p-ISSN. 2406-9825
e-ISSN. 2614-3178

Acta Aquatica: Aquatic Sciences Journal, 11:1 (April, 2024): 43-48

Acta Aquatica
Aquatic Sciences Journal

Struktur komunitas bivalvia di pesisir Desa Lungkap, Pinolosian, Kecamatan Bolaang Mongondow Selatan

Community structures of bivalves in the coastal area of Lungkap Village, Pinolosian, Bolaang Mongondow Selatan District

Received: 14 November 2023, Revised: 29 November 2023, Accepted: 24 January 2024
DOI: 1 0.29103/aa.v11i1.13424

Yenita Damopolii[a], Miftahul Khair Kadim[b]*, and Arfiani Rizki Paramata[b]

[a] *Bachelor Program Faculty of Fisheries and Marine Sciences, Universitas Negeri Gorontalo*
[b] *Department of Aquatic Resources Management, Faculty of Fisheries and Marine Science, Universitas Negeri Gorontalo*

Abstrak

Penelitian ini bertujuan untuk mengidentifikasi struktur komunitas bivalvia di pesisir Desa Lungkap, Pinolosian, Kecamatan Bolaang Mongondow Selatan. Pengambilan sampel dilakukan pada bulan Desember 2020 hingga Januari 2021 pada tiga stasiun yaitu padang lamun (Stasiun I), objek wisata (Stasiun II), dan mangrove (Stasiun III), dengan menggunakan metode transek kuadran. Setiap stasiun pengamatan dibuat transek garis dari daratan ke arah laut dimana jarak antar transek garis adalah 50 m. Hasil pengamatan menunjukkan bahwa Bivalvia di lokasi penelitian terdiri dari lima famili (Arcidae, Asteridae, Cyprinidae, Cardiidae, Ostreidae) dan 6 Spesies bivalvia dimana indeks keanekaragamannya rendah dan indeks keseragaman yang sedang menunjukkan penyebaran masing-masing jenis relatif merata.

Kata kunci: *Bivalvia*; *Lungkap; pesisir; struktur komunitas*

Abstract

This research aims to identify the structure of the bivalve community on the coast of Langkat Village, Pinolosian, South Bolaang Mongondow District. Sampling was carried out from December 2020 to January 2021 at three stations, namely seagrass beds (Station I), tourist attractions (Station II), and mangroves (Station III), using the quadrant transect method. A line transect was made at each observation station from land to sea, where the distance between line transects was 50 m. Observation results show that Bivalves at the research location consist of five families (Arcidae, Asteridae, Cyprinidae, Cardiidae, Ostreidae) and six species of bivalves where the diversity index is low, and the uniformity index is moderate, indicating that the distribution of each type is relatively even.

Keywords: Bivalve; coastal; community structure; Lungkap

1. Introduction

1.1. Research background

The coast is a meeting between land and seam, including land areas, including dry and submerged areas still affected by marine features such as tides, sea breezes, and saltwater leaks. Seaward, coastal regions include parts of the ocean that are still affected by natural processes (such as sedimentation and freshwater flow) and human activities on land (such as pollution or deforestation) (Djunaidi et al., 2014). The coastal area acts as a buffer, protector, and filter between land and sea. Coastal areas are natural ecosystems that are fertile, unique, and have high ecological and economic value (Mohamad et al., 2020).

Bivalves are a crucial part of the food chain and play a vital role in supporting the lives of other animals at a higher trophic level (Ayunda, 2011). In addition to their ecological importance, they are also highly diverse, and some species are used as a food source by coastal communities, making them economically valuable. However, it is important to note that Bivalves can accumulate heavy metals in their tissues, posing risks to human health. Despite this concern, their ability to accumulate heavy metals makes them useful as bioindicators of aquatic environments in coastal areas (Wahyuni et al., 2017; Kadim & Arfiati, 2022).

Bivalvia is a source of food, such as *Anadara granosa*, *Anadara pilula*, *Mytilus viridis*, *Crassostrea cucullata*, etc

* *Korespondensi: Prodi Manajemen Sumber Daya Periairan, Fakultas Perikanan dan Ilnu Kelautan, Universitas Negeri Gorontalo. Kota Gorontalo, Gorontalo, 96128, Indonesia.*
Telp: +62-8114314871
e-mail: miftahulkhairkadim@ung.ac.id

(Fauzani, 2017). This species usually lives on the bottom of muddy or sandy waters (Setiawan et al., 2021). The body and legs of a bivalve are usually flattened horizontally, and the rest is covered with a mantle and two rear-connected shells. Some shells are not sessile; they are firmly attached to solid bodies by byssus threads (Dhalia et al., 2017).

This research was conducted based on the critical role and function of Bivalves in coastal areas and the lack of information regarding the presence of Bivalves in the coastal areas of Lungkap Village. The research highlights the structure of Bivalvia communities in seagrass, mangrove ecosystems, and tourist attractions in the coastal area of Langkap Village, Bolaang Mongondow Selatan District, to provide the information needed for the management of coastal ecosystems in this area in particular and the surrounding waters in general.

1.2. Problems identification

Lungkap village is one of the villages in the coastal area of South Bolaang Mongondow Regency, North Sulawesi Province. Local people use Bivalvia as a livelihood to be sold or used as food ingredients. Although the work of collecting shells is still done traditionally, if it continues, it is feared that the population will decrease. So far, there is no information regarding the bivalve community structure in the coastal area of Bolaang Mongondow Selatan, especially in the coastal area of Luntung Village, Pinolosian District.

1.3. Research objectives

This research aims to identify the structure of the bivalve community on the coast of Langkat Village, Pinolosian, Bolaang Mongondow Selatan District. So, the results of this study are expected to provide information to the public about the structure of the bivalve community and can be used as one of the considerations for determining different management policies to protect the sustainability of stocks from the bivalve community itself.

2. Materials and Methods

2.1. Time and location

This research was conducted from December 2020 to January 2021 in the coastal area of Lungkap Village, Pinolosian, Bolaang Mongondow Selatan District. The research location is presented in Figure 1.

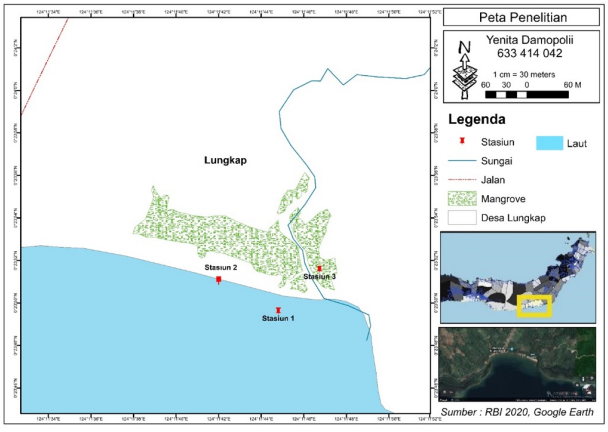

Figure 1. Sampling locations.

Sampling was conducted at three observation stations determined purposively based on human activity, ecological conditions, or land use (Table 1).

Table 1
Observation station description.

Stations	Description	coordinate
I	Seagrass area	0°39'65.03"LU, 124°18.98'05"BT
II	Tourist area	0°39'73.86"LU, 124°19.49'03"BT
II	River estuary near the mangrove forest	0°39'73.27"LU, 124°19.61'82"BT

2.2. Materials and tools

The tools and materials used in collecting research data are roll meters, GPS, stationery, cameras, identification books, and raffia ropes.

2.3. Research methods

The research was conducted using a survey method at several selected stations (purposive sampling). According to Arikunto (2006), the researcher carried out the purposive sampling technique with specific considerations regarding sample data collection. For this research, several considerations include limited time, energy, difficulties in the field, and available instruments. The research object, Bivalves, was collected using the line transect method at three observation stations.

2.4. Research procedure

Data collection for Bivalvia in the waters of the Luntung Village beach was carried out using the quadrant transect method (Hutagalung et al., 1997). A line transect was made from land to sea. Each station is further divided into three sub-stations. Line transects were installed at each sub-station with a distance between line transects of 50 meters. Then set up a 1x1 m^2 plot (transect) along the transect line of 5 plots, 10 meters between 1 plot and another plot. The Bivalvia sample was then stored in a plastic container, preserved using 70% alcohol, and labelled. The samples were then taken to the Hydrobiotechnology and Biometrics Laboratory, Faculty of Fisheries and Marine Sciences, Universitas Negeri Gorontalo for identification. In addition, water quality parameters were measured, namely temperature, pH, salinity and type of substrate.

Bivalve samples were identified by morphoristic method. The morphoristic method looks at the overall morphological system (outer forms such as color, shell shape, and size of the bivalves) (Febrina, 2018). Identification refers to identification guides (such as Dhalia et al., 2017; Dharma, 2005; Lutaenko & Noseworthy, 2019; Oliver et al., 2004; Zvonareva et al., 2019) or WoRMS (marinespecies.org). To determine the texture of the substrate at each station, visual observations were carried out using the technique of feeling the texture of the substrate following the procedure by Husuna et al. (2019).

2.6. Data analysis

The sample data that has been collected is then analyzed on the community structure and distribution patterns of Bivalves using several biological index formulas, as follows:

2.6.1. Abundance

The abundance of bivalves is calculated using the formula (Talib, 2008):

$$D_i = \frac{N_i}{A}$$

where,
D_i = Abundance of bivalves (ind/m^2),
N_i = Number of individuals bivalve species (individual),
A = Area of the sampled area (m^2).

2.6.2. Biological index

The data were analyzed by calculating species diversity using the Shannon-Wienner diversity index (H'), uniformity index (E), and Simpson dominance index (D) according to Daulima *et al*. (2021).

3. Result and Discussion

3.1. Water quality parameters.

Measurement of water quality parameters was carried out simultaneously with bivalve sampling. The measurement results are presented in Table 2 below.

Table 2
The results of measuring water quality parameters at the study site.

No	Parameter	Stations (St)			Quality standard value*
		I	II	III	
1	Temperature (°C)	30,3	20,6	20,3	28-30 °C
2	pH	6,6	6,3	7,7	7-8,5
3	Salinity (ppt)	30,9	30,0	27,2	33-34
4	Substrate	sand	sand	mud	

* Indonesian Government Regulations No. 22 of 2021

Temperature is an essential factor for organisms. Temperature changes can cause differences in the composition and abundance of bivalves (Setiawan et al., 2021). If referring to Indonesian Government Regulations No. 22 of 2021, the temperature values at St II and St III are lower than the quality standard values; it is suspected that the time sequence of sampling and weather conditions are the factors causing the difference in temperature between St I and St II and St III. However, the temperature range between 20°C to 35°C can still be tolerated by Bivalvia (Purnama et al., 2019). The degree of acidity (pH) indicates the good and bad of water. The results of pH measurements showed that the pH value at the study site was good for the survival of bivalves. According to Effendi (2003), the ideal pH value for the life of marine organisms ranges from 6.7 to 8.2. Wahyuni et al. (2017) explained that bivalves live at the limit of the pH range of 5.8 - 8.3. Even though the pH values at St I and St II were below the quality standards, these values were sufficient to support the life of seagrasses and bivalves.

Salinity will affect the spread of organisms both vertically and horizontally. Van Diggelen & Montagna (2016) argues that salinity will directly affect populations of benthic organisms, such as Bivalvia, because they have different tolerance limits for salinity levels depending on the ability of these organisms to control their body's osmotic pressure. According to Yusuf & Kadim (2019), aquatic organisms can tolerate salinity values of 20-40 ppt.

The substrate is a mixture and fraction of soil silt, sand, and clay. The essential characteristics of waters greatly determine the existence of organisms in waters (Harahap, 2017; Kadim et al., 2022a). According to Kadim et al. (2022b), the basic substrate, flat stones and gravel, is a suitable environment for benthos, so it has high density and diversity. All stations met the requirements for bivalves' growth.

The arrangement of the basic substrate is essential for organisms that live in the substrate, such as bivalves. Bivalves generally live in sand or mud and even stick to rocky rocks. Macrobenthos have to burrow, deposit-eating properties tend to be abundant in silt and soft sediments, which contain high organic matter (Simarmata et al., 2020).

3.2. Community structure of bivalvia

Based on the results of observations, the community structure of bivalves was found to be represented by 6 species from 5 family groups, namely Arcidae (2 species), Astartidae (1 species), Cyrenidae (1 species), Cardiidae (1 species) and Ostreidae (1 species). The bivalves' composition at the three research stations can be seen in Table 2, while the abundance of species can be seen in Table 3 below.

Table 2
Composition and distribution of bivalves at each research station.

No	Family	Species	Station		
			I	II	III
1	Arcidae	*Anadara pilula*	√	√	-
		Anadara granosa	√	√	-
3	Cyrenidae	*Polymesoda erosa*	-	-	√
4	Astartidae	*Astarte borealis*	-	-	√
5	Cardiidae	*Cerastoderma edule*	√	-	-
6	Ostreidae	*Crassostrea virginica*	√	-	-

Table 3
The abundance of bivalve species at each research station.

No	Species	Station			mean (Ind/m^2)
		I	II	III	
1	*Anadara pilula*	0,87	0,27	0	0,38
2	*Anadara granosa*	0,53	0,13	0	0,22
3	*Polymesoda erosa*	0	0	3,13	1,04
4	*Astarte borealis*	0	0	1,00	0,33
5	*Cerastoderma edule*	1,07	0	0	0,36
6	*Crassostrea virginica*	0,07	0	0	0,02

Based on the calculation results, the total abundance of Bivalvia is 7.07 ind/m^2. The highest abundance was at St III, which was 4.13 ind/m^2, while the lowest abundance was at St II with an abundance value of 0.4 ind/m^2.

Station III has a high abundance value compared to other stations. The type of substrate at this station is very supportive of bivalves. This can be seen from the kind of substrate at this station, sandy mud for life, which digs holes at

a certain depth. Besides that, the depth is low so that the photosynthesis process can enter it, which is suitable for the life of marine biota. The Cyrenidae family is the most common species found at this station.

Station II has a very low abundance with the type of substrate at this station, namely sandy. Bivalvia prefers sandy areas to immerse themselves (dig burrows in the sand) and obtain food and water for survival (Riniatsih & Wibowo, 2010).

Physical properties and the type of substrate can cause differences in abundance. The type of substrate can affect the survival of bivalves. The more substrate types, the more communities will be found at each station (Izzah & Roziaty, 2016). In addition to the above factors, the presence of mussels in the waters is also influenced by the activities of the people who catch them every day, causing changes in the clam population (Fauzani, 2017). The diversity index, uniformity index, and dominance index of bivalves in the coastal waters in the village of Luntung at each station are presented in Figure 2 below.

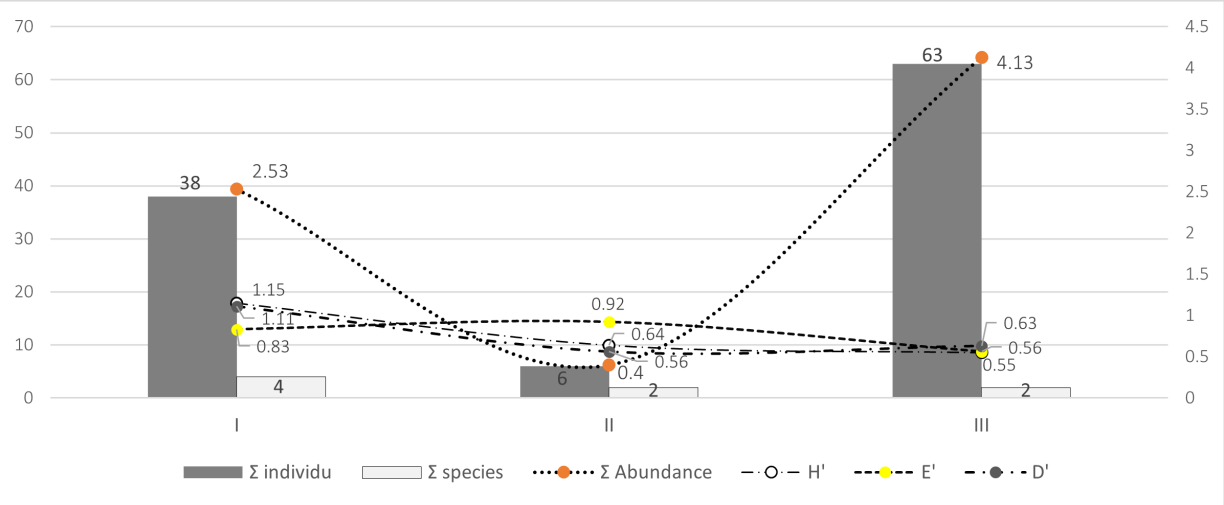

Figure 2. Graph of the total number of individuals of Bivalve species found based on the biological index values (H', E' and D') at each station.

The Bivalve population diversity index during the study showed a range of 0.55 to 1.15. This indicates that the diversity at St II and St III is in a low category while for St I it is in the medium category. The level of diversity in the low and medium categories shows that the distribution of individuals of each type is increasingly uneven. Agustini et al. (2019) stated that the number of species is decreasing, and there are more individuals, which will result in ecosystem instability. Arfiati et al. (2019) added that habitats, where the distribution of individuals is low or moderate, indicate that the waters are polluted.

The uniformity index value at all stations is close to 1, meaning that the individual distribution of each species at each station has moderate uniformity and no species dominates. The uniformity index value is close to 1, so the ecosystem is stable and describes no dominant species so that the distribution of the number of individuals in each species is uniform and even (Odum, 1998).

For the domination index, St I is in the high category, St III is in the medium category, and St II is in the low category, according to Odum (1998). A low dominance index is related to a uniformity index (Arfiati *et al*., 2019; Yusuf & Kadim, 2019). The low dominance index at station II indicates that Bivalvia is in good habitat conditions. Zulfiandi *et al*. (2012) stated that the greater the value of uniformity, the greater the type of uniformity. The density of each species is relatively the same and tends not to be dominated by certain types, and vice versa.

4. Conclusion

Based on the study's results, it can be concluded that the structure of the bivalve community in the coastal area of Lungkap Village is composed of 6 species representing the families Arcidae, Astartidae, Cyrenidae, Cardiidae and Ostreidae. The diversity index is in the low and medium categories. Moderate uniformity index without dominating species and low dominance index at St I. These results indicate that St II and St III are in polluted conditions.

Bibliography

Agustini, M., Muhajir, M., and Icak, I. 2019. Makrozoobentus dalam budidaya polikultur Desa Sawohan Sidoarjo. Jurnal Hasil Penelitian, 4(2), 148–158.

Arfiati, D., Herawati, E.Y., Buwono, N.R., Firdaus, A., Winarno, M.S., and Puspitasari, A.W. 2019. Struktur komunitas makrozoobentos pada ekosistem lamun di Paciran, Kabupaten Lamongan, Jawa Timur. JFMR-Journal of Fisheries and Marine Research, 3(1), 1–7. https://doi.org/10.21776/ub.jfmr.2019.003.01.1

Arikunto, S. 2006. Metode penelitian kualitatif. Jakarta: Bumi Aksara.

Ayunda, R. 2011. Struktur Komunitas Gastropoda pada Ekosistem Mangrove di Gugus Pulau Pari Kepulauan Seribu. Skripsi. Program Studi Biologi Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Indonesia. Depok.

Daulima, N., Kasim, F., Kadim, M.K., and Paramata, A.R. 2021. Struktur Komunitas dan Pola Sebaran Gastropoda pada Ekosistem Mangrove di Desa Bolihutuo, Kabupaten Boalemo, Gorontalo. *Acta Aquatica: Aquatic Sciences Journal*, *8*(3), 154–159. https://doi.org/10.29103/AA.V8I3.5855

Dhalia, E.G., Susetya, I.E., Patana, P., and Desrita. 2017. Identifikasi jenis-jenis bivalvia di Perairan Tanjungbalai, Provinsi Sumatera Utara Identification of bivalvia in Tanjungbalai Waters, North Sumatera Province. Acta Aquatica, 4(1), 13–20.

Dharma, B. 2005. Recent & Fossil Indonesian Shells. ConchBooks.

Djunaidi, S., Sahami, F.M., and Hamzah, S.N. 2014. Bentuk Pertumbuhan dan Kondisi Terumbu Karang di Perairan Teluk Tomini Kelurahan Leato Selatan Kota Gorontalo. In Nikè (Vol. 2, Issue 4). https://doi.org/10.37905/.V2I4.1274

Effendi, H. 2003. Telaah kualitas air, bagi pengelolaan sumber daya dan lingkungan perairan. Kanisius.

Fauzani, D.A. 2017. Analisis Sumberdaya dan Pemanfaatan Bivalvia Bernilai Ekonomis di Perairan Kampung Bugis, Kelurahan Tanjung Uban Utara, Kabupaten Bintan [Universitas Maritim Raja Ali Haji]. https://jurnal.umrah.ac.id/archives/8013

Febrina, M., Adi, W., dan Febrianto, A. 2018. Kelimpahan Bivalvia Di Ekosistem Lamun Pantai Puding Kabupaten Bangka Selatan. Akuatik: Jurnal Sumberdaya Perairan, 12(2), 64–75. https://doi.org/10.33019/akuatik.v12i2.702

Harahap, R.A. 2017. Jenis Kerang-Kerangan (Bivalvia) di Perairan Belawan Sumatera Utara [Universitas Medan Area]. http://repository.uma.ac.id/handle/123456789/9714

Husuna, R., Wantasen, A.S., and Rondonuwu, A.B. 2019. Structure Community of Mangrove at Tabulo Selatan Beach, Boalemo Regency. Jurnal Ilmiah PLATAX, 7(1), 309–319. https://doi.org/10.35800/JIP.7.1.2019.23406

Hutagalung, H.P., Setiapermana, D., dan Riyono, S. 1997. Metode Analisis Air Laut, Sedimen dan Biota, Buku 2. Puslitbang Oseanologi-LIPI. //oseanografi.lipi.go.id/katalogpustaka/index.php?p=show_detail&id=1039&keywords=

Izzah, N.A., dan Roziaty, E. 2016. Keanekaragaman makrozoobentos di Pesisir Pantai Desa Panggung Kecamatan Kedung Kabupaten Jepara. Bioeksperimen: Jurnal Penelitian Biologi. https://doi.org/10.23917/bioeksperimen.v2i2.2492

Kadim, M.K., and Arfiati, D. 2022. Effects of Pollutants on Physiological of River Macroinvertebrates: AReview. *EnviroScienteae*, *18*(1), 65–76. https://doi.org/10.20527/es.v18i1.12980

Kadim, M.K., Herawati, E.Y., Arfiati, D., and Hertika, A.M.S. 2022. Macrozoobenthic diversity and heavy metals (Pb and Hg) accumulation in Bone River Gorontalo Indonesia. *IOP Conference Series: Earth and Environmental Science*, *1118*(1), 012052. https://doi.org/10.1088/1755-1315/1118/1/012052

Kadim, M.K., Herawati, E.Y., Arfiati, D., Hertika, A.M.S., and Kasim, F. 2022. Distribution of heavy metal (Pb, Cd and Hg) concentrations in sediment of Bone River, Gorontalo. *Depik*, *11*(3), 282–287. https://doi.org/10.13170/depik.11.3.27775

Lutaenko, K.A., and Noseworthy, R.G. 2019. Contribution to the knowledge of the marine bivalve mollusk fauna of Gangwon Province, Korea. Journal of Asia-Pacific Biodiversity, 12(1), 14–44. https://doi.org/10.1016/J.JAPB.2018.07.009

Mohamad, F.K., Kasim, F., and Kadim, M.K. 2020. Composition and Distribution Patterns of Seagrass in the Gulf of Tomini. The NIKe Journal, 8(2). https://doi.org/10.37905/.V0I0.6890

Odum, E.P. 1998. Dasar-dasar Ekologi: Terjemahan dari Fundamentals of Ecology. Alih Bahasa Samingan, T. Edisi Ketiga. In Universitas Gadjah Mada Press, Yogyakarta (Vol. 697).

Oliver, P.G., Holmes, A.M., Killeen, I.J., Light, J.M., and Wood, H. 2004. Annotated checklist of the marine Bivalvia of Rodrigues. Journal of Natural History, 38(23–24), 3229–3272. https://doi.org/10.1080/00222930410001695097

Peraturan Pemerintah (PP) tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup, Pub. L. No. 22. 2021. https://peraturan.bpk.go.id/Home/Details/161852/pp-no-22-tahun-2021

Purnama, M.F., Admaja, A.K., dan Haslianti, H. 2019. Bivalvia dan Gastropoda Perairan Tawar di Sulawesi Tenggara. Jurnal Penelitian Perikanan Indonesia, 25(3), 191–202. https://doi.org/10.15578/JPPI.25.3.2019.203-214

Riniatsih, I., and Wibowo, E. 2010. Substrat Dasar dan Parameter Oseanografi Sebagai Penentu Keberadaan Gastropoda dan Bivalvia di Pantai Sluke Kabupaten Rembang. Indonesian Journal of Marine Sciences, 14(1), 50–59. https://doi.org/10.14710/IK.IJMS.14.1.50-59

Setiawan, B., Sahami, F.M., and Kadim, M.K. 2021. Analysis of Mercury Content in Bivalves in the Marine Waters around the Bone Bolango River Estuary. The NIKe Journal, 8(4). https://doi.org/10.37905/NJ.V8I4.9865

Simarmata, N., Adriman., dan Fajri, N.El. 2020. Struktur Komunitas Bivalva pada Ekosistem Mangrove di Kampung Madong Kelurahan Kampung Bugis, Kota Tanjungpinang, Kepulauan Riau. Jurnal Sumberdaya Dan Lingkungan Akuatik, 1(2), 159–169. https://jsla.ejournal.unri.ac.id/index.php/ojs/article/view/49

Talib, M.F. 2008. Struktru dan Pola Zonasi (Sebaran) Mangrove serta Makrozoobenthos yang Berkoeksistensi, di Desa Tanah Merah dan Oebelo Kecil Kabupaten Kupang [IPB University]. http://repository.ipb.ac.id/handle/123456789/5286

Van Diggelen, A.D., and Montagna, P.A. 2016. Is Salinity Variability a Benthic Disturbance in Estuaries? Estuaries and Coasts 2016 39:4, 39(4), 967–980. https://doi.org/10.1007/S12237-015-0058-9

Wahyuni, I., Sari, I.J., dan Ekanara, B. 2017. Biodiversitas

mollusca (gastropoda dan bivalvia) sebagai bioindikator kualitas perairan di kawasan pesisir Pulau Tunda, Banten. Jurnal Biodidaktika, 12(2), 46–48.

Yusuf, H., dan Kadim, M.K. 2019. Struktur Komunitas Echinodermata Pada Ekosistem Lamun Desa Taula'a Kecamatan Bilato, Kabupaten Gorontalo. DEPIK Jurnal Ilmu-Ilmu Perairan, Pesisir Dan Perikanan, 8(3), 207–216. https://doi.org/10.13170/depik.8.3.14288

Zulfiandi., Zainuri, M., dan Hartati, R. 2012. Struktur Komunitas Makrozoobentos di Perairan Pandaansari, Kecamatan Sayung Kabupaten Demak. Journal of Marine Research, 1(1), 62–66. http://ejournal-s1.undip.ac.id/index.php/jmr.50275Telp/Fax

Zvonareva, S.S., Mekhova, E.S., Hà, V.T., and Kantor, Y.I. 2019. Checklist of bivalve molluscs in mangroves of Khánh Hòa Province, Vietnam. Molluscan Research, 39(4), 296–312. https://doi.org/10.1080/13235818.2019.1638567