RESEARCHS / INVESTIGACIÓN

Diatom of Escape Bay in Myeik Archipelago, Southern Taninthayi Coast of Myanmar.

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Abstract: A total of 53 species of diatom comprised 32 genera in the present study. The highest species composition (36 species) was found in July (monsoon season) and November (post-monsoon season), and the lowest number (23 species) was also found in October (post-monsoon season). *Eucampia cornuta, Chaetoceros pervianum, C. compressus*, and *Surirella ovalis* occurred rarely.

Key words: Diatoms, identification, species composition, Escape Bay, Taninthayi Coast, Myanmar.

Introduction

Marine phytoplankton is made up of small plants, mostly microscopic in size and unicellular. Phytoplankton can be separated based on cell size into micro-phytoplankton (200–20 µm), nano-phytoplankton (20–2 µm), and pico-phytoplankton (2–0.2 µm). Phytoplankton is commonly composed of both eukaryotic and prokaryotic species. It colonizes the upper part of the water column, down to the limit of penetration of light. The structure and abundance of the phytoplankton populations are mainly controlled by inorganic nutrients such as nitrogen, phosphorus, silica, and iron. Phytoplankton populations are controlled by grazing and viral mortality, as well as nutrient availability and other biological and physicochemical factors.

In the phytoplankton, Diatoms (Order: Bacillariophyceae) and Dinoflagellates (Order: Dinophyceae) commonly predominate. Diatoms (Bacillariophyta) are remarkedly distinguishable into two orders, the Centrales and the Pennales.

Diatoms (Bacillariophyta) are remarkedly distinguishable into two orders, the Centrales and the Pennales. The Centrales, or centric diatoms, have radial symmetry and are thriving as plankton in marine waters. Their frustules, or shells, can also be triangular or quadrate. The centric diatoms are mostly planktonic and non-motile. (as cited in Hunter)[1]. The Centrales are divided into three major groups based on cell shape and are the presence or absence of particular processes. Genera such as *Coscinodiscus, Cyclotella*, and *Melosira* are disc-shaped with no means, whereas the valve surfaces of families such as *Biddulphia* and *Chaetoceros* have various horns. The third group containing genera such as *Rhizosolenia* and *Corethron* also have a complex girdle structure (Dhargalkar and Ingole[2]). Escape Bay was developed with pearl oyster (*Pinctada maxima*) farms. The objective of the present study is to identify phytoplankton species in Escape Bay (pearl oyster farming area).

Materials and methods

Diatom samples were collected monthly from sampling station Escape Bay (Lat 12° 16' N and Long 98° 00' E), in the waters off Elphinstone Island, MyeikArchipelago, Taninthayi Region during June 2013 to February 2014. Phytoplankton net (60cm in length, 25cm in width (diameter) and 25 µm mesh size) was towed horizontally at every station. The collected samples were kept in clean small size plastic bottles and preserved in 2% formaldehyde immediately. Diatom samples were deposited in the Department of Marine Science, Myeik University. The specimens were identified up to species level with the following references; Newell and Newell[3], Allen and Cupp[4], Hendey[5], Yamaji[6], Tomas[7], Wood[8] and Al-Kandari, Al-Yamani and Al-Rifaie[9].

Results and Discussion

In the present study, a total of 53 species of diatom belonging under 32 genera under 16 families of 2 orders were recorded. The families of diatoms included *Thalassiosiraceae, Melosiraceae, Leptolindraceae, Coscinodiscaceae, Rhizosoleniaceae, Hemiaulaceae, Chaetocerotaceae, Lithodesmaceae, Eupodiscaceae, Fragilariaceae, Thalassionemataceae, Naviculaceae, Bacillariaceae, Sururellaceae*, and *Diatomaceae*, respectively.

During the study period, the systematic identification of diatom was made based on the references; Newell and Newell[3], Allen and Cupp[4], Hendey[5], Yamaji[6], Tomas[7], Wood[8] and Al-Kandari, Al-Yamani and Al-Rif[9], Thu Hein[10], Khin Yu Nwe[11] and Lett Wai Nwe[12].

During the whole study period, monthly diatom species composition was ranged from 23 to 36 (Table 1). The highest number 36 of diatom species was found in July and November. However, minimum species number 23 was found in October that was post-monsoon season. The species *Coscinodiscus occulus-irridis, Rhizosolenia imbricata, R. setigera, Bacteriastrum hyalium, Ditylum sol, Odontella sinensis, Thalassionema nitzschioides* and *Pleurosigma normanii* are commonly occurred every month. *Eucampia cornuta* was found only in June. Besides, *Chaetoceros pervianum, C. compressus* and *Surirella ovalis* were occurred only in July. The species mentioned above were rarely observed during study period.

In Myeik Archipelago, Si Thu Hein[10], Khin Yu Nwe[11] and Lett Wai Nwe[12] reported that diatoms are dominantly found in their study periods. Moreover, Zin Mar Aye[13] and Tin Tin Kyu[14] reported that diatoms were higher than dinoflagellates in Palaw Waters. Thida Nyunt[15] reported 99 species of diatoms from Mon Coastal Waters. Yin Yin Htay[16] identified 116 species of diatoms from Myeik Coastal Waters. Khin Khin Gyi 17 described 155 species of diatoms from Myeik Coastal Waters. In Khin Khin Gyi[17], the genera; *Coscinidiscus, Hemidiscus, Rhi-*

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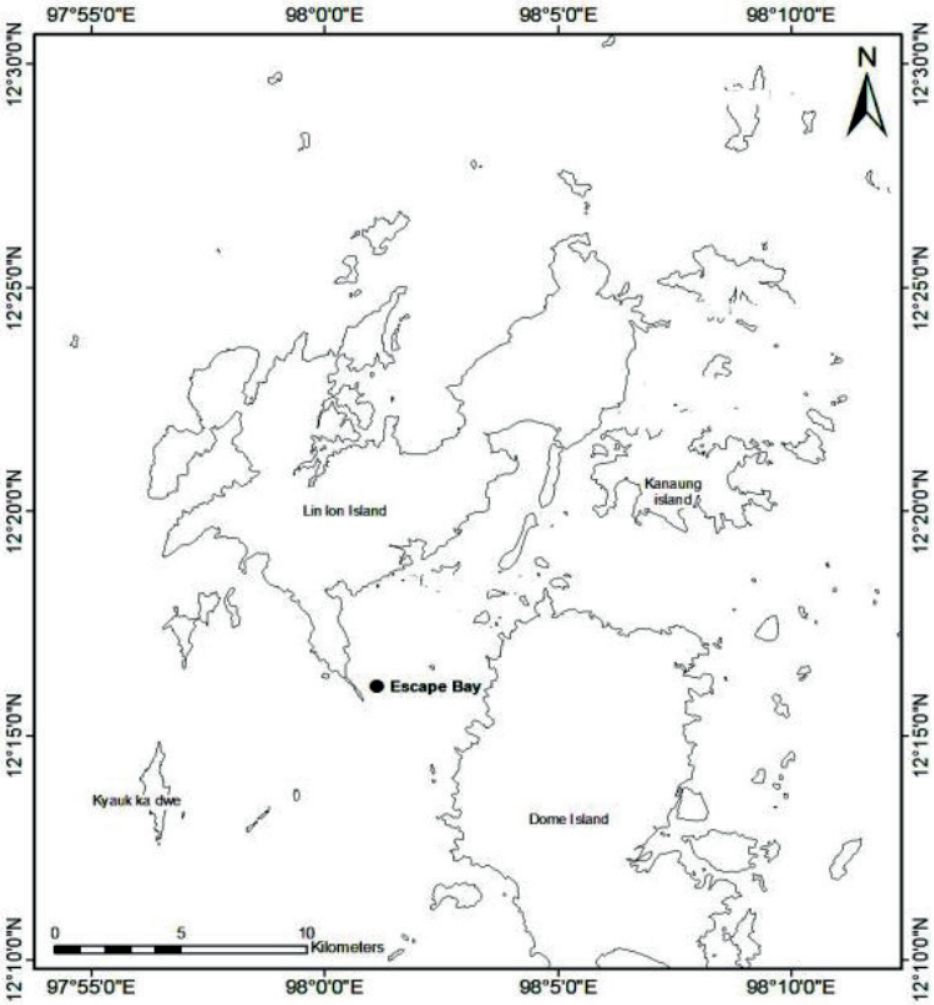

Figure 1. Map showing the study area.

Sr. No	Species Name	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
1	*Cyclotella striata*	-	-	-	+	-	-	+	-
2	*Lauderia annulata*	+	-	+	+	+	+	+	+
3	*Skeletonema costatum*	-	-	-	-	+	-	+	-
4	*Planktoniella sol*	-	-	+	+	-	+	+	-
5	*Thalassiosira eccentriaca*	+	+	-	-	-	-	-	-
6	*Paralia sulcata*	-	-	-	+	-	+	-	-
7	*Corethron criophilum*	-	+	-	-	-	+	+	-
8	*Coscinodiscus centralis*	-	+	+	+	-	-	-	-
9	*C. occulus-irridis*	+	+	+	+	+	+	+	+
10	*C. granii*	+	+	+	+	+	+	+	-
11	*C. radiatus*	-	-	-	-	+	+	-	-
12	*Hemidiscus cuneiformis*	+	+	+	+	-	+	+	+
13	*Rhizosolenia imbricata*	+	+	+	+	+	+	+	+
14	*R. setigera*	+	+	+	+	+	+	+	+
15	*R. robusta*	+	+	+	+	-	+	+	+

Table 1. Species composition of diatom of Escape Bay during study period.

16	*R. calcar-avis*	+	+	-	-	-	+	+	+
17	*R. bergonii*	+	+	-	-	+	-	-	-
18	*Proboscia alata*	+	+	+	-	-	+	+	+
19	*Guinardia striata*	-	-	-	-	-	+	-	+
20	*G. flaccida*	+	-	+	+	-	+	-	+
21	*Eucampia zodiacus*	+	-	+	-	-	+	-	-
22	*E. cornuta*	+	-	-	-	-	-	-	-
23	*Cerataulina pelagica*	+	+	+	+	-	+	-	+
24	*Hemiaulus sinensis*	+	+	-	-	+	+	-	+
25	*Bacteriastrum hyalium*	+	+	+	+	+	+	+	+
26	*Chaetoceros decipiens*	+	+	+	-	+	-	+	+
27	*C. curvisetum*	+	+	+	-	+	-	+	+
28	*C. diversus*	+	+	+	+	-	+	+	-
29	*C. denticulatus*	+	+	-	-	-	+	-	-
30	*C. coastatus*	-	-	-	-	+	+	-	+
31	*C. pervianum*	-	+	-	-	-	-	-	-
32	*C. compressus*	-	+	-	-	-	-	-	-
33	*Bellerochea horologicalis*	+	-	-	-	+	-	-	-
34	*Ditylum sol*	+	+	+	+	+	+	+	+
35	*Helicotheca thamensis*	-	+	+	+	-	-	+	-
36	*Odontella sinensis*	+	+	+	+	+	+	+	+
37	*O. mobiliensis*	+	-	+	+	+	+	+	-
38	*O. aurita*	+	-	-	+	-	-	+	-
39	*Triceratium favus*	-	+	-	+	+	+	-	+
40	*Lamprisuss hadboltianum*	+	+	+	+	+	-	+	-
41	*Astrionellopsis glacialis*	-	+	-	-	-	-	+	-
42	*Thalassionema nitzschioides*	+	+	+	+	+	+	+	+
43	*T. frauenfeldii*	+	+	+	+	-	+	+	-
44	*Pleurosigma normanii*	+	+	+	+	+	+	+	+
45	*P. angulatum*	-	-	-	+	+	+	+	-
46	*P. elongatum*	-	-	-	-	-	+	+	+
47	*Amphiprora alata*	-	+	+	+	-	+	+	+
48	*Bacillaria paxillifera*	+	+	-	+	-	+	+	+
49	*Nitzschia longissigma*	+	+	+	+	+	+	+	+
50	*N. lorenzian*	-	-	-	+	-	+	+	-
51	*Pseudo-nitzschia seriata*	+	+	+	+	-	+	+	+
52	*Surirella ovalis*	-	+	-	-	-	-	-	-
53	*Tabellaria fenestratea*	-	+	-	+	-	-	-	-
	Total	33	36	28	33	23	36	34	26

Table 1. Species composition of diatom of Escape Bay during study period.

zosolenia, Proboscia, Guinardia, Eucampia, Ditylum, Odentella, Thalassionema, Nitzschia were found as dominantly. Her finding was similar to the present study. However, Zin Lin Khine and Htay Aung[18] described dinoflagellates occurred to be more abundant than diatoms in the waters off Ayeyarwaddy and Taninthayi coast.

Boonyapitwat[19] recorded that *Oscillatoria erythrae, Proboscia alata, Rhizosolenia calcar-avis*, and T*halassionema frauenfeldii* were dominant species in Vietnamese. Zin Lin Khin and Htay Aung[20] also recorded that *Osciallatoria* was dominant species in lower part of Taninthayi Waters. Moreover, Boonyapitwat, *et al.*[21], reported *Oscillatoria erythrae* and *Proboscia alata* were the dominance species in north, west, and east of the Bay of Bengal. However, the genus *Oscillatoria*

Figure 2. Photographs of phytoplankton species (1) *Cyclotella striata*; (2) *Lauderia annulata*; (3) *Skeletonema costatum*; (4) *Planktoniella sol*; (5) *Thalassiosira eccentrica*; (6) *Paralia sulcata*; (7) *Corethron criophilum*; (8) *Coscinodiscus occulus-irridis*;(9) *C. centralis*; (10) *C. granii*; (11) *C. radiatus*; (12) *Hemidiscus cuneiformis*; (13) *Rhizosolenia imbricata*; (14) *R. setigera*; (15) *R. robusta*; (16) *R. calcar-avis*; (17) *R. bergonii*; (18) *Proboscia alata*; (19) *Guinardia flaccida*; (20) *G. striata*; (21) *Eucampia zodiacus*; (22) *E. cornuta*; (23) *Cerataulina pelagica*; (24) *Hemiaulus sinensis*; (25) *Bacteriastrum hyalium*; (26) *Chaetoceros decipiens*; (27) *C. curvisetum*; (28) *C. diversus*; (29) *C. denticulatus*;(30) *C. coastatus*;(31) *C. pervianum*; (32) *C. compressus*; (33) *Bellerochea horologicalis*; (34) *Ditylum sol*; (35) *Helicotheca tamensis*; (36) *Odontella sinensis*; (37) *O. mobiliensis*; (38) *O. aurita*; (39) *Triceratium favus*; (40) *lampriscus shadboltianum*; (41) *Astrionellopsis glacialis*; (42) *Thalassionema nitzschioides*; (43) *T. frauenfeldii*; (44) *Pleurosigma nomanii*; (45) *P. angulatum*; (46) *P. elongatum*; (47) *Amphiprora alata*; (48) *Bacillaria paxillifera*; (49) *Nitzschia longissigma*; (50) *N. lorenzian*; (51) *Pseudo-nitzschia seriata*; (52) *Surirella ovalis* and (53) *Tabellaria fenestratea*.

(Trichodesmiun) was not found, but *T. frauenfeldii* and *P. alata* were found moderately in the present study. Besides, Zekaria and Soe Tint[22] recorded *Coscinodiscus, Rhizosolenia*, and *Chaetoceros* were located dominantly in the near Taungpyoe Village, Myeik. The genera *Coscinodiscus*, *Chaetoceros*, and *Odontella* found dominating the phytoplankton species from nearshore waters of Gwa were recorded by Kyaw Win and Nay Win[23]. Besides, Maung Maung Myint, Aung Myint and Saw Han Shein[24] found that *Coscinodiscus*, *Rhizosolania*, *Chaetoceros*, and *Odontella* were dominant genera around Gwa, Kyaukphyu, and Sittway. Likewise, the genera mentioned above were observed commonly in the present study. Figure 2

Conclusions

In the present study, diatoms were dominantly found during the current research. The maximum species composition of diatom was found in monsoon and post-monsoon season. The study area (Escape Bay) was productive during survey period. The present study was conducted at monsoon and post-monsoon season. So, pre-monsoon season was studied in the future. The results obtained were not significantly influenced by monthly. Therefore, the abundance of diatoms was right and to success pearl oysters' culture. It can be concluded that the study waters were highly productive areas.

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