

A study on diversity of diatom flora of river Narmada at district Harda, Madhya Pradesh

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Abstract

The diversity of diatom flora of river Narmada at district Harda, (M. P.) for the period of one year from in July 2015 to June 2016 have been studied. 16 genera and 45 species reported in river Narmada. During study it was found that taxa of diatoms are *Fragilaria papillosa*, *Navicula cryptocephala*, *N. rostrata*, *Nitzschina obtuse*, *Gomphonema olivacem*, *Cymbella australica*, and *C. saffinis* were found to dominated. The diatom population much fluctuates during the climate change. Population of diatom was decrease during the month of April to June due to the various abiotic factors which influence diatom. Light, temperature, turbidity and dissolve Oxygen are the most valuable factor for the growth of diatom.

Keywords: Narmada, Dominant, Diatom, Population

1. Introduction

Natural changes in the environmental conditions along with the longitudinal profile of river systems exert direct control on the population dynamics of aquatic organisms [1]. Diatoms play a key role in the biogeochemical cycles and tend to dominate export production. Nutrients regime of aquatic ecosystem can affect the diatom communities. Therefore, diatoms will dominate phyto-plankton communities under high nutrient concentrations [2, 3, 4]. Diatoms are major producer of fresh water ecosystem. Diatoms are free floating but some species are benthic and epilithic. All the diatoms are divided in two orders on the basics of their symmetry. They are fluctuate in different seasons, winter season is most favorable for their growth because dust particle are going to settle down and water transparency increase so light is penetrated in depth of river.

2. Material and methods

Narmada is a fifth largest river of India which is located in the north reason of the District Harda. Tahsile Handia village is the main sampling station of the research work and other sampling sites are Chipaner, Joga and Magrul which are situated at the near of village Handiya.

Diatoms sample were collected in plastic bottle from all possible habitats like plant, stones and running water. Further stone sample scrub by toothbrush and diatom suspension put in to plastic bottle. Collected sample (epilithic or epiphytic) were preserved in 4% formaldehyde for further use [5, 6]. Water sample were collect to the different depth and 50 liter of the sample passed through planktonic net of 0.06mm mesh size. The filtrate thus obtained was analyzed in Botany lab [7].

3. Result and Discussion

Table 1: Showing monthly variation of Diatom in river Narmada during 2015-16.

Taxa	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
<i>Asterionella Sp.</i>	-	-	+	-	+	+	+	+	+	+	+	-
<i>Achnanthes exigua</i>	+	-	-	+	+	+	+	+	+	+	+	-
<i>A. microcephala</i>	-	-	+	-	+	+	+	+	+	+	-	+
<i>A. minutissima</i>	-	-	-	-	+	+	+	+	+	+	+	+
<i>Achnantheidium biasoletiana</i>	-	-	+	+	-	+	+	+	-	+	+	-
<i>A. lineare</i>	-	-	-	+	+	+	+	+	+	+	+	-
<i>A. minutissima</i>	-	-	-	-	+	+	+	+	+	-	+	-
<i>A. microcephala</i>	-	-	-	-	+	+	+	+	-	+	+	+
<i>Amphipleura copulate</i>	-	-	-	-	+	+	+	+	+	+	+	+
<i>Cocconeis placentrula</i>	-	+	-	+	-	+	+	+	+	+	+	-
<i>Cyclotella citrus</i>	-	-	-	+	+	+	+	+	+	+	+	-
<i>C. meneghiniana</i>	-	-	-	-	+	+	+	+	+	-	+	-
<i>Cymbella affinis</i>	+	-	-	+	+	+	+	+	-	+	-	-
<i>C. amphicephala</i>	-	-	+	-	+	+	+	+	-	-	+	+
<i>C. meneghiniana</i>	-	-	+	+	+	-	+	+	+	+	+	+
<i>C. australica</i>	+	-	-	+	-	+	+	-	+	-	-	-
<i>C. ehrenbergii</i>	-	+	-	+	+	+	+	+	+	+	+	+

<i>C. excisiformis</i>	-	-	-	-	+	+	+	+	+	+	+	-
<i>C. placentula</i>	-	-	+	+	+	+	+	-	+	+	+	-
<i>C. radiosia</i>	-	-	-	-	+	+	+	+	+	-	+	+
<i>Diatoma vugaris</i>	-	-	-	+	+	+	+	+	+	+	-	-
<i>Encyonema jemilandicum</i>	-	-	-	-	+	-	+	+	+	+	-	-
<i>Fragilaria brenstriata</i>	-	-	-	+	+	+	-	-	+	+	+	+
<i>F. papillosa</i>	+	-	+	+	-	+	+	+	+	+	+	+
<i>F. intermedia</i>	-	-	-	-	+	+	-	+	+	+	+	-
<i>F. robusta</i>	-	-	-	+	+	+	+	+	+	+	+	+
<i>Frustulia vulgaris</i>	-	-	-	+	+	+	+	-	+	+	+	+
<i>Gomphonema gracile</i>	-	-	-	+	+	+	+	+	+	+	-	-
<i>G. olivacem</i>	+	-	-	-	+	+	+	+	+	+	+	+
<i>G. parvulum</i>	-	-	-	+	+	+	+	+	+	+	+	+
<i>Melosira moniliformis</i>	-	-	-	-	+	+	+	+	+	-	-	-
<i>Navicula cryptocephala</i>	-	+	-	+	+	+	+	+	+	+	+	+
<i>N. minuta</i>	-	-	-	+	+	+	+	+	+	+	+	+
<i>N. irmengardis</i>	-	-	-	+	+	+	+	+	+	+	+	+
<i>N. linearis</i>	-	+	+	+	+	+	+	+	+	+	-	+
<i>N. pupula</i>	-	-	+	+	+	+	+	+	+	-	+	+
<i>N. rhynecephala</i>	-	-	+	+	-	+	+	+	-	+	+	+
<i>N. rostrata</i>	+	-	+	+	+	+	+	+	+	+	-	+
<i>Nitzschia acicularis</i>	-	-	-	+	+	+	+	+	+	+	+	-
<i>N.obtusa</i>	-	+	+	-	+	+	+	+	+	+	+	+
<i>N. palea</i>	-	-	-	-	-	+	+	+	+	-	-	+
<i>Planothidium lanceolata</i>	-	-	+	+	+	+	+	+	+	+	+	+
<i>P. rostrata</i>	-	-	-	+	+	+	+	+	+	+	+	-
<i>Synedra ulna</i>	+	-	+	-	+	+	+	+	+	-	-	-
<i>S. stroemii</i>	-	-	-	-	-	+	+	-	+	-	-	-
Total	7	5	12	27	39	43	43	42	40	35	33	24

Table 2

Order	Family	Genus	Species
Centrales	01	01	02
Pinneles	10	15	43
Total	11	16	45

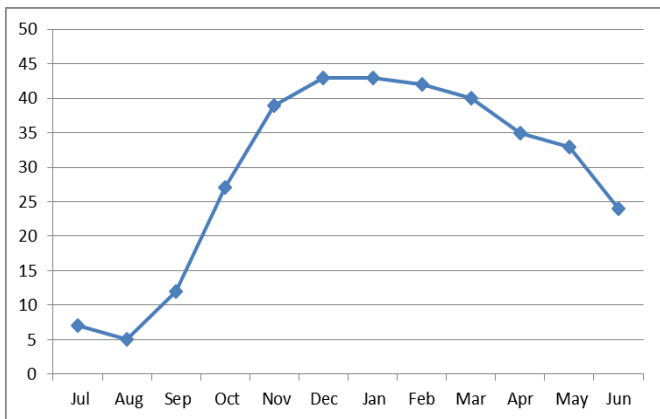


Fig 1: Showing monthly growth of Diatoms during 2015-16.

Bacillariophyceae was representing the 16 genera and 45 species that belonging to 11 families seen table 1 show result clearly indicated that Pennales dominant over the central which were represented the single genus *Cyclotella* only. Listed Diatoms are member of the following families Achnantheaceae, Stephanodiscaceae, Cymbellaceae, Fragilariaceae, Amphileuraceae, Bacillariaceae, Melosiraceae, Naviculaceae, Achnantheaceae, Cocconeidaceae, and Gomphonemataceae. Family Fragilariaceae is dominant to other because three genera *Asterionella*, *Fragilaria*, and *Synedra* are the belong to this

family. The diatom were found to benthic habit were *Nitzschia*, *Synandra*, *Cymbella*, *Navicula* and *Gomphonema* Genera *N. rostrata* *N. linearis*, *Nitzschia obtusa*, *Gomphonema olivacem* and *Cymbella affinis* were found in dominant form^[8].

Minimum population of diatom were seen in July-August month, and showed quick proliferation during post monsoon showing maximum population from December to February. They were less abundant in May to June and they disappeared in during monsoon. During September and October some diatoms like *Navicula pupula*, *N. minuta*, *Synedra ulna* and *Gomphonema parvum* were observed in very few numbers. The velocity and turbidity of water adversely affect the diatom population as observed during monsoon.

Diatom constituted the major bulk of the river flora during the month January and February. The population density of diatom like *Cyclotella meneghiniana*, *Navicula minuta*, *N. pupula*, *N. rhycocephala*, *Gomphonema parvulum*, *G.olivacem* and *Nitzschia palea* was extremely high. Primarily the diatoms comprise the dominant autotrophic community during December to February. *Cyclotella* was only centric diatom in the present study. *Cyclotella catenata* and *C. meneghiniana* are two species reported during work. Multiplication of *Synedra ulna* was probably favored by high dissolve oxygen this diatom was conspicuously absent in summer. *Achnanthes exigua* was recorded as a common diatom from December.

4. Conclusion

The member of family bacillariophyceae case was found in abundant result concluded those Narmada river 16 genera and 45 species of diatom of bacillariophyceae. Five genera

of diatom recorded as pollution indicator because their presence was very low^[9, 10]. Monthly highest species population observes in January and February month, and lowest population observes in July and August. The results of these studies clearly indicated the presence of highly specific diatom flora in investigated river. River Narmada containing a large number of species with a very restricted, even sometimes endemic distribution,

5. References

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