



BACILLARIOPHYCEAE DIVERSITY OF JUTPANI LAKE OF DHARNI (MELGHAT), DISTRICT AMRAVATI (M.S.), INDIA

Botany

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ABSTRACT

The Jutpani Lake is principal fresh water body located in Jutpani village of Dharni (Melghat) tahsil in Amravati district of Maharashtra state. Dharni (Melghat) is a tahsil place and it is 148 km north west side of Amravati and 80 km east side from Burhanpur Madhyapradesh. It is situated at about 500 m above the mean sea level. A study of Bacillariophyceae was undertaken during June 2015 to May 2016, one year to assess the types of Bacillariophyceae presents in this water body. This water body is used by local resident's people for Wasing cloth, Irrigation, Fishing activities and Open defecation. The Bacillariophyceae is important group of freshwater blue green algae. They include some of the most common species which are important both ecologically and scientifically. During the present study 9 species of Bacillariophyceae were found at all three sampling sites of Jutpani Lake.

KEYWORDS

Jutpani lake, Bacillariophyceae Diversity.

INTRODUCTION :

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

Jutpani lake is 8 km south east side from Dharni (Melghat) Tahsil at about 500 m above mean sea level and is at 77°11'50"E longitude and 21°26'45" N latitude. Jutpani Lake receives the water from the surrounding catchment areas during the monsoon period. The area of Jutpani Lake is spread over 400 acres. The depth of water is 37 feet during the monsoon and 14 feet during the summer season. The water of this lake is primary used for washing, bathing, fishing activities, agriculture and other domestic purpose but now it is at a transitional state with respect to degradation.

MATERIAL AND METHOD :

Sample for planktonic study were collected monthly from three sites of lake. The samples were collected in the morning hours between 7.30 a.m. to 11.00 a.m. 50 Lt. of water sample was filtered 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. Normally sedimentation requires 24 hrs. after which supernatant was removed and concentrate was made up to 50 ml. depending the number of plankton and preserved in 5% formalin for further studies.

For the quantitative study the concentrated sample was shaken and immediately one drop of sample was taken on a clear micro slide with the help of standard dropper the whole drop was then carefully covered with the cover glass and observed. Plankton identification up to genera and whenever possible upto species level was classified according to keys given by Prescott (1954), Edmonson (1959), Sehgal (1983), 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 direction on the stage of an inverted microscope and plankton species encountered in the field are enumerated. A number of replicate samples are enumerated to calculate plankton/lit.

Plankton (units/lit) = $n \times c/v$

Where, n = number of plankton in 1ml

c = Volume of concentrate

v = Volume of sample in lit.

RESULT AND DISCUSSION:

In present investigation Bacillariophyceae a total of 9 species were recorded from all the three sampling sites A, B and C from the lake under study. In site A, Bacillariophyceae were recorded by 7 species in 2015-16, in site B, Bacillariophyceae were represented by 7 species in 2015-16 and in site C, Bacillariophyceae was represented by 9 species in 2015-16.

Meshram and Dhande, (2000) reported 8 species belong to Bacillariophyceae in Wadali lake of Amravati, Maharashtra. Bahura, (2001) recorded 14 species belong to Bacillariophyceae in Bikaner, Rajasthan. Tiwari and Chauhan, (2006) founded 14 species of Bacillariophyceae in Kitham lake of Agra. Begaum and Narayana, (2006) reported 23 species of Bacillariophyceae from Vangare city of Karnataka. Murugesan and Sivasubramanian, (2008) observed 21 genera with 42 species belong to Bacillariophyceae at Porur lake of Chennai.

In present investigation In site A, during 2015-16, 7 species were recorded among which *Pinnularia* sp. (62 no./lit) is dominant followed by *Gyrosigma kutzingii* (59 no./lit), *Rhopalodia gibba* (56 no./lit), *Diatoma* sp. (54 no./lit), *Bacillaria paradoxa* (39 no./lit), *Cyclotella* sp. (30 no./lit) and *Synedra ulva* (20 no./lit)

In site B, during 2015-16, 7 species were recorded *Synedra ulva* (379 no./lit) was dominant followed by *Rhopalodia gibba* (133 no./lit), *Gyrosigma* sp. (62 no./lit), *Nitzschia sigmaidea* (56 no./lit), *Anomooneis sphaerophora* (53 no./lit), *Diatoma* sp. (30 no./lit) and *cyclotella* sp. (26 no./lit).

In site C, during 2015-16, 9 species were recorded among which *Synedra ulva* (581 no./lit) was dominant followed by *Rhopalodia gibba* (211 no./lit), *Navicula radiosa* (153 no./lit), *Nitzschia sigmaidea* (72 no./lit), *Gyrosigma kutzingii* (66 no./lit), *Bacillaria paradoxa* (58 no./lit), *Pinnularia* sp. (29 no./lit), *Diatoma* sp. (26 no./lit) and *Cyclotella* sp. (19 no./lit).

Among the different species of Bacillariophyceae in site A, *Pinnularia* sp. was dominant followed by *Gyrosigma* sp., *Rhopalodia gibba*, *Diatoma* sp., *Bacillaria paradoxa*, *Cyclotella* sp. and *Synedra ulva* in site B of lake. *Synedra ulva*, *Rhopalodia gibba*, *Pinnularia* sp., *Gyrosigma kutzingii*, *Diatoma* sp. *Nitzschia sigmaidea* and *Bacillaria paradoxa* in site C of Lake *Synedra ulva* was dominant followed by *Rhopalodia gibba*, *Navicula radiosa*, *Diatoma* sp., *Nitzschia sigmaidea*, *Pinnularia* sp. and *Cocconeis placentula*, *Anomooneis sphaerophora*, *Cyclotella* sp.

Jindal and Gussain, (2007) reported *Naviculla sp.* and *Nitzschia sp.* as a pollution indicator species of the Bicholli pond of Rajasthan. The uses of Diatoms as an indicator of pollutions of water were the opinion made by many workers. (Patrick, 1973, Reynolds, 1973, Stoermer, et.al., 1978). Abdar, (2013) observed presence of organic pollution indicator *Navicula schizanema* and *Nitzchia bilobata* Lake in Shirala (M.S.).

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

CONCLUSION:

In the present investigation, the maximum amount of Bacillario phyceae during in the winter due to probable sunlight and increase in domestic sewage, human generated pollution, an minimum quantity during the Monsoon season is probably due to increase in water quantity.

Table 1 : Yearly variation of Phytoplankton from sites of Jutpani Lake during year 2015-16

S.N.	Parameters	A	B	C	Total
1	Bacillarioph yceae	27.75 ± 19.61	63.67 ± 44.55	99.50 ± 25.71	64.97 ± 15.61

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