International Journal of Advanced Biotechnology and Research (IJBR)
ISSN 0976-2612, Online ISSN 2278–599X,
Vol-8, Issue-4, 2017, pp1210-1213
http://www.bipublication.com

Research Article

Freshwater Diatoms in the Bashar River of the Yasuj City, Iran

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ABSTRACT

Introduction: The present study focuses on Diatoms of Bashar Riverof the Yasuj City, Iran.The Bashar River provides a wide scope of identification of algal diversity existing in the River. The River is an important source of water for agriculture and it is essential to assess the quality of water.Diatoms are a major group of algae, and are among the most common types of phytoplankton.

Material and Methods: Three sampling stations were selected from the Bashar River.Water samples from the surface were collected at all the sampling stations at monthly intervals for a period of one year.

For phytoplankton 1 liter of water samples were collected from three different stations of the River and were kept in the sedimentation column after adding 2-3 ml of 4% formaldehyde solution.

Results and Discussions: Mainly five groups of planktonic algae were recorded in the River. In the present river Bacillariophyceae was chiefly represented, while station I exhibited much higher percentage of Diatoms as compared to other stations. In the present investigation, Bacillariophyceae found to be dominant group at all the station. Fragilaria were present in considerable number at all the station.

KEY WORDS: River, Bashar, Algae, Diatom, Bacillariophyceae

INTRODUCTION:

Diatomsare a major group of algae, and are among the most common types of phytoplankton. Diatoms are unicellular, although they can form colonies in the shape of filaments or ribbons (e.g. Fragilaria), fans (e.g. Meridion), zigzags (e.g. Tabellaria), or stars (e.g. Asterionella). The first diatom formally described in scientific literature, the colonial Bacillaria paradoxa, was found in 1783 by Danish naturalist Otto Friedrich Müller. Diatoms are producers within the food chain. A unique feature of diatom cells is that they are enclosed within a cell wall made of silica

(hydrated silicon dioxide) called a frustule[1]. These frustules show a wide diversity in form, but are usually almost bilaterally symmetrical, hence the group name. The symmetry is not perfect since one of the valves is slightly larger than the other, allowing one valve to fit inside the edge of the other. Fossil evidence suggests that they originated during, or before, the early Jurassic period. Only male gametes of centric diatoms are capable of movement by means of flagella. Diatom communities are a popular tool for monitoring environmental conditions, past and present, and are commonly used in studies of water quality. More than 200 genera of living diatoms are known, with an estimated 100,000 extant species[2][3][4][5]. Diatoms are a widespread group and can be found in the oceans, in fresh water, in soils, and on damp surfaces. They are one of the dominant components of phytoplankton in nutrient-rich coastal waters and during oceanic spring blooms since they can divide more rapidly than other groups of phytoplankton[6].

The classification of heterokonts is still unsettled, and they may be treated as a division (or phylum), kingdom, or something in-between. Accordingly, groups like the diatoms may be ranked anywhere from class (usually called Diatomophyceae or Bacillariophyceae) to division (usually called Bacillariophyta), with corresponding changes in the ranks of their subgroups.Diatoms are traditionally divided into two main groups that are primarily distinguished by frustule structures: the centrics and the pennates.

Planktonic diatoms in freshwater and marine environments typically exhibit a "boom and bust" (or "bloom and bust") lifestyle. When conditions in the upper mixed layer (nutrients and light) are favourable (as at the spring), their competitive edge and rapid growth rate enables them to dominate phytoplankton communities ("boom" or "bloom") [6].

MATERIAL AND METHODS

Three sampling stations were selected from the Bashar River. Station I is situated where on the upstream of the river and before the interruption of the wastewater treatment plant with river water. Station II is the wastewater of the wastewater treatment plant before entering the river; station III is located after the interruption of waste water with the water river. Water samples from the surface were collected at all the sampling stations at monthly intervals for a period of one year. The samples were analyzed on the same day in the laboratory for different physic - chemical parameters following the standard methods (APHA 1995) (7).

For phytoplankton 1 liter of water samples were collected from three different stations of the River and were kept in the sedimentation column after adding 2-3 ml of 4% formaldehyde solution. The material was used for frequency measurements and identification of species. For frequency measurement of different species of algae at each station, the drop method of Pearsal et al., (1946)was followed(8).

RESULTS AND DISCUSSIONS:

Mainly five groups of planktonic algae were recorded in the River. They are Bacillariophyceae, Chlorophyceae, Euglenophyceae, Cyanophyceae and Zygnematophyceae. At all the station Bacillariophyceae was dominant and occupied the first position. Chlorophyceae occupied the second position at all the stations. At station II, III Euglenophyceae and at station I Zygnematophyceae occupied the third position.

In the present river Bacillariophyceae was chiefly represented, while station I exhibited much higher percentage of Diatoms as compared to other stations.

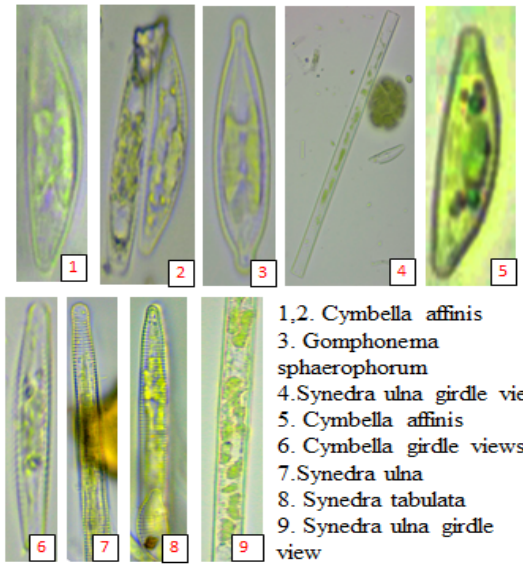
In the present investigation, Bacillariophyceae found to be dominant group at all the station. Fragilaria were present in considerable number at all the station. The species identified at different stations and the total numbers of common species are given in (Table – 1). At station I the highest peaks were observed during June and the lowest numbers were found during May. At Station II the Bacillariophyceae members were present in very low numbers during summer. At station III the highest numbers of these algae were recorded

during January (2015)-November (2016). The peaks were mainly due to Cymbella affinis, C. girdle views, C., Nitzschia palea and Ni. Acicularis, Synedra ulna girdle view, S. ulna, S. tabulate, S. ulna girdle view and these species were present throughout the period of investigation.

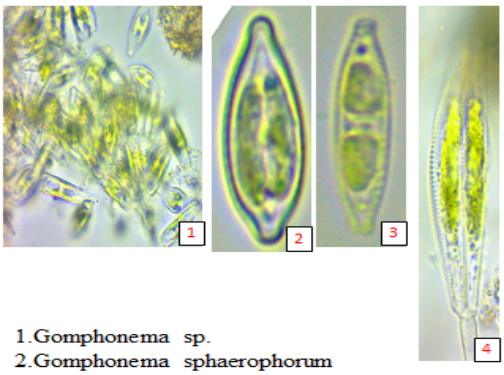
Table: 1 Common Algal Species in Bashar River

BACILLARI OPHYCEAE	*Cyclotella meneghiniana, Nitzschia palea and Ni. Acicularis,* Naviculla *rhynchocephala,* Cymbella affinis , C. girdle views, C. affinis , Gomphonema sphaerophorum , ,Synedra ulna girdle view, S. ulna, S. tabulate, , S. ulna girdle view

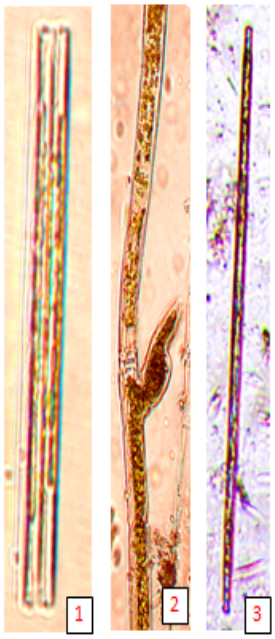
Photographs:



1,2. Cymbella affinis
3. Gomphonema sphaerophorum
4.Synedra ulna girdle view
5. Cymbella affinis
6. Cymbella girdle views
7.Synedra ulna
8. Synedra tabulata
9. Synedra ulna girdle view



1.Gomphonema sp.
2.Gomphonema sphaerophorum
3.Nitzschia palea
4. Cymbella affinis



1. Synedra ulna girdle view.
2. Pithophora sp.
3. Synedra ulna

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