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Diversity of Biddulphia Diatoms along the coast of Gholvad and Tarapur, Maharashtra, India

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ABSTRACT

Diatoms were collected for a period of 2 years from June, 2016 to May 2018. Tarapur is 115 km North of Mumbai at Latitude: 19.85^0N Longitude: 72.70^0E latitude. Tarapur atomic Power Station is 2 km from this site. Gholvad is situated 140 km North of Mumbai at 20°5′31"N Longitude 72°43′57"E Latitude. In all 17 species of Biddulphia are reported from bot coasts.

Key words: Diatoms , Gholvad, Tarapur, Divrsity of Diatoms

Introduction

Beautiful aquatic protists—perhaps 10,000 living species—-diatoms are single cells or form simple filaments or colonies. Some 250 genera of these gorgeous protoctists are commonly described, and specialists recognize as many as 100,000 species, including those in 70 fossil genera. Valves, the two parts of the diatom test (shell), extend into the Mesozoic fossil record; the first ones appeared in the lower Cretaceous period.

Each valve of the diatom test is composed of pectic organic materials impregnated with silica (hydrated SiO_2), in an opaline state. The valves may be extremely elaborate and beautiful; their elegantly symmetrical patterns are used to test lenses for optical aberrations. Diatoms require dissolved silica for growth; they are so competent at the removal of silica from natural waters that they can reduce the concentration to less than one part per million, below the value detectable by chemical techniques.

Diatoms, important at the base of marine and freshwater food chains, are very widely distributed in the photic (illuminated) zones of the world. Some species are found in hypersaline ponds and lagoons, others in clear freshwater, and others in moist soil. Their cysts, empty tests, and dying cells can be found in unlighted regions of the ocean. Most species under study are obligate photosynthesizers, although some also require organic substances, such as vitamins, for growth. Some strains of *Nitzschia putrida* are saprobes.

Diatoms are generally brownish; for years, they were classified with the golden yellow algae, the chrysomonads (Pr-15). The xanthoplasts (plastids) of diatoms contain the pigments chlorophyll *a*, chlorophyll *c*, beta-carotene, and xanthophylls, including fucoxanthin, lutein, and diatoxanthin. The photosynthetic food reserve of diatoms, like that of chrysomonads, is the oil chrysolaminarin. Nevertheless, in life history, cell structure, and division, the diatoms differ greatly from the other golden yellow algae. The diatoms make up such an easily distinguished and large natural group that, in light of modern information, we provide them a phylum separate from the other organisms that have golden brown plastids.

The two great classes of diatoms are the Coscinopiscophyceae (Centrales) and the Bacillariophyceae (Pennales). The

Coscinopiscophyceae, or centric diatoms, have radial symmetry, like that of *Thalassiosira* and *Melosira*. The Bacillariophyceae, or pennate (featherlike) diatoms, have bilateral symmetry; many of them are boat-shaped or needle-shaped. The pennate diatom has a slit, called a raphe, between the valves. The raphe exudes cytoplasmically produced slime in which the diatom glides. The centric diatoms lack raphes and are never motile. In spite of the correlation of the raphe and movement, the detailed mechanism of gliding in the pennate diatoms is not known. The centric diatoms usually have numerous small plastids, whereas in the pennate diatoms, the plastids are fewer, as a rule, and larger.

Materials and Metohd

Diatoms were collected for a period of 2 years from June, 2016 to May 2018. Tarapur is 115 km North of Mumbai at Latitude: 19.85^{0}N Longitude: 72.70^{0}E latitude. Tarapur atomic Power Station is 2 km from this site. Gholvad is situated 140 km North of Mumbai at 20°5′31"N Longitude 72°43′57"E Latitude.

Plankton sample were collected once in a month between 6.00 am to 8.30 am with the help of a conical bolting silk plankton net having 20 number.

Samples were preserved with 4 % formalin with few drops of iodine. Acid treatment method was used to clear diatom, for that, 20 mL of plankton sample was taken and 25 to 30 mL of conc. H_2SO_4 was added. The material was kept for 2 to 3 days and same was heated, adding a pinch of KNO_3. After cooling washed with Distilled water for 2 to 3 times and centrifuged. The centrifuged samples were preserved in 70 % alcohol.

Permanent mountant was prepared in DPX and microphotograph (Nikon D7200 camera) of diatoms were taken using “Photomicroscope” (Nikon E100).

Results

Results are shown in Table 1 and photographs in Plate I to Plate VII.

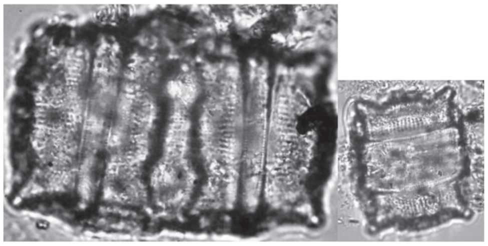
Conclusion

In all 17 species of Biddulphia were recorded from both sites.

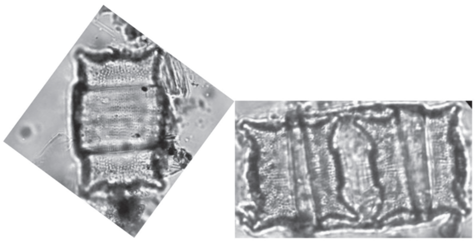
Table 1. Names of Biddulphia sps. as per plate and Figure numbers

Figure No.	Names	Scale represents10µ
	Plate I	
1a,1b,1c,1d,1e,1f,1g	*Biddulphia* aurita (Lyngbye) Brebisson and Godey	100X
	Plate II	
2a,2b,2c	*Biddulphia biddulphiana* (Smith) Boyer	100X
	Plate III	
3a,3b,3c,3d,3e	*Biddulphia dubia* (Brightwell) Cleve	100X
4a,4b	*Biddulphia longicruris* Greville	100X
	Plate IV	
5	*Biddulphia* pulchella Gray	100X
6a,6b	*Biddulphia* regia (M. Schultze) Ostenfeld	100X
	Plate V	
7a	*Biddulphia* tridens	40x
7b	*Biddulphia* tridens	100x
	Plate VI	
8a,8b,8c,8d,8e	*Biddulphia mobliensis* Bailey	100X
9a,9b	*Biddulphia heteroceros*	100X
	Plate VII	
10a,10b,10c	*Biddulphia rhombus* (Ehrenberg) W Smith Forma rhombus	100X
11	*Biddulphia* sps	100X
12	*Biddulphia* sps	100X
13a13b	*Biddulphia* sps	100X
14	*Biddulphia* sps	100X
15	*Biddulphia* sps	100X
16	*Biddulphia* sps	100X
17	*Biddulphia* sps	100X

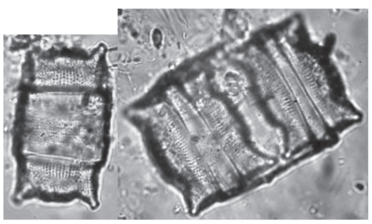
PLATE I



1a 1b



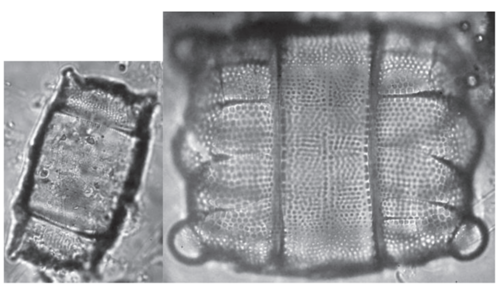
1c 1d



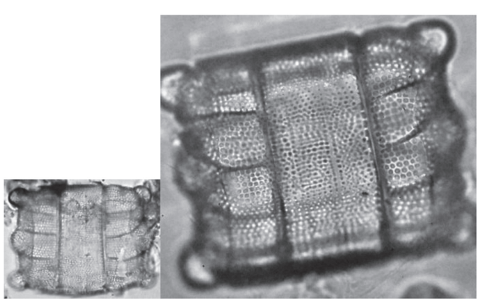
1 e 1f

Scale bar represents Dimension 10 μ
100x
40x

PLATE II



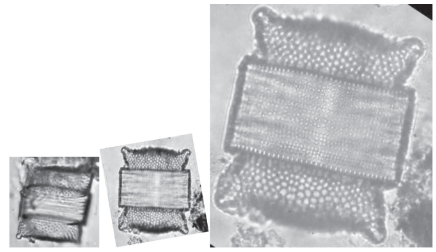
1g 2b



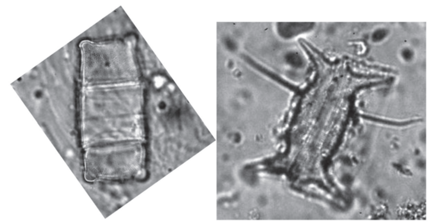
2a 2c

Scale bar represents Dimension 10 μ
100x
40x

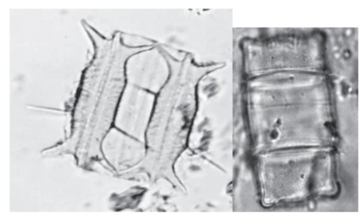
PLATE III



3 a 3b 3c



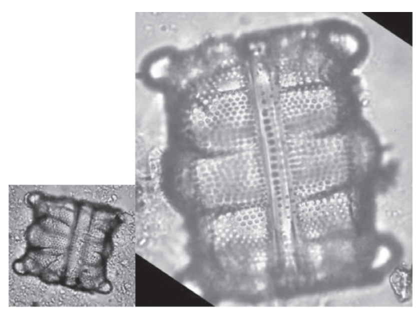
3d 4b



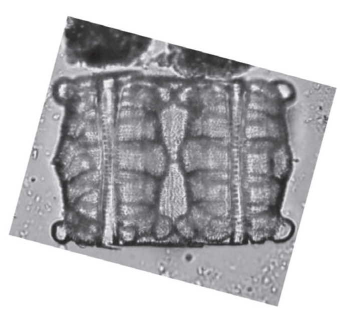
4a 3e

Scale bar represents Dimension 10 μ
100x
40x

PLATE IV



5 6b



6a

Scale bar represents Dimension 10 μ
100x
40x

PLATE V

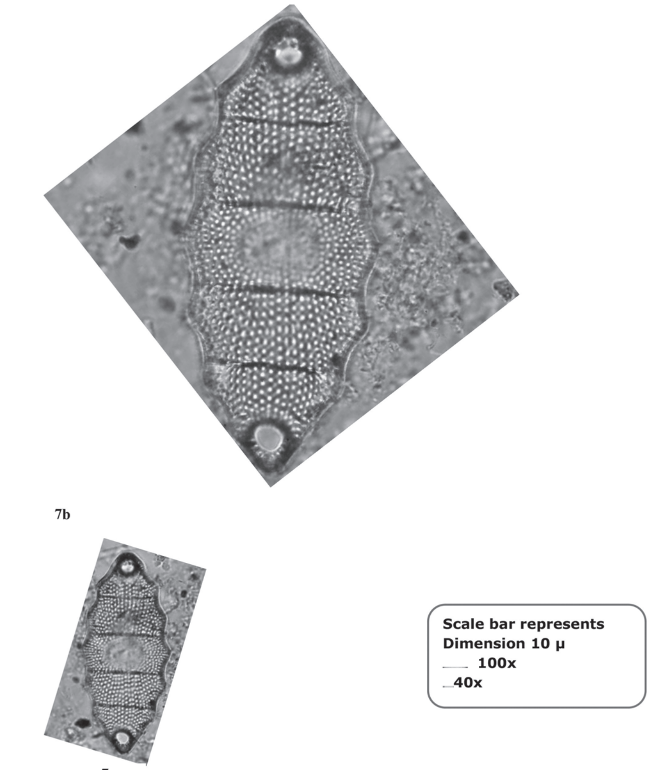


PLATE VI

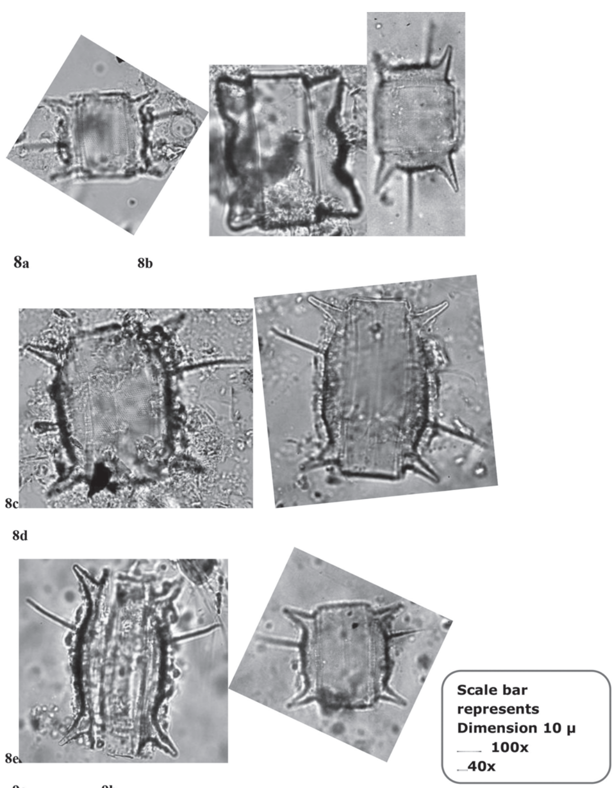
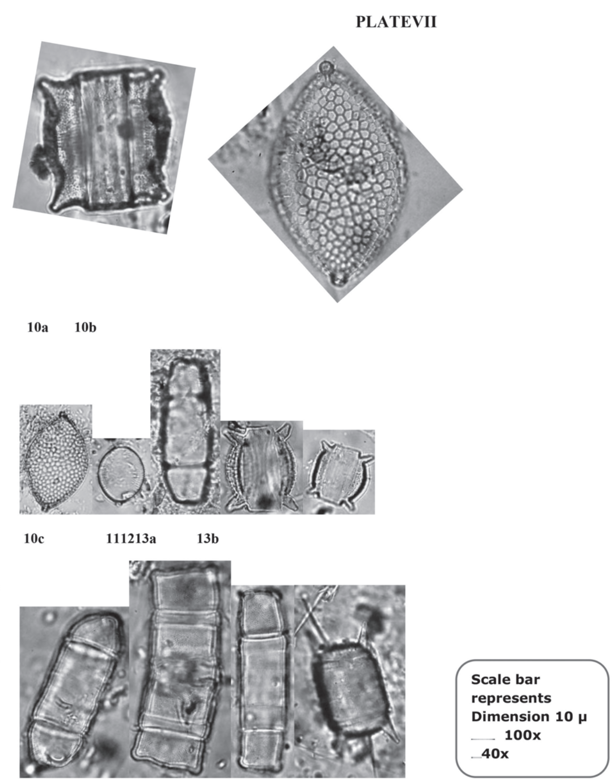


PLATE VII



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