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### **Enumeration of Diatom Species Along the Coast of Vadhvan Maharashtra**

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#### **ABSTRACT**

Diatoms were collected for a period of 1 year from June 2017 to May 2018. The aim of present work is to study the Diatoms flora of Vadhvan coast, Maharashtra. The Vadhvan coast is situated in Dahanu Taluka of Palghar district 06 km away from Dahanu and about 140km North from Mumbai between approximate longitude  $19^{\circ}99'$  North and latitude  $72^{\circ}74'$  East. The coast is full of live Molluscan species. In all 16 genera belonging to 24 species of central and pinnate diatom were identified and listed as: Cyclotella, Coscinodiscus, Actinocyclus, Biddulphia, Fragillaria, Auriculopsis, Licmophora, Cocconeis, Navicula, Pinnularia, Rhopalodia, Amphora, Cymbella, Okedonia, Surirella and Campylodiscus.

**KEYWORDS:** Centrales, Diatom, Phytoplankton, Pinnales Vadhvan.

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## INTRODUCTION

The oceans cover more than 70% of the surface of the Earth. They produce a large fraction of atmospheric O<sub>2</sub> and provide a critical sink for CO<sub>2</sub>. Remarkably, the microscopic component of ocean life, with representatives covering five orders of magnitude in size from viruses, bacteria, archaea and eukaryotes, represents 98% of oceanic biomass. These organisms perform essential planetary-scale functions as part of the microbial loops, as the base of oceanic food webs, in the biological carbon (C) pump in primary production.<sup>1,2</sup> Algae are predominantly aquatic photosynthetic eukaryotes that range from unicells of a few microns in diameter to complex multicellular forms that can reach tens of meters in length.<sup>3</sup> Algal evolution was dependent on the acquisition of oxygenic photosynthesis by cyanobacteria approximately 2.4 billion years ago.<sup>4</sup>

## LITERATURE REVEIW

Plankton composition in two estuaries of Konkan coast was studied by Adebixi 1981)<sup>5</sup>. Information on the phytoplankton of west coast of India is very little like Fluxes of diatoms in Dona Paula bay was done by Anila Garg and Bhaskar (2000).<sup>6</sup> Ragothaman and Saroj Patel studied on hydrobiology of Dandi and Onjal from south Gujarat (2002).<sup>7</sup> Phytoplankton from polluted and unpolluted environments of few locations of Bombay was studied by Ram (1985).<sup>8</sup> Hydrobiological study of Nandgaon and Dahanu coast was carried out by Shilpa Patel (2002).<sup>9</sup> No literature is found about study of marine diatoms from Vadhvan coast of Maharashtra.

Present study was aimed at investigating the diatom flora of Vadhvan which will provide baseline information for future monitoring of the marine ecosystem considering the urbanization and industrial growth around the coast and particularly after the construction of proposed port.

## MATERIAL AND METOHD

The aim of present study the Diatoms flora of Vadhvan coast, Maharashtra.

The Vadhvan coast is situated in Dahanu Taluka of Palghar district ,06 km away from Dahanu and about 140km North from Mumbai between approximate longitude 19<sup>0</sup>.99', North and latitude 72<sup>0</sup>.74', East. The coast is full of live Molluscan species.

Government of Maharashtra is planning to construct huge port on the coast. Nobody has yet studied Diatom flora of the coast. The study was done for the period of one year from June 2017 to May 2018.

Water samples were collected once in month between 6.00 a.m. to 8.30 a.m. For collecting the phytoplankton conical bolting silk plankton net 20 mesh was used. Sampling spots were kept constant throughout the study.

### ***Preservation of plankton material***

200ml of known quantity of plankton sample was preserved in 4% formalize with few drops of iodine.

### ***Acid treatment method for clearing the diatoms***

From the preserved plankton samples, 20ml was taken in a beaker and 25 to 30 ml concentrated H<sub>2</sub>SO<sub>4</sub> was added. The material was kept for 2-3 days and sample was heated. While heating fumes appeared from the beaker. A pinch of KNO<sub>3</sub> was added. The solution turned to colorless and after cooling distilled water was added and washed for 2 to 3 times with centrifuge machine. The centrifuge samples were preserved in 70% alcohol.

### ***Preparation of permanent slide for diatoms***

From the preserved acid treated diatoms material in the 70% alcohol, one drop was taken on the cover glass and allowed to burn on flame of spirit lamp for drying and cooled. Added one drop of DPX mountant o the center of the slide, then cover glass having diatoms material was kept on the slide and finally the slide was kept in the incubator for removing air bubbles and this was the permanent slide for the identification of diatoms.

From the permanent slides of different collection, microphotographs of diatoms were taken on “photomicroscope – Nikon E100 (Japan)” attached with Nikon DSLR 7200 Camera.

All the plankton were identified with the help of standard books and journals: - Cupp – 1943<sup>10</sup>, Hajos – 1976<sup>11</sup>, Hendey – 1964<sup>12</sup>, Husted -1930<sup>13</sup> and Subramanyan – 1946<sup>14</sup>.

## **RESULTS**

In all 16 genera of belonging to 24 central and pinnate diatom species were identified and are listed as:

***Cyclotella, Coscinodiscus, Actinocyclus, Biddulphia, Fragillaria, Auriculopsis, Licmophora, Cocconeis, Navicula, Pinnularia, Rhopalodia, Amphora, Cymbella, Okedonia, Surirella and Campylodiscus.***

All 24 species were identified and represented as Figures 1 - 24

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## Enumeration of Diatoms

**Fig. 1.** *Cyclotella caspia*. Grunow

**Fig 2.** *Coscinodiscus joergensenni* (Ostenfeld)

**Fig 3.** *Coscinodiscus lineatus* (Ehrenberg)

**Fig 4.** *Coscinodiscus spiralis* n. sp. (Hajos).

**Fig 5.** *Coscinodiscus symbolophorus*

- Fig 6. *Actinocyclus roperia* (de Brebisson) Grunow  
Fig 7. *Biddulphia heteroceros* Grunow  
Fig 8. *Biddulphia mobiliensis* Baley  
Fig 9. *Fragilaria brevisstrata* Grunow. Forms. elongate f. nov.  
Fig 10. *Auriculopsis sparsipunctata spec.nov.*  
Fig 11. *Licmophora abbreviate* (Agardh)  
Fig 12. *Cocconeis disculus* (Schumann)Cleve.  
Fig 13. *Cocconeis disculoides* Hustedt.  
Fig 14. *Cocconeis placentula* Ehrenberg var euglypta (Her.) Cleve.  
Fig 15. *Navicula fimarchia* (Cleve and Grunow) Cleve.  
Fig 16. *Navicula leterostrata* Hust.  
Fig 17. *Navicula minima* grun var atomoides (Grun) Cleve.  
Fig 18. *Pinnularia cruciformis* (Donkin) Cleve.  
Fig 19. *Rhopalodia gibberula* var. **producta** (Grunow) Cleve  
Fig 20. *Amphora coffeaeformis* (Agrardh) Kutzing var. *coffeaeformis*  
Fig 21. *Cymbella marina*  
Fig 22. *Okedonia inflexa* (de Brebisson ex Kutzing) de Toni  
Fig 23. *Surirella hispida* (Ross and Abdin)  
Fig 24. *Campylodiscus iyengarui* sp. Nov.

## Diatom photographs



Fig 1



Fig 2



Fig 3

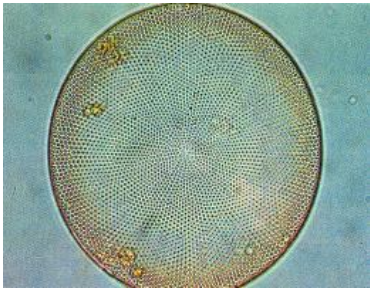


Fig 4

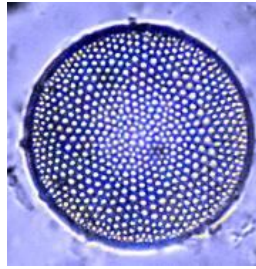


Fig 5



Fig 6



Fig 7



Fig 8



Fig 9

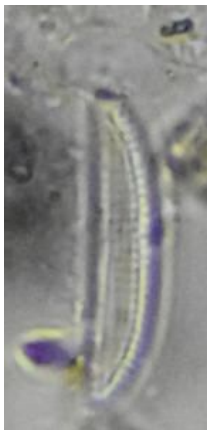


FIG 10

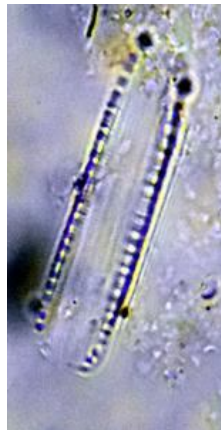
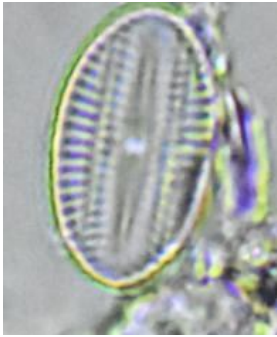


Fig 11



Fig 12



**Fig13**



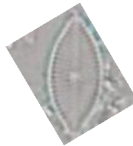
**Fig 14**



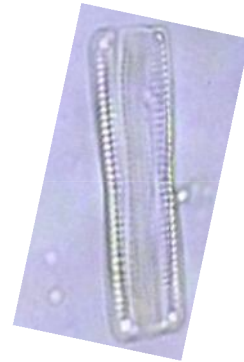
**Fig 15**



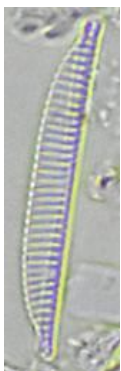
**Fig 16**



**Fig 17**



**Fig 18**



**Fig 19**



**Fig 20**



**Fig 21**



Fig 22

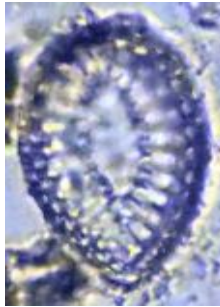


Fig 23



Fig 24

Scale bar represents -  
Dimensions 10  $\mu$

A 

B 