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RESEARCH ARTICLE

STUDIES ON DIVERSITY AND SEASONAL VARIATION OF DIATOMS.

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Abstract

The present study is to document the diversity and distribution of the fresh water Diatoms of a Lake located in Chandrugonda area of Khammam district Telangana state, South India. For the study of Bacillariophyceae biodiversity, the survey was conducted and samples were collected month wise from all selected sites of the Lake for a period of one year, November 2014 - October 2015. Altogether 20 Bacillariophycean members, popularly called as Diatoms were recorded from the study area.

Introduction:-

Bacillariophyceae or Diatoms, a unique group of organisms is cosmopoliton, they grow in variety of habitats such as fresh water, wet sand and muddy areas. The members of Diatoms are unicellular and colonial aggregation form, the two major modes of existence of these species are benthic and planktonics. Benthic forms live upon substrata, like rocks, sand and are epiphytic. The planktonics are free-floating living near the surface of study site. The Diatoms form a major component of the planktonic vegetation. They serve as primary producers in the food web of aquatic ecosystem. Fresh water Diatom species have been studied by several workers such as Gonzaives (1947), Gandhi (1952), Venkataraman (1956), Pandey UC & Pandey DC 1980 a , Sarode PT & Kamat ND 1980 a. However the diatom diversity from lakes of khammam is unexplored. The present study includes systematic account of 20 species.

Study area:-

A lake situated in Chandrugonda area of khammam district is selected for assessment of biodiversity of Bacillariophycean members**.** The environmental conditions during study period are with a rainfall of 860 mm, the average minimum temperature is 19^0C in December and Maximum is 48^0C in April-May. Based on the topography and geographical features **(Table-I)** of the study site it is confirmed that high temperatures and ph show positive significance for the growth of Diatom species.

Table 1:-

Latitude	**17 ° 23′0''**
Longitude	**17 ° 23′0''**
Air Temperature	**19^0C- 48^0C**
Water Temperature	**17^0C- 40^0C**
Ph	**7.2 – 8.0**
Rainy season	**June-September**
Average Rainfall	**860 mm**

Materials and methods:-

Water samples were collected from different sites of the lake for the study of Bacillariophycean biodiversity. The survey was conducted and samples were collected month wise from all selected sites of th lake for a period of one year November 2014 to October, 2015,covering all localities like surface, bottom of the lake, lake canals, and lake

surrounding crop fields. Collected samples were placed in centrifuge tube to remove carbonates and organic matter. After one week the samples were washed with distilled water, then placed in 50% alcohol and preserved in 4% formalin. Collected samples were stained and mounted on a slide and examined for identification by using Olympus Binocular Microscope. Identification of the taxa was done using Fritsch (1961), Prescott (1962), Gandhi (1956), Mohan (1980) and Krishnamurthy V (1954). The collections have been deposited in Phycology lab, Department of Botany, Telangana University, Nizamabad.

Results and discussion:-

The study revealed that the lake is eutrophic in nature and is dominated by Bacillariophyceae members (**Table - II).** However high species diversity was exhibited by the genera Navicula. Altogether **20** taxa were recorded from the study area, which were unicellular, and colonial aggregation forms and pseudo filamentous. The Genera **Cyclotella** and **Melosira** belong to Centrales, the cell exhibits radial symmetry . The Genera **Achnanthes, Cymbella, Calonies, Gomphonema, Navicula, Nitzschia, Pinnularia** and **Synedra** belong to Pennales which exhibits bilateral symmetry. The identified species occurred in water, on rocks, wood, mud area, few are epiphytic and endophytic. The Diatom species showed maximum count in summer and rainy seasons, minimum count in winter season. Dominant species were **Cyclotella glomerata, Achnanthes lanceolata, Caloneis bacillaris, Cymbella cymbiformis, Gomphonema gracile, Navicula cuspida** and **Pinnularia gibba.**

Based on the species

Navicula > Cymbella = Cyclotella > Nitzschia > Melosira = Achnanthes = Calonies = Fragilaria = Gamphonema = Pinnularia = Synendra**.**

Table- 111:- enlists the Diatoms recorded in lake water showing seasonal variation

Table 2:-

S.no	Family	Number of genera	Number of species
1	**Naviculaceae**	**3**	**7**
2	**Coscinodiscineae**	**2**	**4**
3	**Fragillariaceae**	**2**	**2**
4	**Cymbellaceae**	**1**	**3**
5	**Nitzschiaceae**	**1**	**2**
6	**Achanthaceae**	**1**	**1**
7	**Gomphonemataceae**	**1**	**1**

Diatoms recorded in lake water showing seasonal variation

S.No	Scientific Name	Order	Family	Winter	Summer	Rainy
1.	**Cyclotella glomerata**	Centrales	Coscinodiscineae	-	++	++
2.	**Cyclotella meneghiniana**	Centrales	Coscinodiscineae	+	+	+
3.	**Cyclotella stelligera**	Centrales	Coscinodiscineae	+	+	-
4.	**Melosera granulata**	Centrales	Coscinodiscineae	-	+	+
5.	**Achnanthes lanceolata**	Pennales	Achnanthaceae	+	++	++
6.	**Caloneis bacillaris**	Pennales	Naviculaceae	+	++	+
7.	**Cymbella affinis**	Pennales	Cymbellaceae.	+	+	+
8.	**Cymbella cymbiformis**	Pennales	Cymbellaceae	-	++	+
9.	**Cymbella tumida**	Pennales	Cymbellaceae	+	-	+
10.	**Fragilaria virescens**	Pennales	Fragillariaceae	+	+	+
11.	**Gomphonema gracile**	Pennales	Gomphonemataceae	+	++	+
12.	**Navicula cuspida**	Pennales	Naviculaceae	-	++	+
13.	**Navicula exigua**	Pennales	Naviculaceae	+	+	+
14.	**Navicula mutida**	Pennales	Naviculaceae	-	+	++
15.	**Navicula rostellata**	Pennales	Naviculaceae	+	-	-
16.	**Navicula sculpta**	Pennales	Naviculaceae	-	+	+
17.	**Nitzschia acicularis**	Pennales	Nitzschiaceae	+	+	-
18.	**Nitzschia palea**	Pennales	Nitzschiaceae	-	+	+
19.	**Pinnularia gibba**	Pennales	Naviculaceae	+	++	+
20.	**Synedra ulna**	Pennales	Fragillariaceae	-	+	+

- **Absent ; + Present ; ++ Dominant**

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