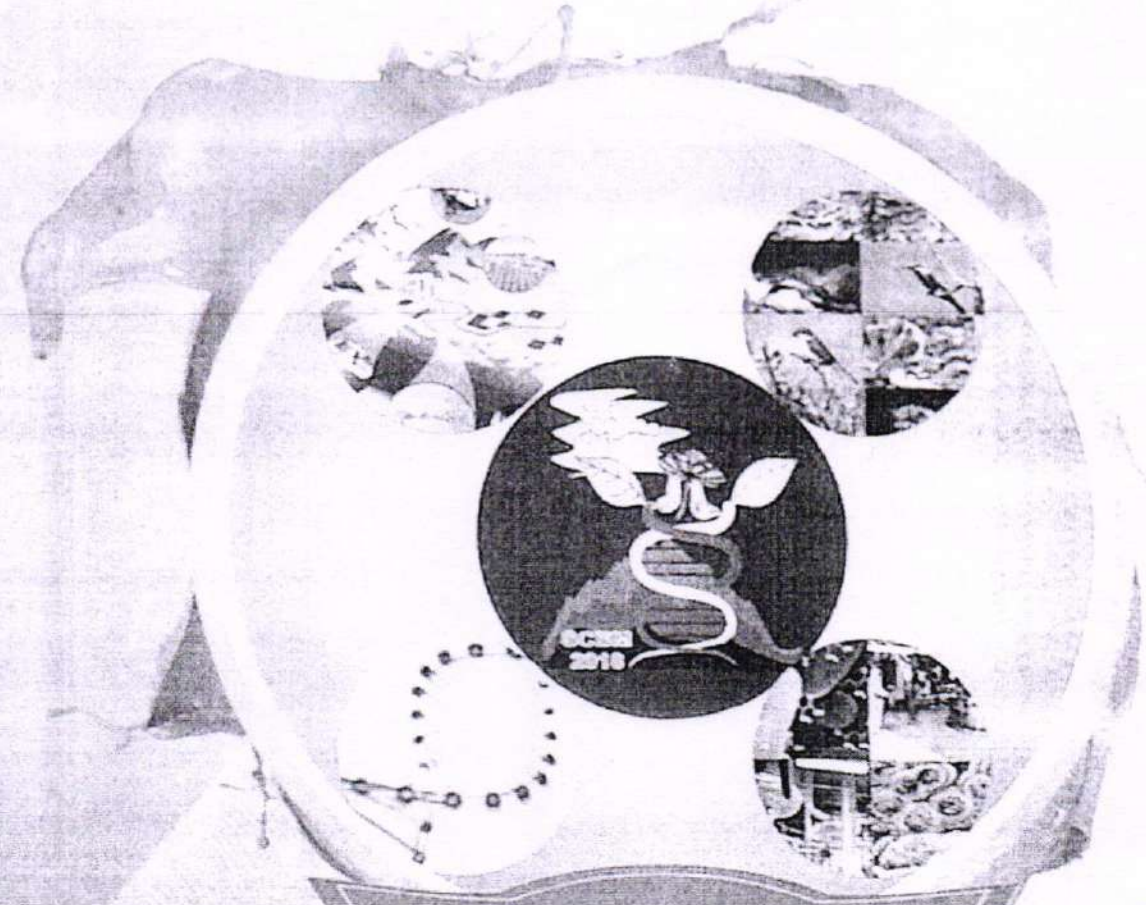
STATE LEVEL CONFERENCE ON

BIODIVERSITY OF MAHARASHTR

(SCBM-2018)

25 - 26 February 2018



ABSTRACTS

SPONSORED BY

Savitribai Phule Pune University,Pune

ORGANIZED BY

Department of Life Sciences

Arts, Commerce & Science College Sonai,

Tal: Newasa,Dist: Ahmednagar (Maharashtra) India. Pin-414105

AUTHOR INDEX

ATTESTED

PRINCIPAL
Smt. Vimlaben Khimji Tejookaya Arts Science & Commerce College
Deonar-Camp (Nashik)

I J R B A T, Vol. VI (Special Issue 2), Feb 2018 : 45-48

e-ISSN 2347 – 517X

INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY
© VISHWASHANTI MULTIPURPOSE SOCIETY (Global Peace Multipurpose Society) R. No. MH-659/13(N)
www.ijrbat.in

ECOLOGICAL AND PHYSICO-CHEMICAL OBSERVATIONS ON THREE BLOOMS OF *EUGLENA* IN PUNE, (M.S.) AREA.

Date D.W *, Rayate P.S, Chaugule B. B *****

*Department of Botany, K. K. W. College Pimpalgaon, B.,(MS) India 422209
**Department of Microbiology, S.V.K.T.. College Deolali Camp .,(MS) India
***Ex. Head, Department of Botany, SPPU, Pune .,(MS) India
E-mail: dwdate@gmail.com, mob- 9404216243

ABSTRACT:

A dence growth of planktonic algae often involving just one or few species and usually imparting a distinct colour to the water body is referred to as "Algal Blooms". This universal phenomenon is also termed as "Flowering of the water". Bloom formation is atributed to the algal genera belonging to the classes Bacillariophyceae, Chlorophyceae, Cyanophyceae, Dinophyceae, and Euglenophyceae. In the present study the author came across three water bodies having blooms caused by the species of *Euglena*. These water bodies were studied for different physico chemical parameters like color ,pH, temperature ,Dissolved oxygen ,Biochemical oxygen demand, free Co2 ,carbonates ,bicarbonates, total alkalinity,hardness,total suspended solids, sulphates ,ortho phosphates. Phytoplankton analyses were also conducted to study the dominance of *Euglena* in water bodies. Very high concentrations of organic matter, bi carbonates, phosphates and chloride were the chief features of the ponds waters having *Euglena* blooms.

Key words: - Algal bloom, *Euglena* sp, Physico chemical parameters, Pune

INTRODUCTION:

While investigating the ecology of algal blooms, the author came across three water bodies having blooms caused by the species of *Euglena*.

Blooms of Euglenoids are described by a number of phychologists such as Kashyap (1908), Naumann (1915-16), Ehrenberg (1938), Oojdics (1939), Prescott (1951), Phiipose (1960), Davis (1956), Seenayya (1971), Hosmani(1977), Hosmani and Bharati (1980) and Venkateshwarlu, et al. (1981), Das Gupta (2004), K.S. Divya (2013), Shampa Deb (2016),Raut (2017) .

Following Euglenoids have been identified by above authors, as casual algae to the phenomenon of euglenoid blooms. Euglena elastic (Prescott 1944), *Euglena sanguinea* (Ehrenberg, 1930), *E.Polymorpha* (Dangeard, 1901); E. limophylla (Lemmn),E. pisciformis klens 1883, E. *luba* (Carter 1989), *E.Proxima* (Dangeard 1901); *E.Oxyuris* var. *Chakowiensis* (Swirenko,1913 etc.)

In and around Pune, *Euglena viridis* Ehren, apperared in blooms in two of the water bodies as Range Hill and fish lake, Parandvadi where as blooms if *Euglena gracilis*, Klebs, was detected from Wagholi temple pond. Therefore, these water bodies were studied for their detail physicochemical and algal features.

RANGE HILL POND (figure -1)

The pond is located at the base of range hill bordering the sides of the University of Pune Campus. The pond is about 250' in length , 150' in breadth. The depth of the water column is about 3' only. The pond is being used to deposit solid and liquid waste from the nearby localities. About 200' on west of the pond, there is military butchery from which slaughter wastes are being discharged into the pond. The pond was also with thick cover of Lemma. The pond water appeared not to be used for any purpose.

TEMPLE POND WAGHOLI (figure -2)

The pond is situated near the historical temple of Lord Vagheshwar on the Pune-Nagar road, about 15km. North-East of Pune. The pond measures about 400' in length, 300' in width and 3' in depth. The water body is well constructed. The pond water is frequently used for washing and bathing of domestic animals.

PARANVADI LAKE

The lake under consideration is located at Bharat yatra Kendra, Jayprakashpattan, Parandvadi about 30km. North-West of Pune. It is an impoundment built on a natural stream that originates from a nearby hill. It also receives water from a canal particularly during summer. The lake is about 800' in length, 400' in breadth and about 100' in depth. During summer the water column reduces considerably. The north-east side of the lake is covered with a thick vegetation. The lake is being used for spawning. The lake was investigated for its bloom of *Euglena* in the month of June,1994.

MATERIALS AND METHODS :

Water samples from locality mentioned above was collected and analyzed for various physico-chemical parameters. Following table No. 1 describes the methodology. The methods recommended by APHA (1980) have been followed in most cases. Quantitative analysis of the algae was done by simple drop method.

Frequency of an algal form in a sediment sample was calculated by counting its individuals at 10 different fields in a single drop (0.05 ml.) under 10X or 45X magnification of microscope objectives. Algal forms from the samples were identified using standard monographs. Photographs of the study site, and the microscopic specimens were taken using"Minolta-X-700'camera.

PHYTOPLANKTON ANALYSIS: (Fig. 3) : In the Range hill pond, the bloom of *Euglena viridis* , *Ehren.* was noted.

The estimated population of *Euglena* in the pond water was 450x10^5 cells/lit. Other algal genera like *Chlorella Navicula* were few in number. In the Wagholi temple pond *Euglena gracilis*,klebs was noted as a bloom forming alga.The population estimate of *Euglena* in this pond was 199 x 10^5 cells/lit. Apart from the major population of *Euglena* other algal genera like *Cyclotella, Merismopedia,Naviculla* and *Phacus* etc.were reported in less numbers.The bloom forming alga in the fish lake was *Euglina viridis* Ehren. The population density of the *Euglena* was 307 x 10^5 cells/lit. *Crucigenia* , *Merismopedia, Naviculla* and *Scenedesmus* were also reported in the lake water. The population of these algal members collectively were about 40 x 10^5 ind/lit.

DISCUSSION :

There were occasions of Euglenoid blooms during winter as well as during summer in the ponds in and around Pune. In these ponds, the pH varied from 7 to 7.5. All the three ponds studied are with a very low dissolved oxygen concentration and high biochemical oxygen demand indicating an organically enriched nature of the water bodies. Free Co2 varied from its absence to as much as 50.60 mg/lit. The concentration of bicarbonates was much higher in all the three ponds ranging from 335 mg/lit to 540 mg/lit. In two water bodies the values of hardness, concentration of sulphates and chlorides were much higher. The amount of phosphates interestingly varies in all the three ponds encountered. The observed highest density of Euglena species was in Parandvadi fish lake as 306 × 10^5 cells/lit.

There are several reports that Euglenoids thrive well in the water with high organic matter. (Fritsch and Rich, 1913; Hodgetts, 1922; Lind, 1938; Gonzalves and Joshi, 1946; Zafar, 1959; Venkateshwarlu, 1969; Munawar, 1970; Rai, 1978; and Hosmani and Bharati, 1980). Venkateshwarlu, et al. 1981, 1990, reported presence of high organic matter in the water bodies with blooms of *Euglena* species. All the ponds studied by the author, showed very high biochemical oxygen demand.

Munawar (1970), Rai and Kumar (1977), Rai (1978), Hosmani (1977), and Venkateshwarlu (1990), found low levels of oxygen associated with *Euglena* blooms. Similar observations were also made by the author during the present study.

Lower pH values have been reported to be conductive to the Euglenoid growth by Zafar (1969), Rai and Kumar (1977), Hosmani and Bharti (1980), Rishi and Karchroo(1984), Venkateshwarlu (1990). However, Hosmani (1977,1980) and Venkateshwaelu et. al. (1990) discovered high pH values while studying *Euglena* blooms.

The pH of the Poona water bodies studied for *Euglena* blooms varied from neutral to high alkaline, indicating preference of Euglenoid for both low and high alkaline waters.

CONCLUSIONS:

If the observations made by an author are compared to the previous observations, following features appear to be most suitable for the occurrence of Euglenoid blooms in stagnant water bodies.

1. High concentration of organic matter bicarbonates, phosphates, chlorides, albuminoid ammonia and total iron.
2. Low concentrations of dissolved oxygen, nitrites, carbonates and free ammonia.

Fluctuations in pH and temperature seems to have no adverse effect on the bloom of Euglenoids.

BIBLOGRAPHY :

APHA-AWWA-WPCF,(1980) :- "Standerd Methods for the examination of water and waste water" (15th Edn.) American public Association. New Yark,1134 pp.

DAVIS,C.C. (1956) : "Notes on the bloom of Euglena haematodes in Ohio" Ecology 37 :192-193.

EHREBERG, C. G. (1938) :-"Die infusions their chews us volkommence organismen", Leopoid Voss; Lcipzig , XXII: 518 pp.

FRITSCH, F.E. & RICH , F., (1913) : "Studies on the occurrence and reproduction of British fresh water algae in nature . A four year observation of pond" . Ann.Biol.Lacust 6: 1-115.

GOJDICS,M., (1939): "Some observation on Euglena sanguine Ehrb". Trans. Amer. Micr. Soc. 58 : 241-248.

GOJDICS,M., (1953) : "The genus Euglena" ,Madison, The University of Wiscons in Press ,USA. 1-268.

GONZALVES , E.A. & JOSHI, D.B. (1946) : :Fresh water algae near Bombay I Seasonal succession of the algae in a tank Bandra". J.Bombay Nat. Hist. Soc. 46 (1) :154-176.

HODGETTS,W.J., (1922) : "A study of some of the factors controlling the periodicity of fresh water algae in nature", Ibid,21 (1) : 15-33.

HOSMANI , S.P. (1977) : "Notes on the occurrence of Euglena sanguine Ehrenberg at Dharwad:. J. Kar. Uni. Sci. XXII : 122-124

HOSMANI , S.P. & BHARTI ,S.G.(1980): Limnological studies in ponds & lakes of Dharwar , Comparative phytoplankton ecology of four water bodies". Phykos : 19(1) :27-43.

KASHYAP,S.H., (1908) : Euglena Sp. Notes on a peculiar form resembling E.tuba Rec.Ind. Musc. 2 :11-12.

K.S.DIVYA, S.MAHADEVA MURTHY,,E.T.PUTTAIAH , (2013): "A comparative study of the growth of Phytoplanktons in surface water samples" Journal of Innovative Research in Science,Engineering and Technology" , 2 (7).

LIND,E.M., (1938) : "Studies on the periodicity of the algae in Beauchief Ponds, Sheffield". J.Ecol. 26 : 257-274.

MUNAWAR, M., (1970 a): "Limnological studies on the fresh water ponds of Hyderabad ,India". I Biotype .Hydrobiologia 35 :127-162.

MUNAWAR, M., (1970 b): "Limnological studies on the fresh water ponds of Hyderabad ,India-II ".The biocenose distribution of unicellular and colonial phytoplankton in polluted & unpolluted environments. Ibid., 36 (1) :105-128.

NAUMANN, E., (1915-16) : "Quantitative untersuchengew user die organisemen formation der wass reflavhew. I. Euglana sunguinea Ehrenb. Intern .Rev. ges. Hydrobiol. U. Hydrogr. 7 : 214-221.

PRESCOTT, G.W., (1951): "Algae of the western Ghate Lakes Area Exelusive of Desmids & Diatoms" ,946 pp.

RAI , L.C. & KUMAR,H.D. (1977) : "Studies on the seasonal variations in the algal communities of a pond polluted with fertilizers factor effluent" .Ind. J. Eco.:4 : (2) : 124-131.

RAI,L.C. (1978) : "Ecological studies on algal communities of the Ganga river at Varanasi". Ind. J. Ecol., 5 (1) : 1-6.

RAUT K.S. (2017): "Evaluation of Phytoplankton multiplicity and correlation of it with pollution indicator species at Ravivar Peth lake,Ambajogai,Beed Marathwada Region India" Ind.Jr. of Research, 6 (6).

RISHI, V. and KACHROO ,P., (1984) : "Euglenophyceae of Doodhganga stream , Kashmir, Phykos (142) : 65-70.

SEENAYYA, G., (1971) : "Ecological studies in the plankton of certain fresh water ponds of Hyderabad. India II. Phytoplankton I". Hydrobiologia, 37 (1) : 55-58.

S.DASGUPTA, S.GUPTA & A.GUPTA (2004): "Euglenoid blooms in the flood plain wetlands of Barak vally,Assam,North Eastern India" J.of Environ. Bio.- 25 (3):369-373.

Shampa Deb -(2016): "Dynamics of Euglena bloom growing in a pond Ecosystem at Madhuraghat Flood plain area near Barak River, Southern Assam, North East, India" IJPSR, (2016), 2 (5)

VENKATESWARLU , et.al., (1981) : "Ecology of algal blooms a comparative study" .Indian J. Bot. 4(2) :31-36.

VENKATESWARLU , et.al., (1990) : "Ecology of Dinophycean & Eugleno-phycean blooms". Asian jour.Pl Sci.2 (1) :55-64.

ZAFAR, A.R. (1959) : " Two years observations on the periodicity of Eugleninea in two fish breeding ponds". J.Indian Botanical Soc , XXXVIII (4) :549-560.

Table No. 1:

Sr.No	Parameters	Methods
1.	Dissolved Oxygen	Modified Winkler method
2.	PH	pH Paper
3.	Chloride	Titrimetric method
4.	Total Hardness	Titrimetric PHYSICO method
5.	Ortho-phosphate	Ammonium molybdate stannous chloride method
6.	Sulphate	Colorimetric method
7.	Free CO_2	Titrimetric method
8.	Total Alkalinity	Titrimetric method
9.	Bi- Carbonates	Titrimetric method
10.	Carbonates	Titrimetric method

OBSEVATIONS: Table No. 2 & Graph – 1,2 & 3

SR.N	PARAMETERS	RANGE HILL POND JAN	WAGHOLI TEMPLE POND MAY	PARANVADI FISH POND JUNE
1	Colour	Green	Green	Light Green
2	Temperature °C	18	26	28
3	pH	7.5	8.5	7.0
4	Dissolved Oxygen (mg/l)	2.41	1.41	2.01
5	Biochemical Oxygen (BOD) (mg/l)	128	124	60.00
6	Free CO2 (mg/l)	50.60	32	Absent
7	Total Alkalinity (mg/l)	425	540	335
8	Carbonates (mg/l)	00	00	20
9	Bicarbonates (mg/l)	425	540	315
10	Hardness (mg/l)	208	174	56
11	Total suspended solids (mg/l)	1.62	1.20	4.40
12	Sulphates (mg/l)	0.30	15.0	0.40
13	Ortho-phosphates (mg/l)	0.63	0.37	0.10
14	Chlorides (mg/l)	-	56.28	10.72

Microbiology

Rayate PS

Mula Education Society's

Arts, Commerce & Science College, Sonai

Tal. Newasa, Dist. Ahmednagar (M.S.)

NAAC Reaccredited 'A' Grade and DBT-Star College

ISO 9001:2008 Certified Institute

17-18

State Level Conference on

BIODIVERSITY OF MAHARASHTRA

25th & 26th February 2018

Sponsored by

Savitribai Phule Pune University, Pune

Certificate

This is to certify that,

Dr./Prof./Mr./Mrs. Rayate Prerana shantaram of S.V.K.T college Deolali camp, Nashik has participated/worked as Resource person / Chaired the session / Presented a paper(Oral / Poster) / worked as a member of local organization committee in SCBM - 2018 held between 25th - 26th February, 2018 organized by Department of Life Science, Arts, Commerce and Science College, Sonai.

ATTESTED
PRINCIPAL
Smt. Vimlaben Khunji Tejookaya, Arts, Science & Commerce College Deolali-Camp (Nashik

S.V.K.T. COLLEGE DEOLALI CAMP
IQAC
INTERNAL QUALITY ASSURANCE CELL

Dr.M.J.Shaikh
Coordinator

Dr.A.R.Tuwar
Convener

Dr. S. L. Laware
Principal