ELSEVIER

Marine Pollution Bulletin

Certificate of Reviewing

Awarded for 1 review in June 2024
presented to

ROZIRWAN ROZIRWAN

in recognition of the review contributed to the journal

The Editors of Marine Pollution Bulletin

Elsevier Reviewer Recognition

Rozirwan unsri <rozirwan@unsri.ac.id>

Reviewer Invitation for MPB-D-23-00629

1 pesan

Marine Pollution Bulletin <em@editorialmanager.com> 31 Mei 2024 pukul 07.50
Balas Ke: Marine Pollution Bulletin <support@elsevier.com>
Kepada: Rozirwan Rozirwan <rozirwan@unsri.ac.id>

Ms. Ref. No.: **MPB-D-23-00629**
Title: PHYTOPLANKTON COMMUNITY STRUCTURE IN TUNDA ISLAND WATERS, BANTEN INDONESIA AS A BIOINDICATOR TO MEASURE WATER QUALITY
Marine Pollution Bulletin

Dear Dr. Rozirwan Rozirwan,

A paper has been submitted to Marine Pollution Bulletin on which I hope you will be able to offer an opinion.

This journal currently has a rejection rate of about two-thirds of submissions. What this means is that the views of the referee of this paper are especially important.

Your comments, which will be anonymous, will be sent to the author(s). I do not have a special form, as most reviewers don't use them anyway, so please feel free to write comments in any way you find most convenient.

PLEASE DO NOT USE YOUR E-MAIL "REPLY" OPTION TO RESPOND TO THIS INVITATION.

The abstract is attached below.

You should treat this invitation, the manuscript and your review (as well as other reviewer comments shared with you) as confidential. You must not share your review or information about the review process with anyone without the agreement of the editors and authors involved, irrespective of the publication outcome. If the manuscript is rejected by this journal and the author agrees that the submission be transferred to another Elsevier journal via the Article Transfer Service, we may securely transfer your reviewer comments and name/contact details to the receiving journal editor for their peer review purposes.

If you are willing to review this manuscript, please click on the link below:

Agree to Review

If you are unable to review, please click on the link below. You will have an opportunity to write a message to the Editor, or to suggest alternative reviewers.

Decline to Review

Alternatively, you may register your response by accessing the Editorial Manager for Marine Pollution Bulletin as a REVIEWER using the login credentials below:

https://www.editorialmanager.com/mpb/
Your username is: RRozirwan-627

If you need to retrieve password details, please go to: click here to create your password and login

If you accept this invitation, I would be very grateful if you would return your review within 14 days of acceptance.

If you have difficulty downloading the PDF the problem may be caused by a pop-up blocker. To disable pop-up blockers on your PC, click on the 'Tools' menu of your internet browser which is located in the upper navigation menu bar.

You may submit your comments online at the above URL. There you will find spaces for confidential comments to the editor, comments for the author and a report form to be completed.

In addition to accessing our subscriber content, you can also use our Open Access content. Read more about Open Access here: http://www.elsevier.com/openaccess

As a reviewer you are entitled to complimentary access to references, abstracts, and full-text articles on ScienceDirect and Scopus for 30 days. Full details on how to claim your access via Reviewer Hub (reviewerhub.elsevier.com) will be provided upon your acceptance of this invitation to review.

Please visit the Elsevier Reviewer Hub (reviewerhub.elsevier.com) to manage all your refereeing activities for this and other Elsevier journals on Editorial Manager.

With kind regards,

Ralf Schwamborn
Associate Editor
Marine Pollution Bulletin

Reviewer Guidelines are now available to help you with your review: http://www.elsevier.com/wps/find/reviewershome.reviewers/reviewersguidelines

ABSTRACT:
Phytoplankton may indicate changes due to their rapid reaction to external influences in water. The objective of this study is to determine the water quality condition in Tunda Island waters using phytoplankton communities. The sample collection included 20 observation stations in Tunda Island waters, Banten province. The analyzed water samples had parameters of depth, temperature, pH, DO, TDS, salinity, nitrates, and phytoplankton communities. The results obtained by several quality water parameters still meet the quality standards except for nitrates. The composition of phytoplankton consists of 3 classes. Eight phytoplankton genera of the Bacillariophyceae class dominated during observation. The phytoplankton biological index describes the phytoplankton diversity index as moderate diversity, phytoplankton evenness is classified as unstable communities, and phytoplankton dominance is at a moderate condition. Of the six water quality parameters tested, pH, DO, TDS, salinity, and nitrate are closely related to phytoplankton abundance.

Please note: Reviews are subject to a confidentiality policy, http://service.elsevier.com/app/answers/detail/a_id/14156/supporthub/publishing/

#REV_MPB#

To ensure this email reaches the intended recipient, please do not delete the above code

---

Rozirwan unsri <rozirwan@unsri.ac.id>

Thank you for agreeing to review

1 pesan

Marine Pollution Bulletin <em@editorialmanager.com> 31 Mei 2024 pukul 09.06
Balas Ke: Marine Pollution Bulletin <support@elsevier.com>
Kepada: Rozirwan Rozirwan <rozirwan@unsri.ac.id>

Ms. Ref. No.: **MPB-D-23-00629**
Title: PHYTOPLANKTON COMMUNITY STRUCTURE IN TUNDA ISLAND WATERS, BANTEN INDONESIA AS A BIOINDICATOR TO MEASURE WATER QUALITY
Marine Pollution Bulletin

Dear Rozirwan Rozirwan,

Thank you for agreeing to review manuscript number **MPB-D-23-00629** for Marine Pollution Bulletin.

You should treat this invitation, the manuscript and your review (as well as other reviewer comments shared with you) as confidential. You must not share your review or information about the review process with anyone without the agreement of the editors and authors involved, irrespective of the publication outcome. If the manuscript is rejected by this journal and the author agrees that the submission be transferred to another Elsevier journal via the Article Transfer Service, we may securely transfer your reviewer comments and name/contact details to the receiving journal editor for their peer review purposes.

If possible, I would appreciate receiving your review by **13 Jun 2024**.

Please submit your review online using the Editorial Manager for Marine Pollution Bulletin (you may also retrieve the PDF from this website):

https://www.editorialmanager.com/mpb/
Your username is: RRozirwan-627

You may access the manuscript by selecting the "Pending Assignments" link on your Main Menu page.

If you have difficulty downloading the PDF the problem may be caused by a pop-up blocker. To disable pop-up blockers on your PC, click on the 'Tools' menu of your internet browser which is located in the upper navigation menu bar.

Please note that as a part of the Your Paper Your Way service, we now differentiate the requirements for new and revised submissions. Authors may submit the manuscript as a single file Word or PDF to be used in the refereeing process, and the manuscript formatting will only reflect the peer review requirements. To find out more, please visit the journal's Guide for Authors: http://www.elsevier.com/journals/marine-pollution-bulletin/0025-326X/guide-for-authors.

To submit your comments, please click on the "Submit Reviewer Recommendation" link. There you will find spaces for confidential comments to the editor, comments for the author and a report form to be completed.

For further information on how to submit your recommendation and comments, see: http://help.elsevier.com/app/answers/detail/p/7923/a_id/133

Marine Pollution Bulletin operates a manuscript transfer service to relevant title[s] in the field. This service gives authors the option, if they are unsuccessful in their original submission, to decide to have their manuscript transferred to another relevant journal without the need to resubmit or reformat.

We recognize that you are the experts in the field and we want to ensure that our editors fully utilize your comments and guidance. As such, your reviewer reports will also be internally transferred along with the manuscript to the editor of the receiving journal. This will also help to eliminate the risk of you receiving the same manuscript twice.

Overall with this service we are aiming to help facilitate and develop fast, effective and truly innovative solutions to improve the overall manuscript submission and peer review process for all individuals concerned.

As a reviewer you are entitled to complimentary access to ScienceDirect and Scopus. This 30-day access can be activated in the [Rewards] section of your profile in Reviewer Hub (reviewerhub.elsevier.com) and you have six months to activate it.

Please visit the Elsevier Reviewer Hub (reviewerhub.elsevier.com) to manage all your refereeing activities for this and other Elsevier journals on Editorial Manager.

Thank you in advance for your cooperation.

With kind regards,

Ralf Schwamborn
Associate Editor
Marine Pollution Bulletin

Reviewer Guidelines are now available to help you with your review: http://www.elsevier.com/wps/find/reviewershome.reviewers/reviewersguidelines

Please note any suggestion that the author includes citations to reviewers' (or their associates') work must be for genuine scientific reasons and not with the intention of increasing reviewers' citation counts or enhancing the visibility of reviewers' work (or that of their associates).

****
For further assistance, please visit our customer support site at http://help.elsevier.com/app/answers/list/p/7923 Here you can search for solutions on a range of topics, find answers to frequently asked questions and learn more about EM via interactive tutorials. You will also find our 24/7 support contact details should you need any further assistance from one of our customer support representatives.

#REV_MPB#

To ensure this email reaches the intended recipient, please do not delete the above code

---

Review_Due.ics
1K

Rozirwan unsri <rozirwan@unsri.ac.id>

Activate your account for the Marine Pollution Bulletin Editorial Manager Site

1 pesan

Marine Pollution Bulletin <em@editorialmanager.com> 31 Mei 2024 pukul 07.49
Balas Ke: Marine Pollution Bulletin <support@elsevier.com>
Kepada: Rozirwan Rozirwan <rozirwan@unsri.ac.id>

Dear Dr. Rozirwan Rozirwan,

I would like to inform you that your name and email address have been added to Editorial Manager, the online submission and peer review tracking system for Marine Pollution Bulletin. This was done for one the following reason(s):

*You have been selected as a potential reviewer for future submissions (a separate review invitation will be sent once you have been selected to review a submission).
*You authored a submission that was transferred to this journal from another journal.
*The journal would like to invite you to contribute to a special issue.
*You have recently been added to the Editorial Board of the journal.

Please click click here to create your password and login to set your password and complete your account activation for this journal. You may complete account activation later, if you get an invitation to review or when you are submitting a review. However, if account activation does not occur within the next three months, your details will be deleted following our retention policy.

With your username RRozirwan-627 and password, you can login to the Editorial Manager site of this journal at https://www.editorialmanager.com/mpb/. When logged in, please update your personal information by clicking your account name and choosing "Update My Information" from the drop-down menu.

Kind regards,

Ralf Schwamborn
Associate Editor
Marine Pollution Bulletin

More information and support
FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/kw/editorial+manager/

For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/. Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email.

#AU_MPB#
To ensure this email reaches the intended recipient, please do not delete the above code.

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Remove my information/details). Please contact the publication office if you have any questions.

Rozirwan unsri <rozirwan@unsri.ac.id>

Editorial Manager login instructions

1 pesan

Marine Pollution Bulletin <em@editorialmanager.com> 5 Juni 2024 pukul 09.58
Balas Ke: Marine Pollution Bulletin <support@elsevier.com>
Kepada: Rozirwan Rozirwan <rozirwan@unsri.ac.id>

Dear Rozirwan,

Here is your username, which you need to access Editorial Manager at https://www.editorialmanager.com/mpb/.

Username: RRozirwan-627

If you do not know your confidential password, you may reset it by clicking this link: click here to create your password and login

Please save this information in a safe place.

You may also change your password and other personal information by logging into the Marine Pollution Bulletin website and clicking on the Update My Information link on the menu.

Best regards,
Marine Pollution Bulletin

More information and support
FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/kw/editorial+manager/

For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/. Here you can search for solutions on a range of topics, find answers to frequently asked questions, and learn more about Editorial Manager via interactive tutorials. You can also talk 24/7 to our customer support team by phone and 24/7 by live chat and email.

#ED_MPB#

To ensure this email reaches the intended recipient, please do not delete the above code

---

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Remove my information/details). Please contact the publication office if you have any questions.

Marine Pollution Bulletin

PHYTOPLANKTON COMMUNITY STRUCTURE IN TUNDA ISLAND WATERS, BANTEN INDONESIA AS A BIOINDICATOR TO MEASURE WATER QUALITY

--Manuscript Draft--

Manuscript Number:	MPB-D-23-00629
Article Type:	Research Paper
Keywords:	bioindicator, phytoplankton, structure community, water quality, Tunda island
Abstract:	Phytoplankton may indicate changes due to their rapid reaction to external influences in water. The objective of this study is to determine the water quality condition in Tunda Island waters using phytoplankton communities. The sample collection included 20 observation stations in Tunda Island waters, Banten province. The analyzed water samples had parameters of depth, temperature, pH, DO, TDS, salinity, nitrates, and phytoplankton communities. The results obtained by several quality water parameters still meet the quality standards except for nitrates. The composition of phytoplankton consists of 3 classes. Eight phytoplankton genera of the Bacillariophyceae class dominated during observation. The phytoplankton biological index describes the phytoplankton diversity index as moderate diversity, phytoplankton evenness is classified as unstable communities, and phytoplankton dominance is at a moderate condition. Of the six water quality parameters tested, pH, DO, TDS, salinity, and nitrate are closely related to phytoplankton abundance.

PHYTOPLANKTON COMMUNITY STRUCTURE IN TUNDA ISLAND WATERS, BANTEN INDONESIA AS A BIOINDICATOR TO MEASURE WATER QUALITY

Yayuk Sugianti[1*], Mujiyanto[1], Amran Ronny Syam[1], and Adriani Sri Nastiti[1]

[1]Research Centre for Conservation of Marine and Inland Water Resources, National Research and Innovation Agency, Indonesia

[*]Corresponding author at: Postal Address: Jln. Raya Bogor Km 46, Cibinong 16911, Bogor, Jawa Barat, Indonesia

Email: yayu003@brin.go.id; dee.sugianti@gmail.com

ABSTRACT

Mining of sea sand in the water area of Tunda Island can ~~result in changes in the quality~~ of the aquatic environment. Phytoplankton may ~~indicate changes~~ due to their ~~rapid reaction~~ to ~~external influences~~ in water. The objective of this study is to determine the water quality condition in Tunda Island waters using phytoplankton communities. The sample collection included 20 observation stations in Tunda Island waters, Banten province. ~~The analyzed water samples had parameters of depth, temperature, pH, DO, TDS, salinity, nitrates, and phytoplankton communities.~~ The results obtained by several quality water parameters still meet the quality standards except for nitrates. The ~~composition of phytoplankton consists of 3~~ classes: Cyanophyceae, Bacillariophyceae, and Dinophyceae. Eight phytoplankton genera of the Bacillariophyceae class dominated during observation: Bacteriastrum, Chaetoceros, Hemiaulus, Lauderia, Nitzschia, Rhizosolenia, Skeletonema, Thalassiosira, and Thalassiotrix. The phytoplankton biological index ~~describes the~~ phytoplankton diversity index as moderate diversity, phytoplankton evenness is classified as unstable communities, and phytoplankton dominance is at a moderate condition. ~~Of t~~he six water quality parameters~~ ~~tested, pH, DO, TDS, salinity, and nitrate are ~~closely related~~ to phytoplankton abundance. Variations within a phytoplankton group can reflect seasonal dynamics and the ~~impact~~ of changes in the aquatic environment.

Keywords: bioindicator, phytoplankton, structure community, water quality, Tunda island

1. Introduction

The coastal area of Serang Regency, Banten province, ~~has a coastline length of 120 km~~. ~~Coastal resources owned by this region include fishery resources,~~ biological resources such as mangroves, coral reefs, and seagrass beds, ~~including other mining materials that have high economic value~~ (Utina et al., 2018). Sea sand is a mining ~~material with economic value and~~ is currently being exploited in ~~considerable quantities~~ in the ~~waters~~. The high potential of sea sand is because this area is at the confluence of the Karimata Strait and the Sunda Strait, which carries sediments from the area around the Strait (Wisha et al., 2015). Tunda Island is one of the islands on the coast of Serang Regency, ~~which is a place~~ for sea sand mining (Prameswara & Suryawan, 2019). However, sea sand mining activities cause environmental damage in the Tunda island water area (Wahyudi et al., 2018). ~~In addition~~, Tunda Island waters are a ~~water area busy with sea transportation~~, ~~so many large ships go back and forth from Java to Sumatra or vice versa. It is also a well-known sport fishing area at the national level~~ (Sasongko et al., 2020).

Some negative ~~impacts~~ of sea sand mining ~~are increasing~~ coastal abrasion and erosion, ~~reducing the quality of the marine and coastal aquatic environment~~, and ~~increasing pollution on~~ the beach. ~~This condition that occurs every day can cause the ecosystem to be unable to recover and cause negative impacts.~~ ~~Research by~~ Ernas et al. (2018) ~~shows~~ that sea sand mining ~~has increased~~ Total Suspended Solid (TSS) ~~to exceed the threshold of environmental quality standards~~ in Banten Bay waters, Serang regency (Tanuri, 2020).

Phytoplankton is aquatic organisms floating on the water's surface and of microscopic size. Phytoplankton can ~~respond~~ to environmental changes, assess ecological changes, and ~~reflect important~~ systemic interactions (Wu et al., 2019). Phytoplankton can ~~indicate~~ water change and productivity (Hutabarat et al., 2014; Yu et al., 2022). ~~This organism is an object for assessing water quality through biomonitoring due to its rapid reaction to external influences~~ (Bazhenova & Krentz, 2018). In general, it can ~~be used~~ as a bioindicator of water quality. ~~The picture of water quality and pollution conditions can be seen from the high and low values of the phytoplankton community structure.~~

~~This study aims to determine the water quality condition in Tunda Island waters using phytoplankton communities.~~

2. Materials and Methods

Research sampling was conducted at 20 (twenty) points around Tunda Island, Serang Regency, Banten Province (Figure 1).

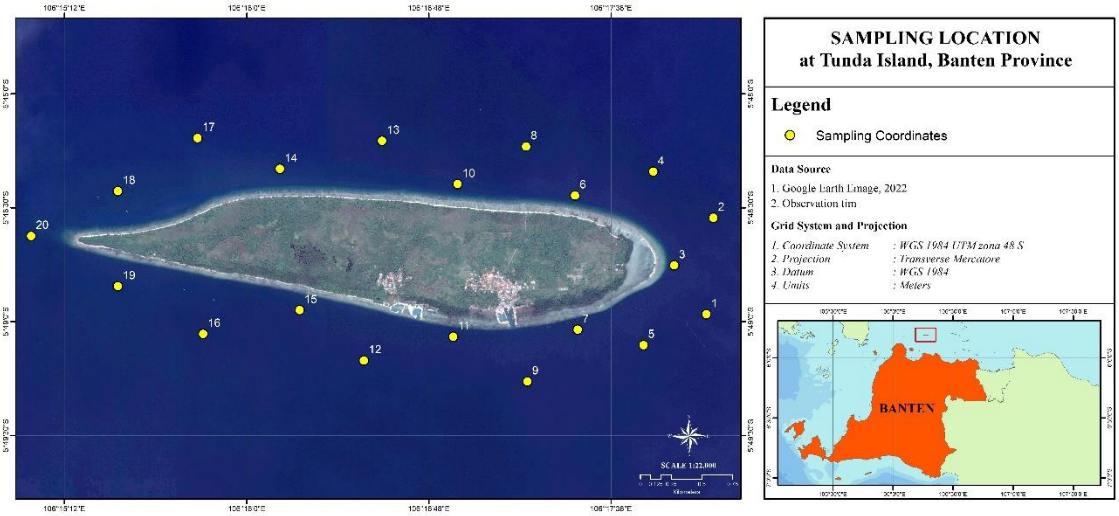


Figure 1. Research location on Tunda Island, Banten Province

Data were collected in July and November 2020 on Tunda Island waters. The study used the purposive sampling method, determining a sample based on the station chosen as the survey subject (Yusal et al., 2019). In addition to phytoplankton sampling, six water quality parameters were also measured, namely temperature (°C), pH, DO (mg/L), TDS (gr/L), salinity (ppt), and nitrate (mg/L). Furthermore, phytoplankton samples taken using plankton net No. 25 were preserved using a 4% lugol solution and identified at the Plankton Laboratory, Research institute for fisheries enhancement, Jatiluhur. Every 1 ml of concentrate was observed under a microscope with a magnification of 10 x and was calculated using Sedgwick Rafter Counting (Moncheva & Parr, 2010).

Phytoplankton abundance is calculated using the calculation of the Stirling formula (Baird et al., 2017; Effendi et al., 2016):

$$N = n\ x\ \frac{p1}{p2}\ x\ \frac{v1}{v2}\ x\ \frac{1}{W}$$

N : phytoplankton abundance (cell/l)

n : number of observed phytoplankton

p1 : total area/container area of sedgwick rafter counting cell (mm^2)

p2 : observation area (mm^2)

V1 : volume of filtered water (ml)

V2 : concentrate volume of Sedgwick rafter counting cell (ml)

W : volume of filtered water sample (l)

The structure of phytoplankton communities was analyzed using diversity, evenness, and dominance index based on (Odum & Barret, 1971) with the following formula:

$$H' = \sum_{t=i}^{s} Pi \ln Pi$$

H' : diversity index of Shannon Wiener

Pi : ni/N

Ni : total number of species *i*

N : phytoplankton abundance

s : number of species

$$E = \frac{H}{H'maks}$$

E : evenness index

H' maks : Ln s (s is number of species)

H : diversity index

$$C = \sum_{i=1}^{s} (\frac{ni}{N})2$$

C : dominance index of Simpson

N : general quantity of species

Bioindicators of phytoplankton were assessed under the following conditions (Morris et al., 2014):

- Diversity: H'≤ 2 low; 2 < H'≤ 3 moderate; H' > 3 high;

- Dominance: $0 < C \leq 0.5$ low; $0.5 < C \leq 0.75$ moderate; $0.75 < C \leq 1$ high;
- Evenness Index: $0 < E \leq 0.5$ under pressure; $0.5 < E \leq 0.75$ unstable; $0.75 < E \leq 1$ stable.

The relationship between water quality and the structure community of phytoplankton was analyzed using Minitab version 16.

3. Results and Discussion

3.1. Water Quality Parameters

The results of measuring several water quality parameters that affect phytoplankton growth (temperature, pH, DO, TDS, salinity and nitrates) in Tunda island waters are presented in Table 1.

Table 1. Water quality parameters during observations on Tunda island

Parameter	**Depth (cm)**	**Water Temperature (°C)**	**pH**	**DO (mg/L)**	**TDS (gr/L)**	**Salinity (ppt)**	**Nitrate (mg/L)**
Quality standards		28-30*)	7,0-8,5*)	>5*)	80*)	30-35*)	0.002-0.008*)
Mean	67.50	29.53	7.92	6.45	24.47	32.78	0.06
SD	8.66	0.16	0.72	0.85	0.24	0.26	0.00

*Description: *) Decree of the Minister of the Environment No. 51 of 2004 concerning marine quality standards*

At the time of observation, it was in the typical range for tropical Indonesia, where the optimum temperature for phytoplankton growth ranged from 25-30 °C (Febriansyah et al., 2022). The pH value obtained with an average of 7.92 is in good condition to support aquatic survival. Likewise, the DO, TDS and salinity parameters are still under marine quality standards. The standard refers to the annexe to the Decree of the Minister of Environment No. 51 of 2004 concerning seawater quality standards for the survival of marine life.

While the average value of nitrate during observation is 0.06 mg / L, higher than the set quality standard of 0.002-0.008 mg / L. Nitrate itself is very necessary for the growth of phytoplankton and aquatic plants (Astuti et al., 2022). However, if the content isn't too much, it will stimulate the growth of phytoplankton and cause an uncontrolled explosion of phytoplankton (Ikhsan et al., 2020; Takarina et al., 2019). This condition can result in the death of other aquatic organisms in the environment.

3.2.Phytoplankton Composition

Phytoplankton has been identified in three classes. In general, phytoplankton in Tunda island is dominated by Bacillariophyceae (85%) and Dinophyceae (12%). Meanwhile, the least found at the study site is Cyanophyceae (3%) (Figure 2).

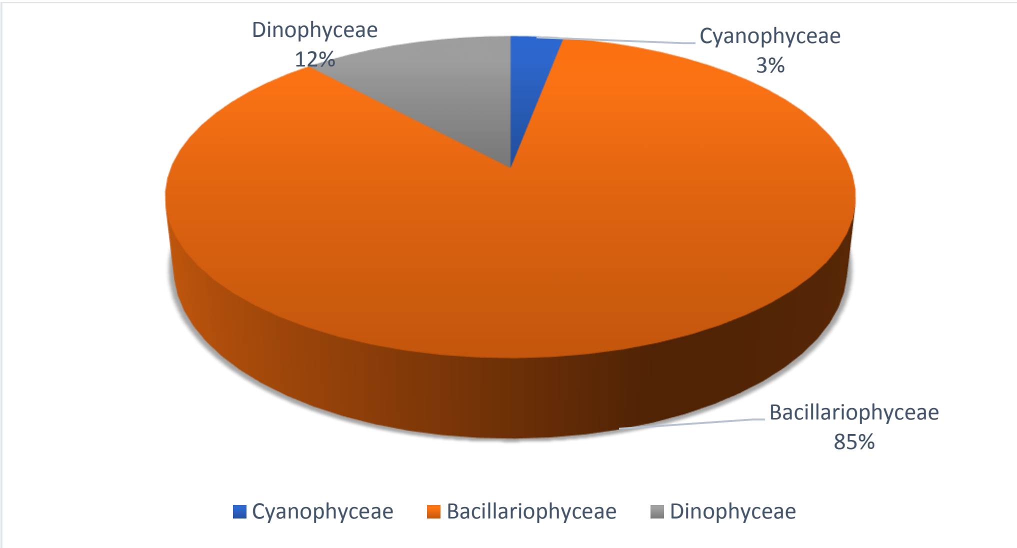


Figure 2. The composition of the phytoplankton class during observations on Tunda Island

Based on the study's results, 34 genera from 3 classes were found, Cyanophyceae 1 genus, Bacillariophyceae 29 genus, and Dinophyceae 4 genus (Table 2).

Table 2. Types of phytoplankton found in Tunda Island waters

Class	**Phytoplankton genus**	**%**
Cyanophyceae	*Trichodesmium*	0.001
Bacillariophyceae	*Asterionella*	0.013
	Amphiprora	0.000
	Bacillaria	0.002
	Bacteriastrum	0.057
	Biddulphia	0.001
	Cerataulina	0.006
	Chaetoceros	0.192

Class	Phytoplankton genus	%
	Climacodium	0.001
	Coscinodiscus	0.004
	Cyclotella	0.000
	Cylindrotheca	0.000
	Diatoma	0.000
	Dytilum	0.003
	Eucampia	0.010
	Guinardia	0.003
	Hemiaulus	0.089
	Lauderia	0.008
	Leptocylindrus	0.002
	Melosira	0.001
	Navicula	0.000
	Nitzchia	0.187
	Planktonella	0.000
	Pleurosigma	0.002
	Rhizosolenia	0.078
	Skeletonema	0.157
	Strepthoteca	0.007
	Thalassionema	0.004
	Thalassiosira	0.107
	Thalassiothrix	0.058
Dinophyceae	*Ceratium*	0.004
	Dinophysis	0.000
	Protoperidinium	0.001
	Prorocentrum	0.000

Overall, ~~the composition of phytoplankton on~~ Tunda Island waters is ~~almost the same as the composition on~~ the coast of South Sulawesi. ~~As is known, the most diverse organism in phytoplankton communities in tropical coastal systems is~~ the Bacillariophyceae class ~~.~~(Conceição et al., 2021). ~~The results of~~ Lestari et al. (2021) ~~showed~~ that the Bacillariophyceae class was the ~~dominating~~ phytoplankton ~~class~~, followed by the Dinophyceae and Cyanophyceae classes. These three classes of phytoplankton become ~~the main groups that~~ may ~~be empowered by~~ inorganic nitrogen contamination (El Gammal et al., 2017). ~~Phytoplankton from the Bacillariophyceae class~~ can adapt to their aquatic ~~environment, has good~~ tolerance, and ~~has a high resistance~~ to environmental changes (Takarina et al., 2019). ~~In addition~~, phytoplankton of this class ~~has the characteristic of forming chains and colonies~~ (Otero et al., 2020)

3.3.Phytoplankton Community Structure

~~Phytoplankton of the Bacillariophyceae class is generally~~ the most common producers in trophic waters (Hasan et al., 2022). ~~The highest phytoplankton abundance during the observation was found in station 4~~ (73150 cells/l), with ~~the predominantly~~ community ~~being a genus of phytoplankton from the Bacillariophyceae class~~.

Table 3. Phytoplankton abundance during observations on Tunda Island

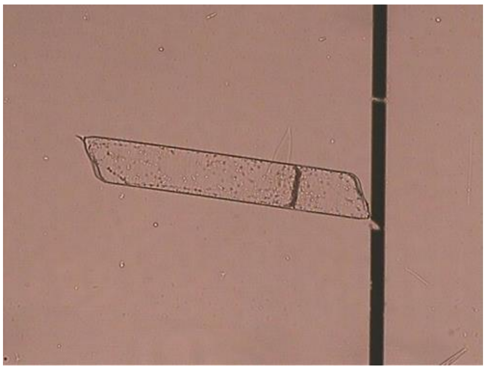
Station	**Phytoplankton abundance (cells/litre)**					
	Cyanophyceae		**Bacillariophyceae**		**Dinophyceae**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
1	80	113.1	15100	10323.8	200	141.4
2	100	141.4	15050	5161.9	150	70.7
3	150	212.1	16900	7778.2	100	141.4
4	150	212.1	73150	31749.1	500	282.8
5	50	70.7	63650	71205.7	200	141.4
6	80	113.1	64500	19516.1	250	70.7
7	100	141.4	34650	40234.4	50	70.7
8	100	141.4	32000	26445.8	100	141.4
9	150	212.1	13650	6858.9	150	70.7
10	0	0.0	20800	20647.5	100	0.0
11	0	0.0	12350	8697.4	150	70.7
12	0	0.0	26950	11950.1	100	0.0
13	0	0.0	26300	12869.3	50	70.7
14	60	84.9	24550	10394.5	150	70.7
15	50	70.7	45400	19091.9	300	141.4
16	0	0.0	35100	40870.8	250	212.1
17	60	84.9	58950	57204.9	150	70.7
18	300	0.0	31850	5020.5	100	0.0

19	0	0.0	47750	48719.7	450	212.1
20	0	0.0	15750	9828.8	100	141.4

The genus of such phytoplankton ~~belongs to the~~ Bacillariophycea ~~class~~. Eight of the 34 ~~genus identified were found at each station~~: Bacteriastrum, Chaetoceros, Hemiaulus, Lauderia, Nitzschia, Rhizosolenia, Skeletonema, Thalassiosira, and Thalassiotrix. ~~Of the eight genus, 6 of them had the highest abundance during observation~~ (Figure 3). These ~~results~~ are ~~in line~~ with the ~~research~~ of Rozirwan et al.(2022), ~~which found several genus~~ phytoplankton ~~such as~~ Bacteriastrum, Chaetoceros, Rhizosolenia, and Thalassiosira are also found in ~~almost~~ all observation stations of Muara Banyuasin.

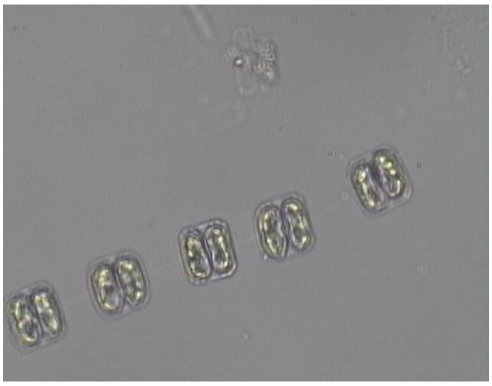
Chaetoceros

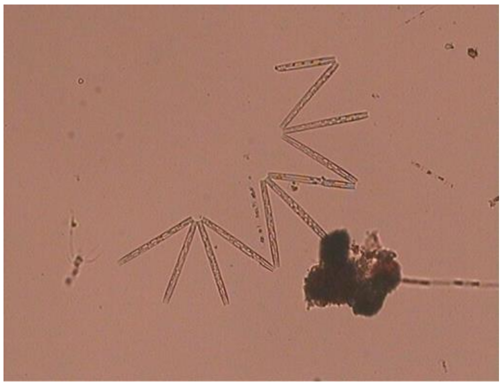
Nitzschia



Rhizoselenia

Skeletonema





Thalassiosira *Thalassiotrix*

Figure 3. The highest phytoplankton abundance genus is found in Tunda island waters

~~Based on the calculation of t~~the Shannon-Wiener diversity index (H'), ~~the value of H' in~~ Tunda Island waters ~~indicates a~~ range ~~of~~ 1.78-2.36, ~~categorized as~~ moderate diversity. The phytoplankton evenness index (E) ~~is classified as a community in an unstable condition, while~~ the phytoplankton dominance index (C) is in a moderate condition (Figure 4). ~~The diversity of a species depends on critical~~ ecological processes ~~such as competition, predation, and succession~~. ~~Therefore, changes~~ in this process can ~~change~~ the species diversity index ~~through a shift in~~ its evenness (Effendi et al., 2016).

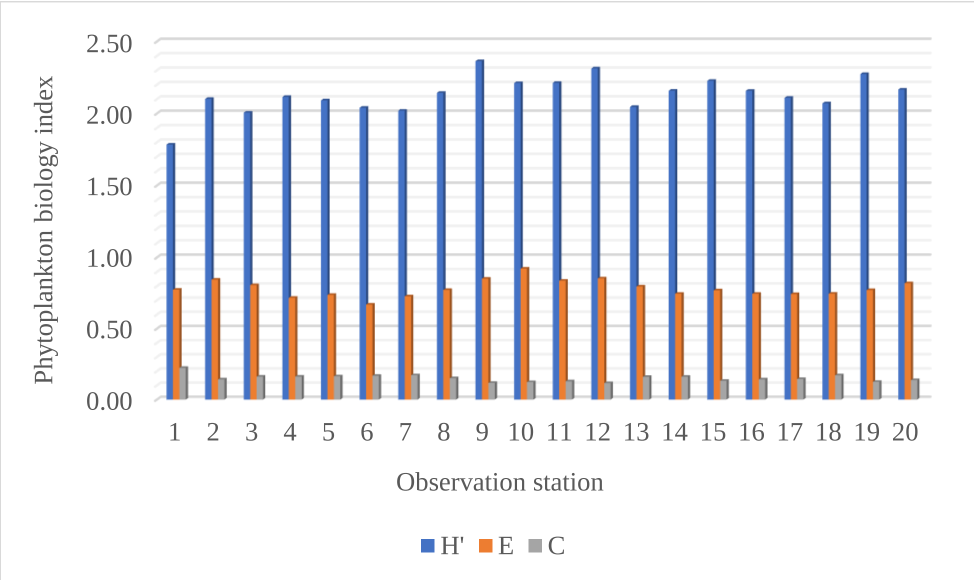


Figure 4. Phytoplankton biological index ~~during observations~~ on Tunda Island

3.4.The relationship of phytoplankton abundance with water quality parameters

Statistical tests ~~show~~ that phytoplankton abundance ~~has a positive relationship~~ with pH, DO, TDS, salinity, and nitrates. These five water quality ~~parameters strongly~~ influence ~~the~~ phytoplankton abundance at the 12 observation stations (Figure 5).

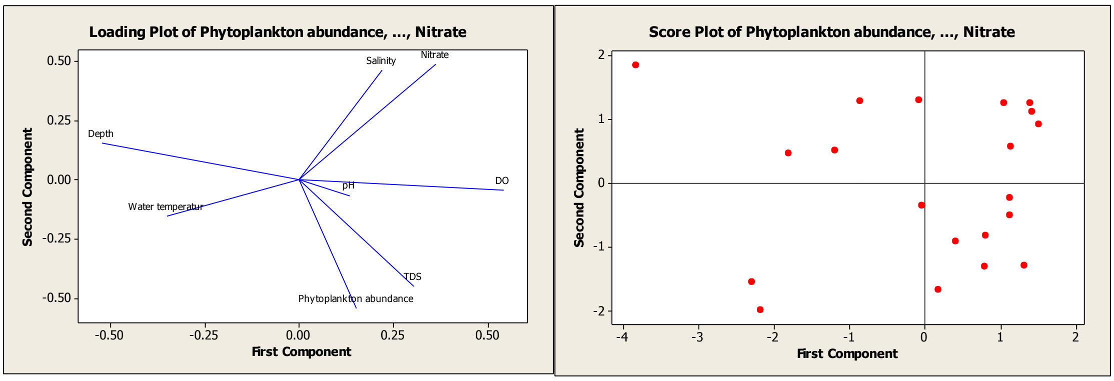


Figure 5. The relationship of phytoplankton abundance with water quality parameters at the Tunda Island observation station

The parameters ~~of~~ pH, DO, TDS, salinity, and nitrate play an ~~essential~~ role ~~as limiting factors on~~ phytoplankton abundance. ~~In line with research~~ (El Gammal et al., 2017), salinity, DO, and nitrogen ~~is limited~~ factors for phytoplankton diversity in the Arabian Gulf, Saudi Arabia. Variations in phytoplankton groups reflect ~~the seasonal dynamics of the impact~~ of changes occurring in the aquatic environment. The production of phytoplankton ~~demonstrates the supply~~ of resources into the ecosystem. In addition, phytoplankton of the Bacillriophyceae class showed moderate to high levels of nutrients. ~~On Tunda island, many activities such as~~ ports, tours, sea sand mining, settlements, and fishing result in anthropogenic ~~discharges~~ into the water. The nutrient increase ~~of~~ anthropogenic ~~release stimulates the growth of~~ phytoplankton through photosynthesis.

4. Conclusion

Phytoplankton communities can ~~be used as an indicator~~ of water quality. ~~On~~ Tunda island, phytoplankton communities ~~fall into~~ unstable communities, ~~indicated~~ by the presence of phytoplankton dominance of the ~~class~~ Bacillriophyceae. Bacillariophyceae is the most diverse and highly abundant class ~~because it has a variety of~~ environmental ~~variables.~~ The diversity and abundance of phytoplankton communities reflect the ~~supply~~ of resources ~~into~~ the ecosystem. Variations in a ~~single~~ phytoplankton group ~~can skip the seasonal dynamics of the~~ impact of changes occurring in the aquatic environment.

Acknowledgement

This observation is part of the research titled “Research on reef rehabilitation in Banten Coast” in the Research Institute for Fisheries Resources Enhancement (RIFRE). The study was funded by the National Budget (APBN) of RIFRE, the Ministry of Marine Affairs and Fisheries, in 2020 years.

Author Contributions

Yayuk Sugianti: Draft writing, Data analysis, finalization. Mujiyanto: Draft writing, methodology, data visualization. Amran Ronny Syam: Writing review, software. Adriani Sri Nastiti: Writing review, supervision,

Reference

Astuti, L. P., Sugianti, Y., Warsa, A., & Sentos, A. A. (2022). Water Quality and Eutrophication in Jatiluhur Reservoir, West Java, Indonesia. *Polish Journal of Environmental Studies*, *31*(2), 1493–1503. https://doi.org/10.15244/pjoes/142475

Baird, R. ., Eaton, A. ., & Rice, E. . (2017). *Standard methods for the examination of water and wastewater*. WEF) Water Environment Federation (APHA) American Public Health Association.

Bazhenova, O. P., & Krentz, O. O. (2018). Phytoplankton as an Indicator of Ecological State of the Saltaim-Tenis Lake System (Omsk Region). *Contemporary Problems of Ecology*, *11*(2), 168–178. https://doi.org/10.1134/S1995425518020026

Conceição, L. P., de Jesus Affe, H. M., da Silva, D. M. L., & de Castro Nunes, J. M. (2021). Spatio-temporal variation of the phytoplankton community in a tropical estuarine gradient, under the influence of river damming. *Regional Studies in Marine Science*, *43*, 101642. https://doi.org/10.1016/j.rsma.2021.101642

Effendi, H., Kawaroe, M., Lestari, D. F., Mursalin, & Permadi, T. (2016). Distribution of Phytoplankton Diversity and Abundance in Mahakam Delta, East Kalimantan. *Procedia Environmental Sciences*, *33*, 496–504. https://doi.org/10.1016/j.proenv.2016.03.102

El Gammal, M. A. M., Nageeb, M., & Al-Sabeb, S. (2017). Phytoplankton abundance in relation to the quality of the coastal water – Arabian Gulf, Saudi Arabia. *Egyptian Journal of Aquatic Research*, *43*(4), 275–282.

https://doi.org/10.1016/j.ejar.2017.10.004

Ernas, Z., Thayib, M. H., & Pranowo, W. S. (2018). Pengaruh Penambangan Pasir Laut Terhadap Kekeruhan Perairan Teluk Banten Serang. *Jurnal Segara*, *14*(1), 35–42. https://doi.org/10.15578/segara.v14i1.7149

Febriansyah, S. ., Hakim, L., & Retnaningdyah, C. (2022). Evaluation of Mangrove Water Quality in Pancer Cengkrong, Trenggalek and Sine, Tulungagung, East Java, Indonesia Using Phytoplankton as Bio- indicators. *Jurnal Ilmiah Perikanan Dan Kelautan*, *14*(2), 297–312. https://doi.org/10.20473/jipk.v14i2.32459

Hutabarat, P. U. ., Redjeki, S., & Hartati, R. (2014). Komposisi Dan Kelimpahan Plankton Di Perairan Kayome Kepulauan Togean Sulawesi Tengah. *Diponegoro Journal of Marine Research*, *3*(4), 447–455.

Ikhsan, M. K., Rudiyanti, S., & Ain, C. (2020). Hubungan antara Nitrat dan Fosfat dengan Kelimpahan Fitoplankton di Waduk Jatibarang Semarang. *Journal Of Maquares*, *9*(1), 2020.

Lestari, H. A., Samawi, M. F., Faizal, A., Moore, A. M., & Jompa, J. (2021). Diversity and abundance of phytoplankton in the coastal waters of South Sulawesi. *HAYATI Journal of Biosciences*, *28*(3), 199–211. https://doi.org/10.4308/hjb.28.3.199

Moncheva, S., & Parr, B. (2010). *Manual for Phytoplankton Sampling and Analysis in the Black Sea*. GEF/UNDP Black Sea Ecosystem Recovery Project.

Morris, E. K., Caruso, T., Buscot, F., Fischer, M., Hancock, C., Maier, T. S., Meiners, T., Müller, C., Obermaier, E., Prati, D., Socher, S. A., Sonnemann, I., Wäschke, N., Wubet, T., Wurst, S., & Rillig, M. C. (2014). Choosing and using diversity indices: Insights for ecological applications from the German Biodiversity Exploratories. *Ecology and Evolution*, *4*(18), 3514–3524. https://doi.org/10.1002/ece3.1155

Odum, E. ., & Barret, G. . (1971). *Fundamentals of ecology*. Philadelphia: Saunders.

Otero, J., Álvarez-Salgado, X. A., & Bode, A. (2020). Phytoplankton Diversity Effect on Ecosystem Functioning in a Coastal Upwelling System. *Frontiers in Marine Science*, *7*(November), 1–15. https://doi.org/10.3389/fmars.2020.592255

Prameswara, B., & Suryawan, I. B. (2019). Strategi Pengembangan Potensi Wisata Bahari Pulau Tunda, Kecamatan Tirtayasa, Kabupaten Serang, Provinsi Banten. *Jurnal Destinasi Pariwisata*, *7*(1), 180. https://doi.org/10.24843/jdepar.2019.v07.i01.p27

Rozirwan, Fauziyah, Wulandari, P. I., Nugroho, R. Y., Agutriani, F., Agussalim, A., Supriyadi, F., & Iskandar, I. (2022). Assessment distribution of the phytoplankton community structure at the fishing ground, Banyuasin estuary, Indonesia. *Acta Ecologica Sinica*, *42*(6), 670–678. https://doi.org/10.1016/j.chnaes.2022.02.006

Sasongko, A. S., Cahyadi, F. D., Yonanto, L., Islam, R. S., & Destiyanti, N. F. (2020). Kandungan logam berat di perairan pulau tunda kabupaten serang provinsi banten. *Manfish Journal*, *1*(September), 90–95.

Takarina, N. D., Nurliansyah, W., & Wardhana, W. (2019). Relationship between environmental parameters and the Plankton community of the Batuhideung fishing grounds, Pandeglang, Banten, indonesia. *Biodiversitas*, *20*(1), 171–180. https://doi.org/10.13057/biodiv/d200120

Tanuri, C. (2020). Penambangan Pasir Laut yang Menimbulkan Kerusakan Lingkungan Di Tinjau Dari Undang-Undang Nomor 27 Tahun 2007. *Jurnal Education and Development*, *8*(3), 7–13.

Utina, R., Nusantari, E., Katili, A. S., & Tamu, Y. (2018). Ekosistem dan Sumber Daya Alam Pesisir. In *Journal of Chemical Information and Modeling* (Vol. 53, Issue 9).

Wahyudi, W., Riani, E., & Anwar, S. (2018). Strategi Pengelolaan Penambangan Pasir Laut Yang Berkelanjutan (Studi Kasus Pulau Tunda, Provinsi Banten). *Jurnal Ilmu Dan Teknologi Kelautan Tropis*, *10*(2), 277–289. https://doi.org/10.29244/jitkt.v10i2.19066

Wisha, U. J., Husrin, S., & Prihantono, J. (2015). Hydrodynamics Banten Bay During Transitional Seasons (August-September) (Hidrodinamika Perairan Teluk Banten Pada Musim Peralihan (Agustus–September)). *ILMU KELAUTAN: Indonesian Journal of Marine Sciences*, *20*(2), 101. https://doi.org/10.14710/ik.ijms.20.2.101-112

Wu, Z., Kong, M., Cai, Y., Wang, X., & Li, K. (2019). Index of biotic integrity based on phytoplankton and water quality index: Do they have a similar pattern on water quality assessment? A study of rivers in Lake Taihu Basin, China. *Science of the Total Environment*, *658*, 395–404. https://doi.org/10.1016/j.scitotenv.2018.12.216

Yu, H., Shi, X., Zhao, S., Sun, B., Liu, Y., Arvola, L., Li, G., Wang, Y., Pan, X., Wu, R., & Tian, Z. (2022). Primary productivity of phytoplankton and its influencing factors in cold and arid regions: A case study of Wuliangsuhai Lake, China. *Ecological Indicators*, *144*(October), 109545. https://doi.org/10.1016/j.ecolind.2022.109545

Yusal, M. S., Marfai, M. A., Hadisusanto, S., & Khakhim, N. (2019). Abundance of Meiofauna and Physical-Chemical Parameters as Water Quality Indicator. *ILMU KELAUTAN: Indonesian Journal of Marine Sciences*, *24*(2), 81. https://doi.org/10.14710/ik.ijms.24.2.81-90

Declaration of interests

☐The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☒The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Yayuk Sugianti reports administrative support was provided by National Research and Innovation Agency Republic of Indonesia. None reports a relationship with None that includes:. None has patent -pending to -. This manuscript has not been published and is not under consideration for publication elsewhere. All authors have read and approved the manuscript and take full responsibility for its content. All authors do not have a conflict of interest in regard to this research or its funding.

Rozirwan unsri <rozirwan@unsri.ac.id>

Thank you for the review of MPB-D-23-00629

1 pesan

Marine Pollution Bulletin <em@editorialmanager.com> 6 Juni 2024 pukul 10.31
Balas Ke: Marine Pollution Bulletin <support@elsevier.com>
Kepada: Rozirwan Rozirwan <rozirwan@unsri.ac.id>

Ms. Ref. No.: **MPB-D-23-00629**
Title: PHYTOPLANKTON COMMUNITY STRUCTURE IN TUNDA ISLAND WATERS, BANTEN INDONESIA AS A BIOINDICATOR TO MEASURE WATER QUALITY
Marine Pollution Bulletin

Dear Rozirwan Rozirwan,

Thank you for your review of this manuscript.

You may access your review comments and the decision letter (when available) by logging onto the Editorial Manager at https://www.editorialmanager.com/mpb/. Please login as a Reviewer.

As a token of appreciation, we would like to provide you with a review recognition certificate on Elsevier Reviewer Hub (reviewerhub.elsevier.com). Through the Elsevier Reviewer Hub, you can also keep track of all your reviewing activities for this and other Elsevier journals on Editorial Manager.

If you have not yet activated your 30 day complimentary access to ScienceDirect and Scopus, you can still do so via the [Rewards] section of your profile in Reviewer Hub (reviewerhub.elsevier.com).
You can always claim your 30-day access period later, however, please be aware that the access link will expire six months after you have accepted to review.

Kind regards,

Ralf Schwamborn
Associate Editor
Marine Pollution Bulletin

****
For any technical queries about using EM, please contact Elsevier Reviewer Support at reviewersupport@elsevier.com

#REV_MPB#

To ensure this email reaches the intended recipient, please do not delete the above code

---

ELSEVIER

Marine Pollution Bulletin

Certificate of Reviewing

Awarded for 1 review in June 2024
presented to

ROZIRWAN ROZIRWAN

in recognition of the review contributed to the journal

The Editors of Marine Pollution Bulletin

Elsevier Reviewer Recognition