

## Bacillariophyceae from Purna River Basin in Parbhani District Maharashtra

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### Abstract:

The present study deals with the diversity of Bacillariophyceae in Purna river, the sub basin of Godavari river. The present work is carried out from 2015 to 2017 in this research survey total 20 Bacillariophyceae species were recorded along with 12 genus in Purna basin i.e. *Synedra*, *Stauroneis*, *Melosira*, *Frustulia*, *Mastogloia*, *Fragilaria*, *Nitzschia*, *Naviculea*, *Gomphonema*, *Amphora*, *Achanthes* and *Cymbella*. In this study *Synedra ulna* along with *Naviculea*, *Gomphonema* and *Cymbella* are most dominant in Purna river basin.

**Keywords:** Bacillariophyceae, *Cymbella*, *Gomphonema*, *Naviculea*, Parbhani and Purna.

### Introduction:

Diatoms are characteristic group which shows the presences of silicified cell wall having either bilateral or radial symmetry. These are unicellular or aggregated in to colonies. The diatoms contribute significantly to industrial economics with probably well over thousand specific uses of their cell wall (Ragland et. al. 2014). Now a day's numbers of manmade water bodies were increasing for the fish catchment that's why its need to study the water quality as well as water parameters. The primary productivity of lake depends obviously on aquatic producers which are planktonic forms called phytoplankton (Bhosale et.al. 2010). This area has tropical climate and with many large to moderate size water bodies scattered over the land surface. The present paper deals with study of diversity of class Bacillariophyceae from Yeldari dam in Parbhani district from Marathwada region in Maharashtra state. Yeldari dam was built as a small hydro power station which is built on river Purna. Later the dam was renovated and developed as a very big reservoir and tourist spot in Maharashtra. It is felt that there is a need to generate information on ecology, diversity of planktons from reservoirs (Geography of India article 2009) and the present study was done from the three sites i.e. Yeldari, Bamani and kinhi.

### MATERIAL AND METHODS:

In this survey samples were collected from the Basin of Purna river from kinhi, Yeldari and Bamni sites (Fig.1-3) water area by random sampling technique with the help of needles, forceps, net and directly by hands from different sites. Samples were collected from agricultural lands and Basin of Purna River (Mulani and Sonule 2015).

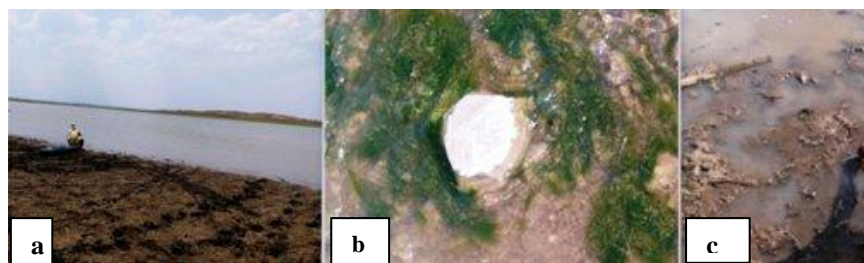


Fig 01. Algal samples collected sites a-Bamni; b-Yeldari and c-kinhi

### Sampling and Morphological study:

Collections of samples were done during the morning period in clean polythene bags and in sample bottles. The collected fresh samples were used for the identification and remaining ones were preserved in 4% formalin. For the microphotography temporary slides were made by using 10% glycerin. Photomicrography was done by of Digi camera with light microscope. Identification of the diatoms was done with the help of literature like (Sarode & Kamat 1984, Mahajan et. al. 2008, Tripathi et.al. 2012, Jadhavar and Papdiwal 2012 and 2016, Rajeshwari Krishnamurthy 2015, Das and Adhikary 2014 and Andhale et. al. 2012).

## Results:

### Description of the taxa:

1. ***Synedra ulna*** (Nitz.) Her.var.notata Kuetz (fig. a)  
Sarode, P.T. & Kamat, N.D. 1984, Pg.33.  
  
Cell solitary and free floating valves 55-64  $\mu$  long, 8-9.9  $\mu$  broad, linear with narrow pseudoraphe; striae 10-11 in 10  $\mu$ , coarse.
2. ***Nitzschia frustulum*** (Kütz.) Grunow (fig.b)  
Krammer and Lange-Bertalot 1988, p. 94  
  
Valve linear 43 – 46 $\mu$ m long and 6 – 7 $\mu$ m broad, striation fine, lineate and parallel throughout the valve, 10 – 11 in 10 $\mu$ m.
3. ***Frustulia jogensis*** Gandhi (fig.d)  
Sarode, P.T. & Kamat, N.D. 1984, Pg.63.  
  
Valves 57.5  $\mu$  long, 12.5  $\mu$  broad, striae 32 in 10  $\mu$ , perpendicular to the middle line.
4. ***Navicula anglica*** Ralfa (fig.g)  
Mahajan *et. al.* 2008  
  
Valves long, thick in 7-9 in 10 $\mu$ m.
5. ***N. cari*** Her. V. anguta Grun (fig.g )  
Mahajan *et. al.* 2008, 185-199.  
  
Valves narrowly lanceolate with striae 10-12 in 10 $\mu$ m indistinctly lineate, radial in the middle and convergent at the ends, middle striae shorter.
6. ***N. hungarica*** Grun (fig.f)  
Mahajan *et. al.* 2008, 185-199.  
  
Valves long central area small, polar stripes strongly marked, stripes 8-9 in 10 $\mu$ m, small forms, valves without long hyaline lines.
7. ***N. viridula*** Kütz. var. *chandolensis* Gandhi (fig.r)  
Prasad, B. N. and Singh, Y. P. 1996, Pg.145.  
  
Valves 70 $\mu$ m long, 13 $\mu$ m broad, striae 10 in 10 $\mu$ m in diameter.
8. ***Cymbella affinis*** Kütz. (fig.h)  
Krammer and Lange-Bertalot 1986, p 314.  
  
Frustules are elliptic – oblong, 57 – 60  $\mu$ m long and 14 – 15  $\mu$ m broad, striation distinct, transverse, parallel, 9 – 10 in 10  $\mu$ m.
9. ***C. amphicephala*** Naeg. (fig.j)  
Sarode, P.T. & Kamat, N.D. 1984, p 166.  
  
Valves 30  $\mu$  long 7.5  $\mu$  broad, asymmetrically semilanceolate, striae 12-14 in 10  $\mu$ , very slightly radial.
10. ***C. hungarica*** (Grun.) Pant. var. *signata* (Pant.) A.Cl. (fig.i)  
Sarode, P.T. & Kamat, N.D. 1984, p 170.

Valves 45  $\mu$  long 10  $\mu$  broad, asymmetrical with dorsal margin strongly convex and ventral margin more or less straight with an inflation in the middle; striae 8-10 in 10  $\mu$ , thick, radial.

11. ***Gomphonema gracile*** Ehr. var. major Grun. (fig.m)  
Sarode, P.T. & Kamat, N.D. 1984, p 187.

Valves 67.5  $\mu$  long, 10  $\mu$  broad, narrowly lanceolate, striae 10-12 in 10  $\mu$  slightly radial and finely punctate.

12. ***G. aequatoriale*** Hustedt (fig.k)  
Sarode, P.T. & Kamat, N.D. 1984, p 162.

Valves 55  $\mu$  long, 10  $\mu$  broad, clavate in the middle raphe thick; axial area narrow; central area widened; striae 9-10 in middle and 11 in 10  $\mu$ , towards the ends, clearly punctate

13. ***G. subtile*** Ehr. var. *malayensis* Hustedt. (fig.l)  
Sarode, P.T. & Kamat, N.D. 1984, p198.

Valves 35-44  $\mu$  long, 6.2-7.5  $\mu$  broad, lanceolate clavate striae 9-10 in 10  $\mu$ , radial and punctate.

14. ***Mastogloia recta*** Hustedt (fig.n)  
Sarode, P.T. & Kamat, N.D. 1984, p 61.

Valves 45  $\mu$  long, 12.5  $\mu$  broad, linear elliptical to linear lanceolate striae 12-14 in 10  $\mu$ , radial throughout, convergent at the extreme ends.

15. ***Amphora ovalis*** Kuetz. var. *gracilis* (Ehr.) Cleve. (fig.o)  
Sarode, P.T. & Kamat, N.D. 1984, p162.

Frustules 61-64  $\mu$  long, 25.6-28  $\mu$  broad, valves lunate with convex dorsal side and concave ventral side with rounded ends; striae 12-13 in 10  $\mu$ , coarsely punctate.

16. ***A. rugosa*** Hustedt (fig.c)  
Hustedt, F. 1938, Pg. 415,

Valves 30  $\mu$ m long, 17  $\mu$ m broad, striae 15 in 10  $\mu$ m in diameter. Frustules biraphid

17. ***Achanthes andicola*** (Cleve) Hustedt. (fig.p)  
Sarode, P.T. & Kamat, N.D. 1984, Pg.51-52.

Valves 41-47  $\mu$  long, 9.5-10.5  $\mu$  broad, linear, lanceolate, rapheless valve with narrow pseudoraphe; striae 14-15 in 10  $\mu$ .

18. ***Stauroneis anceps*** Ehr. var. *hyaline* Brun. Et Perag. (fig.e)  
Sarode, P.T. & Kamat, N.D. 1984, p 90.

Valves 55  $\mu$  long, 10  $\mu$  broad, sub elliptical lanceolate, striae 30 in 10  $\mu$ , radial and very finely punctate.







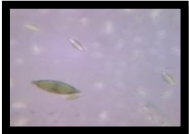








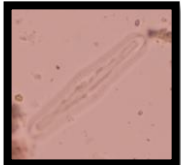
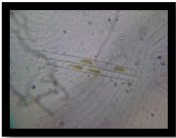

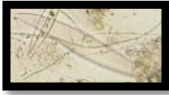
19. ***Gyrosigma scalproides*** (Rabenhorst) Cleve (fig.s)  
Tiffany, L. H. and Britton, M. E. 1952, Pg. 269.

Valves 50µm long, 10µm broad, Valves lanceolate, sigmoid, transverse striations perpendicular to the middle line, 22-24 in 10µm.

20. **Fragilaria construens** (Ehr.) Grun. var. *venter.f pusilla* (fig.q)  
 Sarode, P.T. & Kamat, N.D. 1984, Pg.26.

Frustules liner, attached together to form chain valves 12-14.5 µ long, 2.9-3 µ broad, pseudorape narrow, striae 14-16µ, strong.

Plate. 01. Identified diatoms genera from kinhi, Yeldari and Bamni sites (magnification 10 × 40 = 400).

			
a- <i>Synedra ulna</i>	b- <i>Nitzschia frustulum</i>	c- <i>Amphora rugosa</i>	d- <i>Frustulia jogensis</i>
			
e- <i>Stauroneis anceps</i>	f- <i>Navicula hungarica</i>	g- <i>Navicula cari and N. anglica</i>	h- <i>Cymbella affinis</i>
			
i- <i>Cymbella hungarica</i>	j- <i>Cymbella amphicephala</i>	k- <i>Gomphonema aequatoriale</i>	l- <i>Gomphonema subtile</i> .
			
m- <i>Gomphonema gracile</i>	n- <i>Mastogloia recta</i>	o- <i>Amphora ovalis</i>	p- <i>Achanthes andicola</i>
			
q- <i>Fragilaria construens</i>	r- <i>Navicula viridula</i>	s- <i>Gyrosigma scalproides</i>	

### Discussion:

In this research survey total 20 Bacillariophyceae members were recorded with 12 taxa. In this research study *Synedra*, *Navicula*, *Gomphonema* and *Cymbella* species were most dominant to all sites of Purna river basin. In this algal diversity study two species of *Ampora*, three species of *Navicula*, *Cymbella* and *Gomphonema* and one species *Synedra*, *Nitzschia*, *Mastogloia*, *Frustulia*, *Stauroneis*, *Achanthes* and *Gyrosigma* were recorded from kinhi, Yeldari and Bamni.

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