

# Diversity of Diatoms from Sulwade Barrage of river Tapti-II Dhule (M. S., India)

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## Abstract

Sulwade barrage located  $21.30^{\circ}$  N and  $74.80^{\circ}$  E on river Tapti of Dhule District. River Tapti shows variety of diatoms. Biodiversity of diatoms was studied for one year. Present article deals with twenty-one taxa belonging to seven genera of diatoms viz. *Achnanthes*- four species, *Caloneis*- two species, *Cymbella*- five species, *Gomphonema*- four species, *Mastogloia*- two species, *Neidium*- three species and *Surirella*- one species, occur abundantly in winter season. Brief notes and illustration are given for each species.

**Key Words:** Diatom, Sulwade barrage, Tapti.

## Introduction

The diatoms are one of the prominent and ecologically most significant group of microalgae on the earth. Diatoms probably represent one of the most diversified group among the algae, species of diatoms estimated to be between 10,000 and 1,00,000 (Round et al 1990).

Beginning of work on diatoms in India by Venkatraman (1939, 1956). He contributes on systematic account of South Indian diatoms. Later on, a major contribution in the field of diatoms by Gonzalves and Gandhi (1952-1954), Gandhi (1998), Sarode and Kamat (1984). In North Maharashtra Mahajan et al. (2004), Nandan et al. (2009) Patil (2016), Aher et al (2017) recorded diatoms. There is meager information on diversity of diatoms from river Tapti.

## Materials and Methods

The collections were made in winter season in the year 2016. Diatoms were collected by using plankton nets, water samples and mud were collected in plastic bottles and fixed with 4% Formalin.

Diatoms were cleaned by following Brun's method, then observed under microscope with 40X and 100X power for taxonomic study. Camera lucida drawings were made. Identifications were made by Gonzalves and Gandhi, 1953; Gandhi 1956, 1960; Sarode and Kamat 1984.

## Taxonomic Account

*Achnanthes elata* (Leud-Fort) Gandhi (Fig. 1)

Gandhi (1960)

Valves 28.5-33.5  $\mu$  long, 12.4-13  $\mu$  broad, fusiform, lanceolate, broadly tumid in the middle with sub cuneate rounded ends, raphe thin, straight, axial area wide, central area large, striae radial 10-11 in 10  $\mu$ .

***Achnanthes exigua*** Grun. (Fig. 2)

Hustedt (1930)

Valves 12-18  $\mu$  long, 5.6-6  $\mu$  broad, rectangular elliptical to almost in the middle portion, constricted at the ends, ends rostrate, axial area narrow, central area reaching the margins, striae about 21 in 10  $\mu$ , slightly radial, central area absent.

***Achnanthes inflata*** (Kuetz.) Grun. (Fig. 3)

Hustedt (1933)

Frustules broadly linear, bent in the middle in girdle view, valves 42.8-55  $\mu$  long, 12.2-16  $\mu$  broad, linear, delated in the middle, ends broadly rounded, raphe thin, straight, axial area narrow, central area stauroid, striae 11-12 in 10  $\mu$ , radial and punctate.

***Achnanthes minutissima*** (Kuetz.) Grun. (Fig. 4)

Hustedt (1933)

Frustules small, linear and bent in the girdle view, valves 19-32  $\mu$  long, 3-3.7  $\mu$  broad, narrow, linear lanceolate with broadly rounded, axial area narrow, central area slightly wider on raphe valves, striae 24-26 in 10  $\mu$  fine.

***Caloneis aequatorialis*** Hustedt v. ***tugelae*** Cholnoky (Fig. 5)

Cholnoky (1956)

Valves 29.8-33  $\mu$  long, 5.6-6.8  $\mu$  broad, linear lanceolate, somewhat inflated in the middle, very slightly constricted towards the both ends, ends broadly rounded, raphe thin with distinct central pores and curved terminal fissures, axial area broad, central area large, striae 22-24 in 10  $\mu$ , fine.

***Caloneis pulchra*** Messik. (Fig. 6)

Hustedt (1930)

Valves 45-58  $\mu$  long, 7.5-8.5  $\mu$  broad, gibbous in the middle, with broadly rounded ends, raphe thin and straight, axial area wide, linear lanceolate, central area large, lanceolate, striae 19-20 in 10  $\mu$ , fine.

***Cymbella affinis*** Kuetz. (Fig. 7)

Hustedt (1930)

Valves 17-36  $\mu$  long, 8.5-11.5  $\mu$  broad, asymmetrical, dorsal side strongly convex and ventral side slightly convex, ends constricted, raphe slightly thick, axile area narrow, sublinear, central area slightly widened, striae 10-12 in 10  $\mu$ .

***Cymbella cymbiformis* (Ag.) Kuetz. v. *cladostagensis* (Meist.) A. Cl. (Fig. 8)**

Cleve-Euler (1955)

Valves 71-79  $\mu$  long, 11.3-12.5  $\mu$  broad, sickle shape with convex dorsal margin and concave ventral margin, ends broadly rounded and truncate, raphe excentric with central pores, axial area narrow, central slightly widened, striae 8-10 in 10  $\mu$ , punctate and radial.

***Cymbella perpusilla* A. Cl. (Fig. 9)**

Cleve-Euler (1955)

Valves 15-23  $\mu$  long, 3-3.7  $\mu$  broad, distinctly asymmetrical, scarcely curved, obtuse ends, raphe slightly excentric, axial area narrow, central area small, striae 14-16 in 10  $\mu$  slightly radial.

***Cymbella pusilla* Grun. (Fig. 10)**

Hustedt (1930)

Valves 30-35  $\mu$  long, 7.6-7.9  $\mu$  broad, asymmetrical, dorsal margin slightly convex, ventral margin straight, ends slightly constricted, somewhat acutely rounded, raphe thin and straight, axial area narrow, central area slightly dilated and elliptical in long axis, striae 16-18 in 10  $\mu$ .

***Cymbella ventricosa* Kuetz. (Fig. 11)**

Hustedt (1930)

Valves 7.7-35  $\mu$  long, 3.7-7.8  $\mu$  broad, strongly convex on the dorsal side and straight on ventral side, acutely rounded ends, raphe thin and straight, axial area narrow, central area small, striae 10-14 in 10  $\mu$ .

***Gomphonema augur* Ehr. (Fig. 12)**

Hustedt (1930)

Valves 28.2-35  $\mu$  long, 9-9.5  $\mu$  broad, ovate, apiculate rounded apex, raphe thin and straight, axial area narrow, central area unilateral, striae slightly radial, 12-13 in 10  $\mu$ .

***Gomphonema dubravicense* Pant. (Fig. 13)**

Schmidt (1874-1959)

Valves 82-110  $\mu$  long, 12.2-15.5  $\mu$  broad, narrowly lanceolate, ends rounded, raphe thick and straight, axial area narrow, linear, central area wide, striae 8-10 in 10  $\mu$ , punctate.

***Gomphonema subapicatum* Fritsch and Rich (Fig. 14)**

Fritsch and Rich (1929)

Valves 55-60  $\mu$  long, 11-11.4  $\mu$  broad, lanceolate, sub apiculate apex, raphe thin and straight, axial area narrow, striae about 9-11 in 10  $\mu$ , radial, punctate.

***Gomphonema tenellum*** Kuetz. (Fig. 15)

Hustedt (1942)

Valves 14.2-16  $\mu$  long 3.8  $\mu$  broad, lanceolate clavate, rounded ends, raphe thin and straight, axial area narrow, central area wide with sigma on one side, striae about 18 in 10  $\mu$ , weakly radial.

***Mastogloia exigua*** Lweis f. *brevirostris* Venkat. (Fig. 16)

Venkatraman (1939)

Valves 29.5-35.5  $\mu$  long, 13.5-14  $\mu$  broad, elliptical, broadly rounded ends, raphe straight with slightly bent terminal fissures, axial area narrow, central area somewhat square, striae 12-14 in 10  $\mu$ , radial.

***Mastogloia recta*** Hustedt (Fig. 17)

Voigt (1956)

Valves 41.1-56.5  $\mu$  long, 13.5-14.2  $\mu$  broad, linear elliptical to linear lanceolate, produced, obtusely rounded ends, raphe thick, axial area narrow, linear, central area fairly large, rounded, striae 12-14 in 10  $\mu$ .

***Neidium affine*** (Ehr.) Cleve v. *longiceps* (Greg.) Cleve (Fig. 18)

Hustedt (1930)

Valves 20-24  $\mu$  long, 4.5-5.2  $\mu$  broad, linear with constricted broadly produced rounded ends, raphe thin and straight with central pores bent in opposite directions, axial area very narrow, central area small, striae 24-26 in 10  $\mu$ , finely punctate.

***Neidium indicum*** Gonzalves and Gandhi (Fig.19)

Gonzalves and Gandhi (1953)

Valves 50.8-65.6  $\mu$  long, 10.8-13  $\mu$  broad, linear with parallel or slightly convex margins, raphe thin and straight with central pore bent in opposite directions, terminal fissures bifurcated, axial area narrow, central area large, rhomboid, stria 22-24 in 10  $\mu$ .

***Neidium marathwadense*** Sarode and Kamat (Fig. 20)

Sarode and Kamat (1984)

Valves 28-30  $\mu$  long, 5.2-5.8  $\mu$  broad, linear lanceolate, obtusely capitate ends, raphe thin and straight, axial area narrow, central area broad reaching the margins, striae 30 in 10  $\mu$ , punctate.

***Suriella capronioides*** Gandhi (Fig. 21)

Gandhi (1960)

Valves 100-102  $\mu$  long, 39.4  $\mu$  broad, costae about 18 in 100  $\mu$ .

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**Figure Legends**

- 1) *Achnanthes elata* (Leud-Fort) Gandhi
- 2) *Achnanthes exigua* Grun.
- 3) *Achnanthes inflata* (Kuetz.) Grun.
- 4) *Achnanthes minutissima* (Kuetz.) Grun.
- 5) *Caloneis aequatorialis* Hustedt v. *tugelae* Cholnoky
- 6) *Caloneis pulchra* Messik.
- 7) *Cymbella affinis* Kuetz.
- 8) *Cymbella cymbiformis* (Ag.) Kuetz. v. *cladostagensis* (Meist.) A. Cl.
- 9) *Cymbella perpusilla* A. Cl.
- 10) *Cymbella pusilla* Grun.
- 11) *Cymbella ventricosa* Kuetz.
- 12) *Gomphonema augur* Ehr.
- 13) *Gomphonema dubravicense* Pant.
- 14) *Gomphonema subapicatum* Fritsch and Rich
- 15) *Gomphonema tenellum* Kuetz
- 16) *Mastogloia exigua* Lweis f. *brevirostris* Venkat.
- 17) *Mastogloia recta* Hustedt
- 18) *Neidium affine* (Ehr.) Cleve v. *longiceps* (Greg.) Cleve
- 19) *Neidium indicum* Gonzalves and Gandhi
- 20) *Neidium marathwadense* Sarode and Kamat
- 21) *Suriella capronioides* Gandhi



