



SEASONAL VARIATIONS OF PHYSICOCHEMICAL PARAMETERS AND FRESHWATER ALGAE IN PASHAN LAKE

*B.N. Zaware, *B.M. Shinde and *S.D. Pingle

ABSTRACT

Pashan lake is situated northwest to Pune railway station on NDA road. It is about 3 Km from University of Pune and 7 Km from the Pune Railway station. The lake was screened for different physicochemical parameters of water and different form of algae during the year 2001-2002. Periodic collections have been made from selected sampling points of the lake at an interval of a fortnight during January 2001-December 2002. The water samples have been collected in bottles and characterized for different physicochemical parameters the algal forms were observed preserved in 4 % formalin and Lugol's solution for detail studies. The live as well as preserved forms were observed under phase contract microscope and identified with help of Philipose, Smith, Fritsch and Prescott. Individual algal form or colony was microphotographed in Department of Botany, University of Pune, Pune-411007.

The result revealed that the water temperature varied from 16-36 °C, where as pH ranged from 6.5 to 7.4. A marked variation in total alkalinity was observed during summer season. The dissolved oxygen content

* Department of Botany, Baburaoji Gholap College, Sangvi, Pune - 411 027

was high during summer season. Nitrate level varied from 1.02 to 2.52 mg/L. Lowest concentration of nitrate, phosphate, chloride, carbonate, sulfate, calcium and magnesium were recorded during the pre-monsoon and monsoon seasons.

The results on fresh water algae indicated that the most of the algae forms were planktonic, free floating and epiphytic. The algae forms belong to different genera of Cyanophyceae, Chlorophyceae, Bacillariophyceae, Dinophyceae, Chrysophyceae and Euglenophyceae. The results on seasonal variations in algae forms revealed that the members of Cyanophyceae were abundant in monsoon while members of Chlorophyceae were increased during post monsoon to winter season. On the other hand diatoms were found abundant through out the year except in October- November

The result of present investigation reveals that physicochemical parameters of lake water significantly influenced the algae vegetation.

Introduction

The Pashan lake is situated near the Pashan village about 3 kilometers away from Pune university campus towards northwest and 7 Km from Pune Railway station. It is used for, drinking water and fishing by people of that area. Recently it was declared as bird sanctuary. The previous studies on the algae of Pashan lake were made by Dixit (1935) and Pingle (1990a,b) they observed large number of algal forms : and their periodicity.

After 1984 there are lot of changes in and around the lake due to urbanization and human activities. Recently a new bypass for Mumbai -Banglore highway was constructed around the Pashan lake. Several multistoried buildings and hotels are constructed for domestication purpose. The lake receives water from Ram River. There is large population settlement along the banks of the river in the upper region of the lake. The lake is becoming very shallow due to heavy siltation.

Material and methods

The lake was screened for different forms of algae during the year 2001-2002. Periodic collections have been made from different sampling points of the lake once in a fortnight during November 2001- October 2002. The water samples have been collected in bottles and characterized for different physicochemical parameters (APHA Method-1985). Except pH and temperature the rest of the parameters are expressed in mg/Litre. The algae samples have been collected in

Table-1 Seasonal variation in Physicochemical parameters in Pashan lake water During November-2001 - October-2002

Parameters	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct
Dissolved Oxygen	2.13	5.20	3.70	4.37	5.13	4.20	4.81	1.40	1.38	2.47	3.03	2.60
Nitrates	1.20	2.00	1.90	2.00	2.00	2.50	2.50	1.50	2.40	2.33	1.87	1.30
Phosphates	0.78	0.78	0.76	0.74	0.79	0.80	0.90	0.78	0.80	0.87	0.81	0.80
Carbonates	0.79	0.79	0.82	0.80	0.68	0.65	0.40	0.15	0.20	0.35	0.59	0.65
Chlorides	45.00	35.00	29.00	28.23	28.12	27.00	37.51	45.80	46.51	41.60	41.20	43.20
Sulphates	48.00	48.20	49.17	50.20	50.00	51.00	52.35	55.10	55.10	53.00	51.00	51.00
Calcium	60.00	60.00	70.00	69.00	68.07	60.00	65.00	55.80	55.78	64.70	62.27	61.20
Magnesium	20.07	20.00	21.30	23.20	25.00	23.20	20.83	21.54	21.03	21.17	20.90	20.50
Total alkalinity	230.12	230.00	230.10	239.00	231.02	228.00	225.33	239.70	238.57	230.05	227.00	228.12
pH	7.3	7.3	7.4	7.4	7.3	6.8	6.8	6.5	7.0	7.1	7.0	7.0
Temperature	21.0	20.0	16.0	20.0	25.0	28.0	31.0	36.0	27.0	26.0	25.0	23.0

Values are mean of three observations and three locations

polyethylene bottles and preserved in 4 % formalin and Lugol's solution for detail studies. The live as well as preserved forms were observed under research microscope and identified with help of Fritsch (1935), Smith (1950), Prescott (1951) and Philipose, (1959). Individual algal form or colony was microphotographed in Department of Botany, University of Pune, Pune 411 007.

Observations

The result revealed that the water temperature varied from 16-31 °C, where as pH ranged from 6.5 to 7.4. A marked variation in total alkalinity was observed during summer season. The dissolved oxygen content was high during summer season. Nitrate level varied from 1.02 to 2.52 mg/L. Lowest concentration of nitrate, phosphate, chloride, carbonate, sulfate, calcium and magnesium were recorded during the per-monsoon and monsoon seasons.

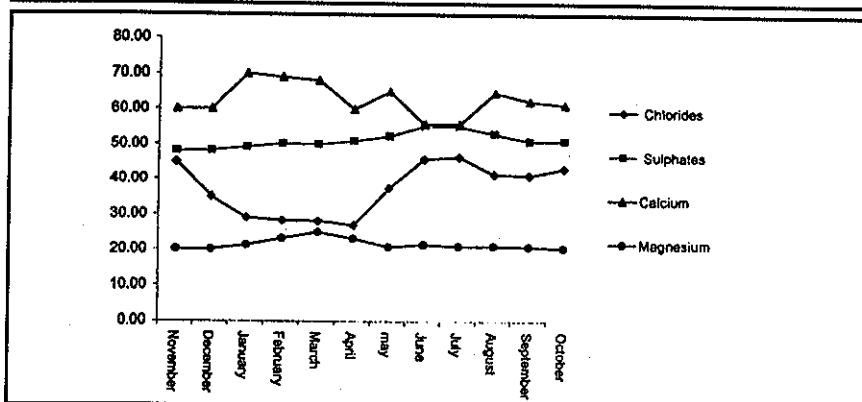
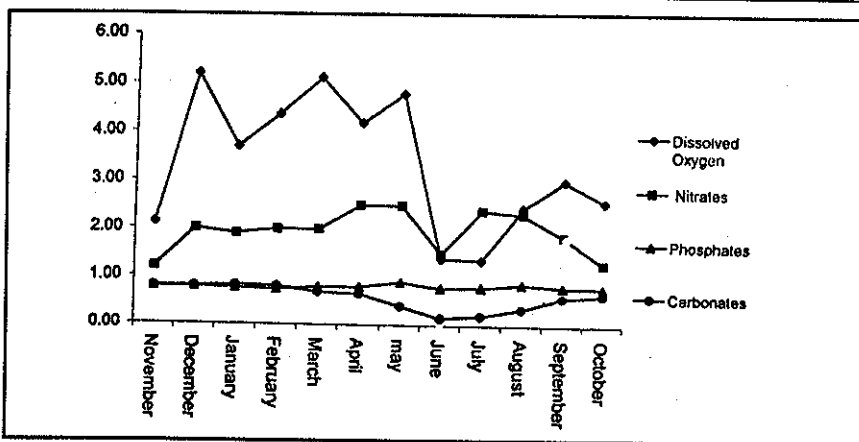
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The result of present investigation reveals that physicochemical parameters of lake water significantly influenced on algae vegetation.

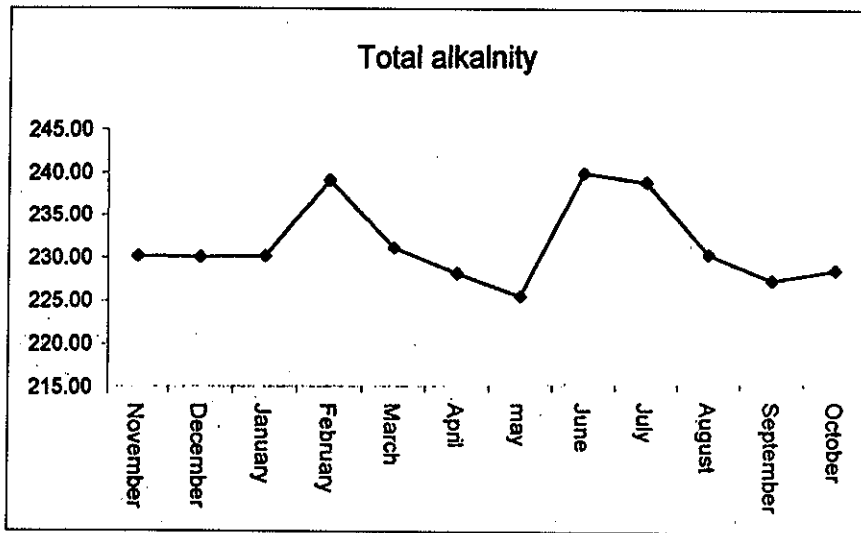
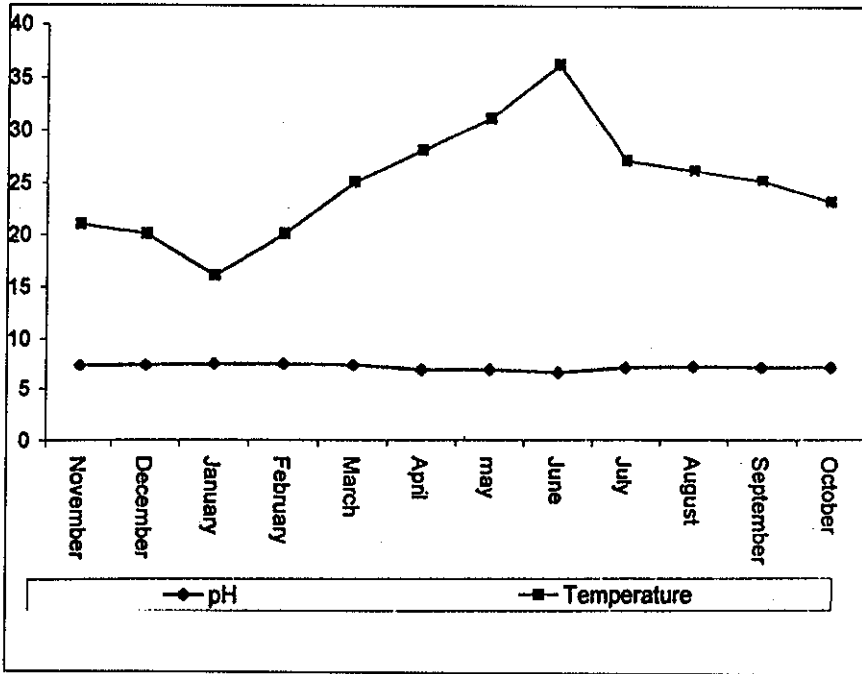
Table: 2 List of algal forms collected from the Pashan lake, Pune

Algal group 16, 25	Algal form
Chlorophyceae 11,12	Closterium acutum, C. dianae; Tetraedron gracile; Actinastrum hantzschii; Pediastrum simplex, P. duplex, P. clathratum; Coelastrum cambricum; C. microporum, C. reticulatum, C. scabrum; Crucigenia crucifera; Scenedesmus armatus; Oedogonium crassum, O. globosum; Pithophora sp.; Rhizoclonium hieroglyphicum; Cosmarium moniliforme, C. depressum; spirogyra sp.; Chara zeylanica, Oocystis solitaria, O. gigas; Hydrodyction sp., Dycisphaeriurn chrenbergianum; Ankistrodesmus sp. Pandorina morum;

Cyanophyceae 8,8	Aphanocapasa pulchra; Oscillatoria princeps; Lyngbya magnifica; Arthrospira gomontiana, Spirulina gigantea; Anabaena laxa; A. spiroides, Nostoc paludosum; Cylandrospermum sp. Merismopoedia convoluta; Microcystis aeginoso
Bacillariophyceae	Synedra ulna, Fragilaria capuncina; Navicula mutioa; Gomphonema intricatum; Cymbela tumida; Pinnularia brebissonii; Cyclotella melosiradiis; Melosira granulatatum.
Diophyceae 3,3	Gymnodinium neglectum; Ceratium hirundinella
Chrysophyceae 2,2	Dinobryon sertularia; Sinura uvella.
Euglenophyceae 2,4	Euglena acus U. lepocimplis; Phacus helecoides, Paratus;



Seasonal variation in Physicochemical parameters in Pashan lake water During the year 2001-2002 Starting Month November - 2001 Ending Month October - 2002



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