

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

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## Abstract

Sulwade barrage located 21.30<sup>0</sup> N and 74.80<sup>0</sup> 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-two taxa belonging to five genera of diatoms viz. *Amphora*- five species, *Fragilaria*- five species, *Gyrosigma*- five species, *Pinnularia*- five species and *Synedra*- two species, occur abundantly in winter season. Brief notes and illustration are given for each species.

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

## Introduction

Diatoms are photosynthetic eukaryotic algae with siliceous cell wall. They are found in freshwater, marine water, soil, almost anywhere moist.

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

*Amphora australiensis* John (Fig. 1)

John (1983)

Frustules 15-18.8  $\mu$  long and 13-14.2  $\mu$  broad, broadly elliptical-lanceolate with truncate ends. Valves 15-18.8  $\mu$  long and 4-5  $\mu$  broad, semi lanceolate with dorsal side convex and ventral side slightly concave. Raphe thin and closer to ventral side, striae 20 in 10  $\mu$  on dorsal side, 24-26 in 10  $\mu$  on ventral side.

***Amphora coffeaformis*** Agardh (Fig. 2)

Hustedt (1930)

Valves 31.5- 52.7  $\mu$  long and 5.6-5.9  $\mu$  broad, raphe thin and closer to ventral side, weakly acute. Axial area very narrow, striae fine 18-22 in the middle and 25-26 in 10  $\mu$  towards ends, fine.

***Amphora fontinalis*** Hustedt (Fig. 3)

Hustedt (1930)

Frustules 14-25  $\mu$  long and 7-10  $\mu$  broad, elliptical with rostrate truncate ends. Valves 14-25.2  $\mu$  long and 3.4-4  $\mu$  broad, ends capitate. Dorsal striae 22-24 in 10  $\mu$ , 25-26 in 10  $\mu$  on ventral side, fine.

***Amphora ovalis*** Kuetz. v. *gracilis* (Ehr.) Cleve (Fig. 4)

Cleve-Euler (1953)

Frustules 61-64  $\mu$  long, 25.5-28  $\mu$  broad, elliptic with truncate ends in girdle view, valves lunate with convex dorsal side and concave ventral side, rounded ends, raphe arcuate, axial area very narrow, central area large, striae 12-13 in 10  $\mu$ .

***Amphora veneta*** Kuetz. (Fig. 5)

Hustedt (1930)

Frustules broadly elliptic, valves 14.2-21.3  $\mu$  long, 4.2-4.8  $\mu$  broad, strongly convex on the dorsal side and slightly concave on ventral side with inwardly bent rounded ends, raphe thin, close to ventral margin, striae 22-24 in 10  $\mu$  punctate.

***Fragilaria brevistriata*** Grun. v. *papillosa* A. Cl. (Fig. 6)

Cleve-Euler (1953)

Frustules rectangular, attached to form short chain, valves 15.5-17  $\mu$  long, 4.5-6.5  $\mu$  broad, linear elliptic to elliptic, abruptly tapering towards the ends, rounded, pseudoraphe elliptic, lanceolate, striae 14-15 in 10  $\mu$ , short and thick.

***Fragilaria capunica*** Dems. v. *artica* A. Cl. (Fig. 7)

Cleve-Euler (1953)

Valves 26-35  $\mu$  long, 2.9-3.5  $\mu$  broad, slender, sub-linear, narrow towards the ends, ends slightly constricted, pseudoraphe distinct, linear lanceolate, central area not formed, striae 16-18 in 10  $\mu$ , thick.

***Fragilaria construens*** (Ehr.) Grun (Fig. 8)

Cleve-Euler (1953)

Frustules linear, together forms short chains, valves 12-15  $\mu$  long, 2.8-3  $\mu$  broad, linear lanceolate, gradually tapering towards the ends, ends rounded, pseudoraphe narrow, linear, striae 14-16 in 10  $\mu$ , strong.

***Fragilaria intermedia*** Grun. (Fig. 9)

Hustedt (1930)

Frustules united together to form long bands, linear, rectangular in the girdle, valves 75-92  $\mu$  long, 6-7.7  $\mu$  broad, linear with parallel margins, ends tapering and rounded, axial area narrow, linear, striae 10-12 in 10  $\mu$ .

***Fragilaria ungeriana*** Grun. (Fig. 10)

Gandhi (1962)

Frustules in short chains, valves 55-73  $\mu$  long, 7.8-10  $\mu$  broad, linear, somewhat tapering, acutely rounded ends, pseudoraphe narrow, striae 12-15 in 10  $\mu$ .

***Gyrosigma acuminatum*** (Kuetz.) Rabh (Fig. 11)

Hustedt (1930)

Frustules solitary, valves 99-106  $\mu$  long, 11.9-12.8  $\mu$  broad, sigmoid, lanceolate, gradually tapering towards the ends, ends broadly rounded, raphe sigmoid and narrow, axial area narrow, central area small, elliptical, transverse and longitudinal striae at equal distance, striae 18-19 in 10  $\mu$ .

***Gyrosigma alternatum*** (Kuetz.) Rabh (Fig. 12)

Hustedt (1930)

Valves 206-236  $\mu$  long, 24-25  $\mu$  broad, narrowly sigmoid, lanceolate with gradually narrowed from the middle towards the poles, ends obtusely rounded, raphe central and sigmoid, axial area narrow, central area small and elliptical, transverse striae 13-14 in 10  $\mu$ , perpendicular to the middle line, longitudinal striae 11-12 in 10  $\mu$ .

***Gyrosigma bhusavalensis*** Sarode and Kamat (Fig. 13)

Sarode and Kamat (1984)

Valves 115-127  $\mu$  long, 22-23.5  $\mu$  broad, slightly sigmoid, linear, attenuated towards the poles with obliquely rounded ends, raphe central and sigmoid, axial area very narrow, central area small, elliptical, transverse striae 14-15 in 10  $\mu$ , longitudinal striae 17-18 in 10  $\mu$ , distinct.

***Gyrosigma scalpoides*** (Rabh.) Cleve (Fig. 14)

Hustedt (1930)

Valves 43.4-47.6  $\mu$  long, 8-9  $\mu$  broad, slightly sigmoid, linear and slightly attenuated towards the end, ends obliquely rounded, raphe central and sigmoid, axial area narrow, central area small, and narrow, transverse striae about 24 in 10  $\mu$ , longitudinal striae about 30 in 10  $\mu$ .

***Gyrosigma spencerii*** (W. Smith) Cleve v. ***nodiferum*** (Grun.) A. Cl. (Fig. 15)

Cleve- Euler (1953)

Valves 50.2-64  $\mu$  long, 10-12.8  $\mu$  broad, slightly sigmoid, linear lanceolate, somewhat narrowed towards the ends, ends rounded, raphe central, sigmoid, central area elliptical, transverse striae 18-20 in 10  $\mu$ , radial, longitudinal striae 24-26 in 10  $\mu$ , fine.

***Pinnularia brebissonii*** (Kuetz.) Cleve (Fig. 16)

Cleve-Euler (1955)

Valves 58-59.5  $\mu$  long, 14.5-15-8  $\mu$  broad, linear elliptical with subcuneate rounded ends, raphe thin and straight with unilaterally bent central pores and slightly curved terminal fissures, axial area fairly wide, linear lanceolate, central area large, rhomboid, striae 10-12 in 10  $\mu$ .

***Pinnularia crucifera*** A. Cl. v. ***subcapitata*** A. Cl. (Fig. 17)

Cleve-Euler (1955)

Valves 42-52  $\mu$  long, 7.5-7.8  $\mu$  broad, linear with parallel margins and slightly capitate ends, raphe thin and straight with unilaterally bent central pores and curved terminal fissures, axial area wide, linear, central area large, reaching the margins, striae 12 in 10  $\mu$ .

***Pinnularia episcopalis*** Cleve (Fig. 18)

Hustedt (1930)

Valves 80-85  $\mu$  long, 4-7  $\mu$  broad, sub elliptical with rounded ends, raphe thin, slightly bent, central pores somewhat hook like and terminal fissures slightly curved, axial area linear, central area somewhat quadrate, striae 8-9 in 10  $\mu$ .

***Pinnularia molaris*** Grun. (Fig. 19)

Hustedt (1930)

Valves 27-34.5  $\mu$  long, 5.5-6.5  $\mu$  broad, linear lanceolate with sub cuneate rounded ends, raphe thin and straight with curved terminal fissures, axial area quite narrow, central area large, rhomboid, reaching the margins, striae 14-16 in 10  $\mu$ , fine.

***Pinnularia notata*** (Perag. et Her.) A. Cl. v. ***rostrata*** A. Cl. (Fig. 20)

Cleve-Euler (1955)

Valves 25.4-33  $\mu$  long, 6.5-7.2  $\mu$  broad, linear with somewhat abruptly constricted, produced rounded ends, raphe thin and straight, axial area narrow, linear, central area large, reaching the margin, striae 12-13 in 10  $\mu$ .

***Synedra minuscula*** Grun. (Fig. 21)

Cleve-Euler (1953)

Valves 17.5-23  $\mu$  long, 3-4  $\mu$  broad, linear, lanceolate, with narrowed, rounded ends, axial area narrow, linear lanceolate, central area slightly widened, striae 14-15 in 10  $\mu$ .

***Synedra tabulata*** (Ag.) Kuetz. (Fig. 22)

Cleve-Euler (1953)

Valves 45.3-55  $\mu$  long, 3-4  $\mu$  broad, linear, narrow with tapering rounded ends, pseudoraphe slightly broad, central area absent, striae 12-14 in 10  $\mu$ , distinct.

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## Figure Legends

- 1) *Amphora australiensis* John
- 2) *Amphora coffeaformis* Agardh
- 3) *Amphora fontinalis* Hustedt
- 4) *Amphora ovalis* Kuetz. v. *gracilis* (Ehr.) Cleve
- 5) *Amphora veneta* Kuetz.
- 6) *Fragilaria brevistriata* Grun. v. *papillosa* A. Cl.
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- 16) *Pinnularia brebissonii* (Kuetz.) Cleve
- 17) *Pinnularia crucifera* A. Cl. v. *subcapitata* A. Cl.
- 18) *Pinnularia episcopalis* Cleve
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- 20) *Pinnularia notata* (Perag. et Her.) A. Cl. v. *rostrata* A. Cl.
- 21) *Synedra minuscula* Grun.
- 22) *Synedra tabulata* (Ag.) Kuetz.

