

Plankton Community Composition and Water Quality in Gili Ketapang, Probolinggo Regency, East Java

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Received: August 30, 2023

Revised: October 24, 2023

Accepted: November 25, 2023

Published: November 30, 2023

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DOI: [10.29303/jppipa.v9i11.5516](https://doi.org/10.29303/jppipa.v9i11.5516)

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Abstract: Gili Ketapang is an area with quite high fisheries potential, reaching 40% of the resource production in East Java. The catch season is often associated with the presence of plankton as the main source of food availability in marine ecosystems, influenced by season, weather, temperature, and water quality. The aim of this research is to report water quality results and analysis of phytoplankton and zooplankton composition in the coastal waters of Gili Ketapang, East Java. The method used in this research is quantitative descriptive to describe plankton composition and water quality in Gili Ketapang, East Java. In this study, 26 phytoplankton genera and 35 zooplankton genera were found. The abundance of phytoplankton and zooplankton measured in the West Season was lower compared to the abundance in Transition Season I. The phytoplankton and zooplankton diversity index showed moderate diversity ($1 < H' < 3$). In general, the results of water quality measurements obtained in the West Season were temperature 32.8°C, pH 8.54, dissolved oxygen 6.72 mg/L, salinity 32.66 ppt, Secchi depth 13.11 m, and nitrate 1.39 mg/L. Meanwhile, the water quality in Transition Season I was respectively temperature 30.26°C, pH 7.8, dissolved oxygen 8.24 mg/L, salinity 31.47 ppt, Secchi depth 10.92 m, and nitrate 1.21 mg/L.

Keywords: Gili Ketapang; Phytoplankton; Temperature; Water productivity; Zooplankton

Introduction

Coastal areas and small islands have very diverse natural resource potential and are important for social, economic, cultural and environmental development as well as supporting state sovereignty. Therefore, management must be sustainable and have a global perspective, taking into account the aspirations and participation of the nation, society and values based on national legal standards (UU No. 27, 2007). Indonesia's coastal areas, including parts of East Java, have stunning natural beauty and a variety of very important economic potential (Dewi et al., 2020). The Indonesian coast is one of the longest in the world (Trinanda, 2017), with a length of the Indonesian coastline of approximately 95,181 km (Sinabang et al., 2022; Yulianto et al., 2019).

East Java, as one of the provinces located on the island of Java.

Gili Ketapang is a village and small island located in the Madura Strait or about 8 km off the north coast of Probolinggo. Administratively, Gili Ketapang is part of Sumberasih District, Probolinggo Regency, East Java. This area has an area of around 68 hectares with a population of 8,402 people, the majority of whom work as fishermen. Gili Ketapang is one of the areas with quite high fisheries potential in Probolinggo Regency, as proven by the potential of fisheries resources in this area reaching 40% of the resource production in Probolinggo Regency, East Java (Hastari et al., 2017; Suhendra et al., 2021). The tidal area of Gili Ketapang Island has a diverse and stable shellfish community that provides ecosystem services such as turbidity reduction, induction of denitrification, and provision of habitat

How to Cite:

Putri, A. D. R., Sartimbul, A., & Yuniarti, A. (2023). Plankton Community Composition and Water Quality in Gili Ketapang, Probolinggo Regency, East Java. *Jurnal Penelitian Pendidikan IPA*, 9(11), 9290-9299. <https://doi.org/10.29303/jppipa.v9i11.5516>

complexity. Gili Ketapang Island is also a potential tourist destination in East Java, especially marine tourism such as snorkeling (Fakri et al., 2019). Apart from that, Gili Ketapang Island is also a research location for fisheries resource management by empowering local wisdom (Primyastanto, 2015).

Indonesian sea waters are influenced by seasonal factors that influence oceanographic conditions such as temperature, salinity, wind, rainfall and solar radiation (Tuapetel, 2021). Generally, it is influenced by the monsoon system which causes changes in wind direction and speed, thereby affecting surface currents in the waters. The movement of surface currents affects the distribution of sea surface temperatures in waters. The specific influence of seasons on the condition of Indonesian waters varies depending on the location and type of data analyzed (Habibi et al., 2021). Upwelling events that periodically take place during the east season (June to August) in the Flores Sea and southern Java are thought to be a trigger factor for the spawning process of flying fish (Excoetidae), while the north equatorial current pattern in the Sulawesi Sea is an oceanographic factor that influences the reproductive cycle of flying fish (Excoetidae) (Tuapetel, 2021). Current is also a hydro-oceanographic parameter that influences the condition of sea waters. Current is the movement of water masses which is influenced by wind, water density and pressure differences which results in the transport of water materials from the surface and water column (Prayogo, 2021).

The dynamics that occur in the waters of the strait are generally clearly visible through changes in water color in certain seasons which are influenced by the flow of water masses from land. Likewise, strong currents play a role in the mixing process, influencing the distribution of suspended solids and fluctuations in other parameters. From an ecological point of view, this process is actually necessary for marine organisms to increase the amount of dissolved oxygen and nutrients in the water. The horizontal transport of water masses in the form of heat, humidity and salinity from the sea surface through evaporation has an impact on the distribution of suspended material and the abundance of zooplankton (Rozirwan et al., 2020). Apart from seasons, there are physical and chemical factors in water quality that can affect the life of aquatic organisms, including the structure of plankton communities in marine waters both directly and indirectly. The abundance, diversity and dominance of plankton species can be influenced by factors such as nutrient availability, salinity, temperature and pollution (Husnah et al., 2017; Titaley et al., 2021). Plankton community structure can also be used as an indicator of the health of aquatic ecosystems, and changes in

community structure can indicate environmental disturbances (Song et al., 2023).

Plankton are planktonic animals that live in the water column and move from one place to another following the current. Taxonomically, plankton are divided into several groups, namely; Phytoplankton, generally in the form of single-celled microalgae (blue algae, green algae and brown algae), are autotrophic organisms that can photosynthesize (Mulyawati et al., 2019; Putri et al., 2019). Meanwhile, zooplankton, namely plankton which is an animal (Japa et al., 2013). The existence of plankton plays an important role in the primary productivity of marine ecosystems because they are the basis of the marine food chain (Putri et al., 2019). Plankton is affected by environmental conditions such as the physical and chemical properties of the water and the season (Haribowo et al., 2021). The concentration of nutrients in the water is lower during the rainy season compared to the dry season, resulting in lower plankton density during the rainy season (Haribowo et al., 2021; Nirmalasari et al., 2016). The abundance and distribution of plankton can have a significant impact on fish populations, as plankton is a primary food source for many fish species (Chodriyah, 2017; Sihombing et al., 2017). Therefore, identifying and monitoring plankton populations can be important for understanding and managing fish populations.

Currently there is not much direct information regarding water conditions in Gili Ketapang, East Java. However, research in 2021 regarding the ecology and environment of Gili Ketapang Island shows an ecological condition characterized by a decline in environmental quality which has an impact on coral conditions and a decrease in fish abundance (Rijal et al., 2021). In particular, quantitative and qualitative changes at lower trophic levels (i.e. phytoplankton and zooplankton) caused by environmental changes can lead to major changes in marine ecosystems through food webs. Therefore, this study aims to report water quality conditions and quantitative changes (abundance, biodiversity) in plankton communities that occur in the waters of Gili Ketapang, East Java.

Method

The method used in this research is descriptive. This study aims to report the structure of the plankton community found in the Gili Ketapang Coastal Waters area, East Java. The sampling location was carried out in residential areas (7°4'33.24"S, 113°15'12.84"E) in Gili Ketapang Coastal Waters, East Java. Sampling in this study was based on the seasonal winds that occur in Indonesian waters, consisting of: West Season: December - February (Representative sampling in

February and December); Transition Season I: March-May (Suhery et al., 2023).

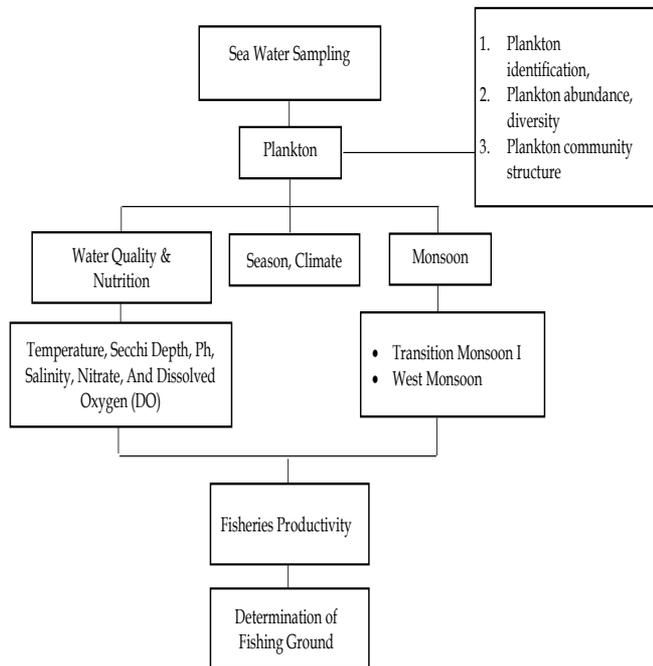


Figure 1. Research conceptual

Sampling was carried out to collect water and plankton samples with three repetitions. Observation parameters include identification, abundance and diversity index of phytoplankton or zooplankton. Sampling was carried out by filtering 20 L of sea water vertically and horizontally with plankton net No.25 (mesh size 20 µm). The results of the seawater were transferred to a 100 ml sample bottle which had been labeled differently. To maintain sample quality, approximately 5-6 drops of 1% Lugol solution were added. Then, stored in a cool box to be observed at the Hydrobiology Laboratory, Faculty of Fisheries and Marine Sciences, Brawijaya University.

Identify Plankton

After the samples were obtained, plankton were then identified using a light microscope with a lens magnification of 100x and 200x based on the Sedgewick Rafter method. Identify types of phytoplankton and zooplankton by reading a marine plankton reference book. Then, data collection analysis was carried out on the number of phytoplankton and zooplankton cells. Plankton type identification activities use Davis' (1955) identification logbook to determine the type of plankton obtained and then calculate the abundance, dominance and evenness of the organisms.

Calculation of Plankton Abundance

Next, plankton abundance is calculated using the following formula 1.

$$N = \frac{T \times V \times n}{L \times v \times p \times W} \tag{1}$$

Description:

- n : The number of plankton counted in the microscope
- Q : Broad glass cover (mm²)
- L : Spacious airy: point of view (mm²)
- P : The number of fields of view is observed
- V : Sample Volume of plankton are filtered (ml)
- v : Sample Volume of plankton under the glass cover (ml)
- W : Sample Volume of plankton are filtered (liter)
- N : The number of cells or Individuals per liter (cells/L, ind/L)

Plankton Diversity Index (H')

The Diversity Index is an index that shows the level of diversity of types of organisms that exist in a community. Calculation of the diversity index using the Shannon-Wiener index equation according to Jhingran et al. (1989) as equation 2.

$$H' = i - \sum Pi \cdot \ln Pi \tag{2}$$

Information:

- H' : Diversity Index
- Pi : ni/N
- ni : Number of individuals of type i
- N : Total number of individuals

There are diversity index criteria which are divided into 3 categories, namely:

- H' < 1 : Low species diversity
- 1 < H' < 3: Medium species diversity
- H' > 3 : High species diversity

Water Quality Measurement

Water quality measurements were carried out to obtain supporting data for this research. Parameters measured include temperature, Secchi depth, pH, Salinity, Nitrate, and Dissolved Oxygen (DO). Secchi depth is measured using a Secchi disc. Temperature and dissolved oxygen are measured using a DO meter. Nitrate samples were taken using a 1.5 L water sampler at a depth of 2.5 meters. Sampling was carried out three times. Then put the water sample obtained into a 500ml bottle and store it in the refrigerator. The samples were then tested for nitrate content and analyzed using a 410 nm spectrophotometer at the Hydrobiology Laboratory, Faculty of Fisheries and Marine Sciences, Brawijaya University. pH value is measured using a pH meter. The data obtained is then presented descriptively.

Results and Discussion

Identify Types of Plankton

The results of plankton identification in Gili Ketapang coastal water samples found 26 phytoplankton genera and 35 zooplankton genera. Phytoplankton species found include *Alexandrium sp.*, *Amphora sp.*, *Asterionella sp.*, *Bacteriastrum sp.*, *Biddulphia sp.*, *Cerataulina sp.*, *Chaetoceros sp.*, *Coscinodiscus sp.*, *Cyclotella sp.*, *Ditylum sp.*, *Entomoneis sp.*, *Hemiaulus sp.*, *Lauderia sp.*, *Meuniera sp.*, *Navicula sp.*, *Odontella sp.*, *Peridinium sp.*, *Planktoniella sp.*, *Pleurosigma sp.*, *Protoperidinium sp.*, *Rhizosolenia sp.*, *Skletonema sp.*, *Stephanopyxis sp.*, *Thalassionema sp.*, *Triceratium sp.*, *Trichodesmium sp.*

Most of the types of phytoplankton found belong to the dinoflagellate and diatom families, as well as the Bacillariophyceae class. Several studies have identified the abundance and diversity of phytoplankton in certain areas of the Indonesian coast. For example, research in Kampung Baru, Bintan Island, found 5 divisions and 29 genera of phytoplankton (Anisa et al., 2022). Other research in Timbulsloko Village, Demak Regency, identified 17 phytoplankton genera from 4 classes (Fatma et al., 2022). In Brondong Coastal Waters, Lamongan, East Java, the types of phytoplankton identified are Dinophyceae and Bacillariophyceae (Aryawati et al., 2016). The Bacillariophyceae class is a type of phytoplankton that is able to grow quickly, has good adaptability to the environment, is cosmopolitan, has strong resistance to extreme conditions and has high production capacity even in relatively extreme or low nutrient and light conditions (Baytut, 2013). Apart from that, monsoonal conditions supported by water hydrodynamics (tides, currents), upwelling mechanisms, release time and water macronutrients spatially also influence the level of phytoplankton abundance in an aquatic ecosystem. These studies show that phytoplankton species in Indonesian coastal waters are diverse and can vary depending on location and environmental conditions.

Meanwhile, the zooplankton species found included *Acanthometron sp.*, *Acartia sp.*, *Amphilitium sp.*, *Amphisolenia sp.*, *Atlania sp.*, *Calanus sp.*, *Centropages sp.*, *Ceratium sp.*, *Codonellopsis sp.*, *Copila sp.*, *Corycaeus sp.*, *Cosmocalanus sp.*, *Dictyocha sp.*, *Dinophysis sp.*, *Diploconus sp.*, *Eiterpina sp.*, *Evadne sp.*, *Favella sp.*, *Lepidasthenia sp.*, *Leptocylindrus sp.*, *Macrosetella sp.*, *Nannocalanus sp.*, *Neocalanus sp.*, *Neomysis sp.*, *Oikopleura sp.*, *Oithona sp.*, *Ornithocercus sp.*, *Paracylopia sp.*, *Parafavella sp.*, *Pelagobia sp.*, *Phyrophacus sp.*, *Rhincalanus sp.*, *Sagitta sp.*, *Sapphirina sp.*, *Stauracantha sp.*

Zooplankton and phytoplankton have a close relationship in aquatic ecosystems. Phytoplankton are primary producers, while zooplankton are primary

consumers. Zooplankton feed on phytoplankton, and their abundance is often related to phytoplankton abundance. Plankton community composition depends on the physical and chemical characteristics of the water, such as temperature, salinity, pH, and nutrient levels (Takarina et al., 2018). The relationship between zooplankton and phytoplankton can also influence the distribution of dimethyl sulfide (DMS) in the sea (Armus et al., 2019). Zooplankton species found in the sea can vary depending on the location and time of sampling. The research results of Anita et al. (2020) show that several zooplankton species found in the coastal waters of Koenoe, Southeast Sulawesi are 16 genera from 5 zooplankton classes, namely from the crustacean class (5 genera), the Maxillopoda class (3 genera), the hexanauplia class consisting of (4 genera), ciliate class (2 genera) and oligotricha class (2 genera).

Abundance of Plankton Types

Table 1 shows that the phytoplankton abundance value in measurements during the West Monsoon in each repetition was lower (1086.40 cells/L) compared to the phytoplankton abundance in measurements during the 1st Transition Monsoon (1174.40 cells/L). This can happen depending on the intensity of rainfall in the west season. The abundance of phytoplankton is influenced by the intensity of the rainy season, and its abundance is directly proportional to the intensity of the rainy season (Nirmalasari et al., 2016). In addition, phytoplankton are organisms that need nutrients to support their growth, and high nutrient content in waters can increase the abundance of phytoplankton and vice versa (Wijaya et al., 2022).

Table 1. Results of Calculating the Abundance of Phytoplankton Types

	An abundance of types (cells/L)			Total
	1	2	3	
Transition monsoon I	402.40	413.60	358.40	1174.40
West monsoon	284.80	300.00	501.60	1086.40

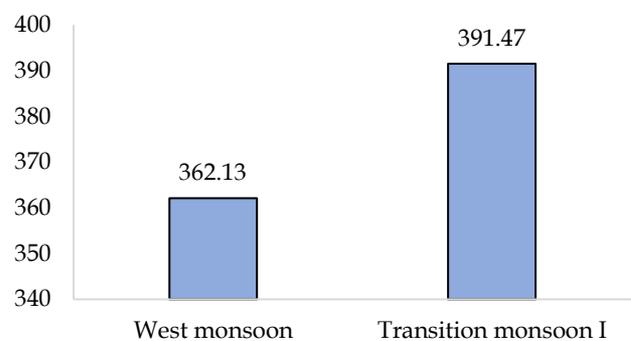


Figure 2. Graph of calculation of the average abundance of phytoplankton in the transition season 1 and the west season

Table 2 shows that the value of zooplankton abundance in measurements during the West Monsoon in each repetition was lower (108.8 ind/L) compared to the zooplankton abundance in measurements during the 1st Transition Monsoon (116.8 ind/L). Seasonal changes are believed to have a strong impact on the dynamics of the physicochemical parameters of Maspari Island waters such as turbidity, flow rate, density, salinity, pH, temperature and nutrients (nitrate and phosphate) which are very important for zooplankton (Gogoi et al., 2019). The abundance of zooplankton plays an important role in the food chain and can be an indicator of aquatic fertility. Its existence is known to be strongly influenced by the dynamics of physicochemical parameters due to its limited mobility (Azmi et al., 2016). Apart from the season, High or low zooplankton abundance is caused by a number of additional factors such as predators, prey, and the physical environment, which may also play an important role in the distribution of the organisms. The abundance of zooplankton in an area will cause an abundance of small fish, large fish and finally it will become a fishing area (Pello et al., 2021; Rozirwan et al., 2020).

Table 2. Results of Calculating the Abundance of Zooplankton Species

	An abundance of types (ind/L)			Total
	1	2	3	
Transition monsoon I	45.6	37.6	33.6	116.8
West monsoon	19.2	24	65.6	108.8

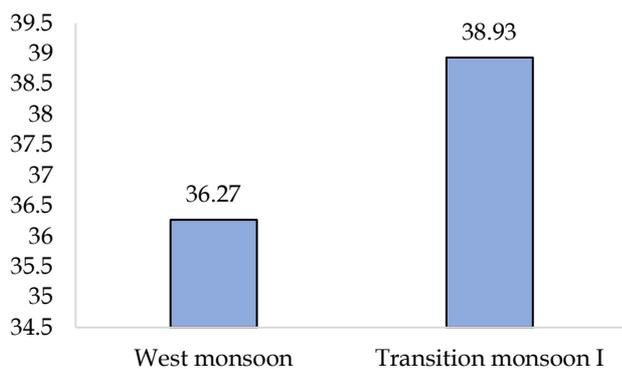


Figure 3. Graph of calculation of the average abundance of zooplankton in the transition season 1 and the west season

Zooplankton feed on phytoplankton, and their abundance is often related to phytoplankton abundance (Chen et al., 2021; Wang et al., 2022). The relationship between zooplankton biomass and phytoplankton biomass can provide an overview of the structure and function of the biological community of a body of water (Yuan et al., 2018). The abundance of phytoplankton is the main food source for zooplankton, and its abundance is often linked to the abundance of

phytoplankton (Chen et al., 2021). Studies on the relationship between zooplankton and phytoplankton communities and environmental factors have been carried out in various regions. The abundance of phytoplankton and zooplankton can vary depending on the season and location (Selifonova et al., 2021).

Plankton Diversity Index

Table 3 shows that the phytoplankton diversity index value between the transition season and the west monsoon is not much different (1.8-1.87). Overall, the phytoplankton diversity index found in this study included moderate diversity ($1 < H' < 3$). When viewed from the number of species and the number of phytoplankton found, it is quite diverse. Diversity depends on important ecological processes such as competition, predation, and succession, and changes in these processes can alter species diversity indices. The plankton diversity index can be used as an indicator that an ecosystem is experiencing pollution or eutrophication. Increasing diversity values means water quality is restored. Lower species diversity indicates the impact of pollution (Ali et al., 2016).

Table 3 shows that the zooplankton diversity index value between the transition season and the west monsoon is the same, namely 1.28. Overall, the zooplankton diversity index found in this study included moderate diversity ($1 < H' < 3$). If we look at the number of species and the number of zooplankton found, it is also very diverse. The structure and heterogeneity of zooplankton communities is the result of complex interactions between biotic and abiotic components (Chará-Serna et al., 2021). Diversity represents the number of species that are able to adapt to the environment in which the organism lives. A high H' value indicates that the regional ecosystem is able to survive in environmental balance. The response of different taxa to global warming will lead to spatial restructuring of plankton ecosystems with possible consequences for grazing pressure on phytoplankton and hence for biogeochemical cycles, higher trophic levels and biodiversity (Chivers et al., 2017).

Table 3. Results of Calculating the Diversity Index (H') of Phytoplankton and Zooplankton

Diversity index (H')	Transition monsoon I	West monsoon
Phytoplankton	1.80	1.87
Zooplankton	1.28	1.28

Plankton play an important role in the flow of trophic energy and material transfer in marine ecosystems and food webs (food chains) as well as in biogeochemical circulation. Research shows that plankton communities play an important role in maintaining trophic relationships and biological

production of ecosystems. In addition, their role in the sustainable use of resources has been recognized, analyzed, described and explained. Further studies of plankton communities show that the structure and distribution of plankton communities reflect the oceanographic characteristics of the seas that inhabit them (Liu, 2013).

Water Quality

The results of water quality measurements in the coastal waters of Gili Ketapang can be seen in Table 4. Based on the results obtained, the parameter values for temperature, brightness, pH, salinity, nitrate and dissolved oxygen are still in optimum conditions according to the quality standard limits stipulated in the Decree of the State Minister for the Environment No. 51

of 2004 concerning sea water quality standards. The results of temperature measurements were carried out in each season, which occurred three times. It was found that the average temperature value in the coastal waters of Gili Ketapang during the west monsoon was 32.8°C, during Transition Monsoon I it was 30.26°C. The surrounding air temperature and the intensity of light entering the water body affect changes in temperature values. Air temperature and the intensity of light entering the waters can influence changes in water temperature which in turn can affect fish life, including metabolism, growth, feeding, and swimming speed. High water temperatures can increase fish metabolism and affect reproduction, but can also inhibit growth and even cause death (Jo et al., 2019).

Table 4. The Results of the Water Quality Analysis

Parameters	Units	West monsoon	Transition monsoon I	Ministry of environment no. 51 of 2004
Temperature	°C	32.80	30.26	28 - 32
pH	-	8.54	7.8	7 - 8.5
Dissolved oxygen (DO)	mg/L	6.72	8.24	>5
Salinity	ppt	32.66	31.47	34
Secchi Depth	m	13.11	10.92	>5
Nitrate (NO ₃)	mg/L	1.39	1.21	0.008

The average value of brightness in the waters around Gili Ketapang coastal waters during the west monsoon is 13.11 m, during Transition Monsoon I it is 10.92 m. Water brightness can influence community structure and abundance of seawater plankton. Several studies show that sea water brightness can influence the diversity and abundance of coral fish (Pet-Soede et al., 2001). Apart from that, the impact of the El Niño phenomenon can increase chlorophyll-a concentrations which will affect primary productivity. This is because chlorophyll-a in these waters can utilize light intensity optimally for photosynthesis (Semedi et al., 2015). Therefore, sea water brightness can also influence the abundance and structure of sea water plankton communities.

The results of measuring the degree of acidity (pH) tend to be homogeneous. The average value of pH in the coastal waters of Gili Ketapang during the west monsoon was 8.54, during Transition Monsoon I it was 7.80. Based on the Decree of the Minister of Environment No. 51 of 2004 concerning Seawater pH Quality Standards, specifically 7.00-8.5. However, with a tolerance of 0.2 for each limit, all measured pH is within the specified quality standard range. Changes in pH affect most aquatic organisms. pH also influences biochemical processes such as nitrification and phytoplankton. However, the pH value is still within the range that suits the needs of aquatic organisms (Semedi et al., 2015).

The salinity measurement results occurred in the west season, namely 32.66 ppt and the lowest salinity level occurred in the first transition season, namely 31.47 ppt. Water circulation patterns, rainfall and river flows influence the distribution of salinity. Different evaporation and rainfall rates can also cause varying salinity levels. When water evaporates, it leaves salt behind, which increases the salinity of the remaining water. Conversely, when it rains, fresh water dilutes the salt concentration, thereby reducing salinity. River currents can also influence salinity by carrying fresh water into the sea so that it can reduce the salinity of the surrounding sea water. Overall, the distribution of salinity in waters is influenced by the complex interaction of various factors, including circulation patterns, rainfall, evaporation, and river flows (Lie et al., 2016).

The results of nitrate measurements in the coastal waters of Gili Ketapang during the west monsoon were 1.39 mg/L, during Transition Monsoon I it was 1.21 mg/L. Nitrate levels are one of the parameters that influence plankton community structure. Nitrate is an organic material utilized by marine organisms. Nitrate levels are really needed by phytoplankton. The high influence of land runoff provides a lot of organic substances from anthropogenic waste which is waste from various human activities. The relationship between nitrate is very closely related to sea surface temperature. When sea surface temperatures are low and nutrient

concentrations increase, this occurs due to the influence of strong upwelling (Yolanda et al., 2016).

The average value of dissolved oxygen (DO) in the waters around Gili Ketapang coastal waters during the west monsoon is 6.72 mg/L, during Transition Monsoon I it is 8.24 mg/L. Dissolved oxygen levels can play a role in shaping the abundance and structure of plankton communities and other marine organisms. Many special elements can be used as indicators of system health, including for example important chemical factors such as dissolved oxygen (DO) content in water bodies or biological aspects such as the abundance of zooplankton in these waters and so on. For aquatic heterotrophic organisms, dissolved oxygen (DO) is the only source of oxygen and it acts as an important factor not only in survival but also in regulating subsequent metabolic and trophodynamic activities (Banerjee et al., 2019).

Conclusion

The results of plankton identification in water samples on the coast of Gili Ketapang found 26 genera of phytoplankton and 35 genera of zooplankton. The abundance of phytoplankton and zooplankton measured during the West Monsoon was lower than the abundance during the 1st Transition Monsoon. The phytoplankton and zooplankton diversity index shows moderate diversity ($1 < H' < 3$). So that the ecosystem is quite capable of surviving in environmental balance. In general, the water quality measurement results obtained during the West Monsoon were temperature 32.8°C, pH 8.54, dissolved oxygen 6.72 mg/L, salinity 32.66 ppt, Secchi depth 13.11 m, and Nitrate 1.39 mg/L. Meanwhile, the water quality during Transition Monsoon I was respectively temperature 30.26°C, pH 7.8, dissolved oxygen 8.24 mg/L, salinity 31.47 ppt, Secchi depth 10.92 m, and Nitrate 1.21 mg/L. Water quality conditions can cause changes in species dominance, community structure and plankton biomass as a form of adaptation to changes in aquatic ecological conditions which are characterized by the abundance and composition of the plankton found.

Acknowledgments

The authors are grateful to the Freshwater Fisheries Laboratory, Faculty of Fisheries and Marine Sciences, Brawijaya University.

Author Contributions

All authors have contributed to the final manuscript. The contribution of each author as follows, ADRP, AS and AY: Conception and study design. ADRP and AS: acquisition of data. ADRP, AS and AY: Data analysis and interpretation. ADRP and AY: Drafting the manuscript. ADRP, AS and AY: Revising the manuscript critically for important intellectual content. All authors read and approved the final manuscript.

Funding

This research was funded independently and did not receive funding from any institution.

Conflicts of Interest

The authors declare that they have no competing interests.

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