DIVERSITY OF BACILLARIOPHYCEAE IN VALVAN LAKE OF MAVAL, (M.S.), INDIA.

S. S. Pokale
Department of Zoology
Dr.B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Science College, Lonavala -410403.
Maharashtra, India
(Affiliated to Savitribai Phule Pune University)
Email: - spokale7@gmail.com

Abstract: -

Lakes, rivers and reservoirs are the very important water resources and used for various purposes Valvan Lake is principal fresh water body located in Valvan Tahsil, Maval Pune, Maharashtra. A study of Bacillariophyceae was undertaken during 2015-2016. This water body is utilized by local residents for washing clothes and also misused for open defecation. Siltation is also responsible for polluting the water. In Bacillariophyceae, 6 species were recorded during the study.

Key words: - Diversity, Bacillariophyceae, Valvan Lake.

INTRODUCTION

Bacillariophyceae or diatoms are largely spread and occur in abundance in water. They are autotrophs but can use organic substance as nutrients. The quality of water, presence of organic matter, dissolved oxygen, pH of water and physical factors play an important role in the ecological distribution of Bacillariophyceae in water.

MATERIAL AND METHODS

The water samples were collected from the three sites of Lake such as site A, site B, site C and site D. The samples were collected in the morning hours between 8.30 a.m to 10.30 a.m. 50 liters of water sample was filtrated through the plankton net made of bolting silk number 25 with mesh size 64 lime. The collected samples were allowed to settle down by adding Lugol's iodine. Sedimentation required 24 hours after which supernatant was removed and concentrate

was reduced to 50 ml depending on the number of plankton and preserved in 5% formalin for further studies.

For the quantitative study, the concentrated sample was shaken and one drop of sample was taken on a clear micro slide with the help of a standard dropper, the whole drop was carefully covered with the cover glass and observed. Plankton identification up to genera and whenever possible up to species level was classified according to the keys given by Edmonson (1959), Adoni (1985) and APHA (1985) and standard analysis was undertaken as per Zar (2005).

Quantitative study of plankton was done by Sedgwick – Rafter Cell method.

Sedgwick–Rafter Cell method

The Sedgwick Rafter Cell is a special kind of slide similar to the Haemocytometer. The cell has a 50 mm x 20 mm x 10 mm rectangular cavity that holds 1 ml sample. The cell is moved in horizontal directions on the stage of an inverted microscope and planktonic species encountered in the field are enumerated. A number of replicate samples are enumerated to calculate plankton / ltr.

Plankton (Units /ltr.) = n x c /v

Where, n = number of planktons in 1 ml.

c = volume of concentrate.

v = volume of sample in liters.

RESULT AND DISCUSSION

Total of 6 species of Bacillariophyceae were recorded in all from all the four sampling sites A, B, C and D from the Lake under study. The species diversity shows little variation in sampling sites of the lake. In site A, Bacillariophyceae was represented by 7 species, in site B, Bacillariophyceae was represented by 7 species, in site C, Bacillariophyceae was represented by 5 species and in site D, Bacillariophyceae was represented by 5 species. Meshram and Dhande (2000) recorded 6 species belong to Bacillariophyceae in Wadali Lake Amravati, Maharashtra. Bahura (2001) observed 14 species belong to Bacillariophyceae in Bikaner, Rajasthan. Tiwari

and Chauhan (2006) collected 14 species of Bacillariophyceae in Kitham Lake of Agra. Begaum and Narayana (2006) collected 23 species of Bacillariophyceae from Vangarere , Karnataka. Murugesan and Sivasubramanian (2008) reported 21 genera with 42 species belongingto to Bacillariophycae from Porur Lake, Chennai. Aijaz, et.al., (2009) observed Bacillariophyceae contributed 42 species from Wular Lake and Padhi, *et.al.,* (2010) collected 21 genuses with 22 species of Bacillariophycae from the Lake in Maharashtra. R. Prathap Singh and G.S. Regini Balasingh (2011) recorded 13 species of Bacillariophyta in Kodaikanal Lake of Dindugal District. R. Prathap Singh and G.S. Regini Balasingh (2012) recorded 33 species of Bacillariophycae in Kodaikanal Lake, Dindigul District, Tamilnadu. D.S. Malik and Umesh Bharti (2012) recorded 11 species of Bacillariophyceae in Sahastradhara stream at Uttarakhand.

SITE A

In site A 7 species of Bacillariophyceae were recorded among which *Synedra ulna* (623 no./ltr.) were dominant followed by *Pinnularia* (257 no./ltr.), *Cocconeis placentula* (86 no./ltr.), *Gyrosigma kutzingii* (69 no./ltr.), *Nitzschia sigmoidea* (56 no./ltr.), *Cyclotella* sp. (50 no./ltr.) and *Anomoeoneis sphaerophora* (48 no./ltr.)

SITE B

In site B 7 species of Bacillariophyceae were recorded among which *Synedra ulna* (174 no./ltr..) were dominant followed by *Rhopaldia gobba* (118 no./ltr.), *Anomoeoneis sphaerophora* (60 no./ltr.), *Bacillaria paradoxa* (51 no./ltr.), *Pinnularia* sp. (48 no./ltr.), *Nitzschia sigmoidea* (46 no./ltr.) and *Cyclotella* sp. (38 no./ltr.).

SITE C

In site C 5 species of Bacillariophyceae were recorded among which *Gyrosigma kutzingii* (76 no./ltr.) was dominant followed by *Rhopalodia gibba* (66 no./ltr.), *Diotoma* sp. (52 no./ltr.) *Pinnularia* sp. (46 no./ltr.), and *Bacillaria paradoxa* (37 no./ltr.)

SITE D

In site D 6 species of Bacillariophyceae were recorded among which *Bacillaria paradoxa* (124 no./ltr.), were dominant followed by *Rhopaldia gobba* (105 no./ltr.), *Navicula radiosa* (102 no./ltr.), *Pinnularia* (48 no./ltr.), *Diotoma* sp. (35 no./ltr.) *Diotoma* sp. (19 no./ltr.), and *Gyrosigma kutzingii* (17 no./ltr.).

Meshram and Dhande (2000) reported *Symbella* sp., *Naviculla* sp. and *Nitzschia sp.* from the polluted Wadali Lake, Amravati, Maharashtra. Banaker, *et.al.,* (2005) observed several pollution indicator species of Bacillariophyceae from Chandravalli tank, Chitradurga, Karnataka. Jindal and Gussain (2007) observed *Naviculla* sp. and *Nitzschia* sp. as a pollution indicator species of Bicholli pond, Rajasthan. The observation regarding the presence of Diatomsas as an indicator of pollution of water was made by many workers. (Patrick, 1973, Reynolds, 1973, Stoermer, *et.al.,* 1978).

In the present investigation, Bacillariophyceae were maximum during the summer season and minimum during the monsoon season in site B. Banaker, *et.al.,* (2005) observed maximum number of Bacillariophyceae during February and March and minimum during January in Chandravalli tank, Chitradurga, Karnataka. Saad and Abbas (1985) recorded that the highest number of diatoms during the period of highest temperature. Waghmare and Mali (2007) recorded the highest density of diatoms during the summer season in Kalamnuri irrigation dam of Hingoli District, Maharashtra. D. S. Malik and Umesh Bharti (2012) revealed that Chlorophyceae were maximum during the winter season and minimum during the monsoon season in Sahastradhara stream, Uttarakhand.

In the present investigation the maximum density of Bacillariophyceae was recorded during the summer season due to high temperature as high temperature favors luxuriant growth of Bacillariophycea and also in the site which is rich in organic matter and has minimum density of Bacillariophycae in rainy season at site B due to sudden fall of temperature, more human acti vities and dilution of water by rain water.

Table No. 1: Seasonal variation of phytoplankton in Valvan Lake at site-A during year 2015-2016

Sr.No.	Parameters	Monsoon	Winter	Summer	Total
1	Bacillariophyceae	30.15 ± 25.87	59.77 ± 16.01	50.30 ± 26.49	46.74±4.78

Table No. 2: Seasonal variation of phytoplankton in Valvan Lake at site-B during year 2015-2016

Sr.No.	Parameters	Monsoon	Winter	Summer	Total
1	Bacillariophyceae	41.12 ± 17.19	60.67 ± 9.25	40.90 ± 12.74	47.56 ± 3.24

Table No. 3: Seasonal variation of phytoplankton in Valvan Lake at site-C during year 2015-2016

Sr.No.	Parameters	Monsoon	Winter	Summer	Total
1	Bacillariophyceae	12.95 ± 7.31	39.88 ± 17.06	29.45 ± 7.88	27.42 ± 4.46

Table No. 4: Seasonal variation of phytoplankton in Valvan Lake at site-D during year 2015-2016

Sr.No.	Parameters	Monsoon	Winter	Summer	Total
1	Bacillariophyceae	14.38 ± 8.59	40.97 ± 18.84	35.50 ± 9.64	30.28 ± 4.60

Graphical representation of Seasonal Variation of Bacillariophyceae parameter of Phytoplankton in Valvan lake at various sites during year 2014-2015 is presented below.

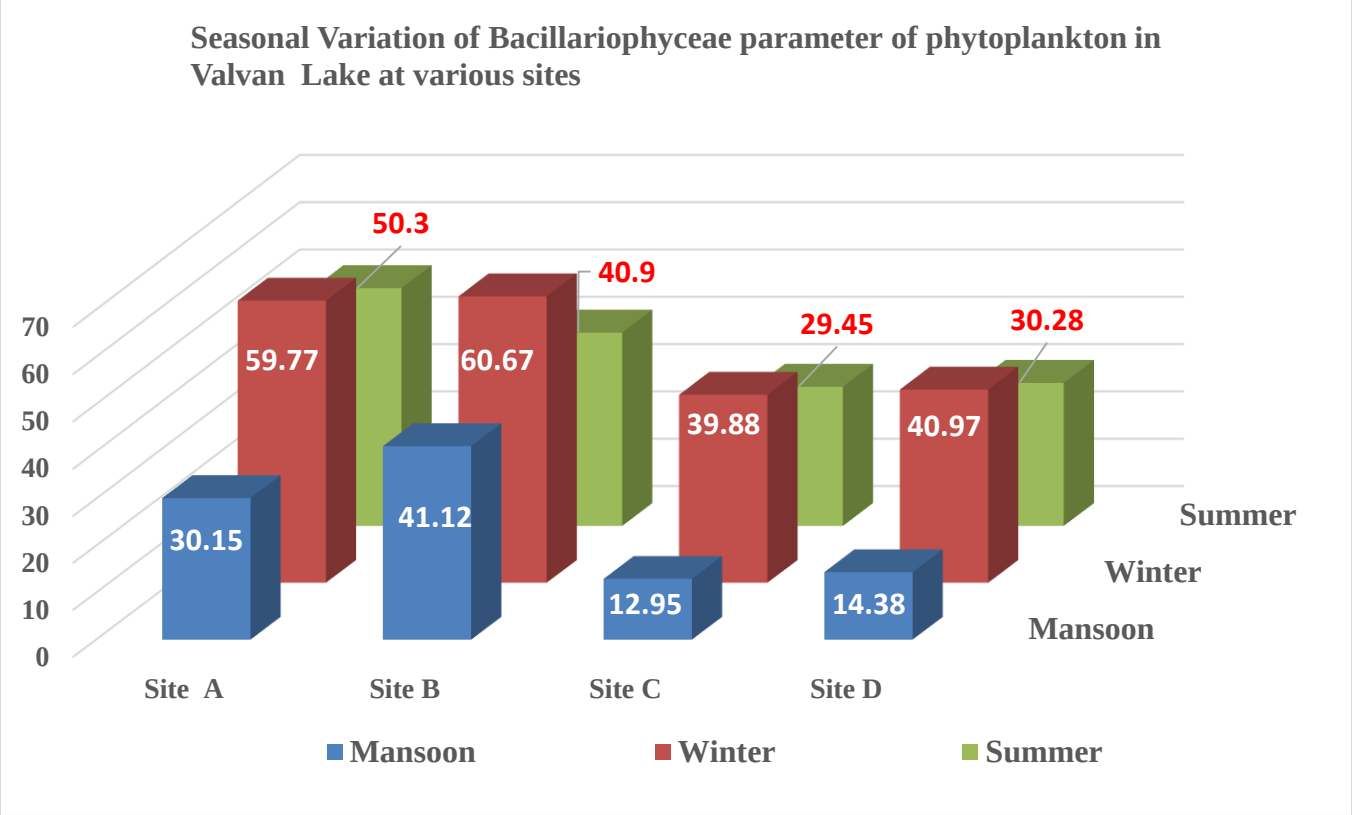

Figure 1

Photo: - Valvan lake at various sites

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