

DENSITY OF NERITIDAE IN THE COASTAL WATERS OF SERI VILLAGE, AMBON CITY

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ABSTRACT

These marine natural resources include various types of fish, molluscs, and crustaceans. Maluku is a waters rich in benthic organisms, the coastal environment of Seri village can be said to be productive which shows various types of resources that can be utilized continuously in the presence of various types of marine organisms or marine biota such as Nerita. This research is a form of scientific contribution to learning marine biology. This research is a descriptive type of research, to describe or describe information about the density of Neritidae in the coastal waters of Seri Village which is made in the form of tables and figures. The results of the calculation of the density of Neritidae in the coastal waters of Desa Seri which were carried out as a whole from 3 transects found 7 species, 1 family, 1 genus and 207 individuals in the phylum Mollusca. By calculating the density on the coast of Seri Village, the values for each species are as follows: *Nerita squamulata* is 0.001833, *Nerita chamaeleon* is 0.002167, *Nerita maxima* is 0.002167, *Nerita polita* is 0.026333, *Nerita albicilla* is 0, 0015, *Nerita planospira* was 0.000333 and *Nerita patula* was 0.000167 with a total absolute density of 0.0345. according to the density category according to Cox (1967) which explains that 0 = no density, 1-10 = less density, 10-20 = sufficient density and > 20 = very high density, thus it can be concluded that Neritidae in coastal waters of Seri village is no density.

Keywords: *neritidae, density, coastal*

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INTRODUCTION

Indonesia is an archipelagic country with a wealth of marine natural resources that have the potential to be utilized sustainably. These marine natural resources include various types of fish, mollusks and crustaceans. Coastal communities have long utilized marine natural resources as a source of food, minerals, medicines and energy (Gordon 2000, South & Skelton 2000). The world's oceans are a unified ecosystem where a series of communities can influence the physical and chemical factors of the surrounding sea water. This large ecosystem can be divided into small areas where physical and chemical parameters have different influences on the population of these areas (Nybakken, 1998). One of them is the Maluku Islands. Maluku is a body of water rich in benthic organisms. This type of organism is widely used by the population for food needs and can provide encouragement to search for new fisheries resources in the sea. The existence

of these resources certainly provides special hope for people living in coastal areas to utilize these resources for daily consumption. Neritidae is an organism that has an important role in ecological functions in aquatic ecosystems.

The coastal waters of Seri Village are quite good coastal waters because they have the characteristics of beautiful coastal waters. Furthermore, the coastal environment can be said to be productive, which shows various types of resources that can be utilized continuously by the presence of various types of marine organisms or marine biota such as Nerita and other types. The coastal waters of Seri Village are quite extensive waters that have various types of substrate, namely sandy, muddy and rocky, which are broken off dead coral. Apart from that, the coastal waters of Seri village are well known as a search object. Generally, coastal communities in the coastal waters of Seri village use these waters as a place to catch coral fish, and search for several types of neritidae to consume when sea water recedes so that the resources are abundant and have the potential to be utilized by humans as a source of food. Nerita is a family that is common throughout the world, especially in tropical and subtropical areas, but with representative representatives found in temperate seas. As well as being found in sea and estuarine conditions (brackish), in tropical climates they also live in fresh water.

On tropical and subtropical coasts they are a group of molluscs that are abundant, especially in the intertidal zone. Most Nerita species live on rocky beaches and coral reefs, often exposed to sunlight, or live in crevices or under rocks and seaweed. They are usually active when wet and during high tides. The Neritidae family of 188 is found in the sea, brackish water and clean water. Along the coast, they are plant eaters usually in the mid to surface zone in the littoral zone and it is known that they have many colonies. Specifically, the Nerita species consists of a pair of bipectinate gills, shell and operculum, and has separate genitals. Neritide's fertilization process occurs internally. Identifying Nerita's gender can be done by looking at the appearance of a triangular penis to the right of her tentacles.

METHOD

This type of research is describe the density of Neritidae in the waters of Seri Village Beach.

Procedure

- a. Field Observations
 - a. Initial observations
 - b. Observation of neritidae and measurement of environmental parameters
 - c. Neritidae sample collection
1. Before taking Nerita samples in the intertidal zone, wait first when the water conditions are completely receding so that it doesn't make the sampling process difficult.
 2. After that, prepare the tools you want to use, especially the Paralon used for taking Nerita samples.
 3. Before taking samples, first measure the temperature, salinity, pH, and also Do (Dissolved oxygen) in sea water and after that the samples are taken by placing a paralon pipe under the substrate on transect 1 plot 1, this is carried out until plot 7.
 4. After that, look for Nerita which is only found on the inside of the paralon pipe. And don't take Nerita that is outside the paralon pipe.
 5. After that, the Nerita samples are taken and filled in each plastic sample which is then labeled (transect and plot). After taking samples on transect 1 plots 1 to 7, then do the same thing again on transect 2 plots 1 to 7 and also transect 3 plots 1 to 7.
 6. After the Nerita sample collection has been completed, the tools that have been used are washed thoroughly using distilled water to prevent rust on the tools.
 7. Then the Neritidae samples were taken to the Ambon Deep Sea Research Center Laboratory (LIPI) for identification.

DISCUSSION RESULT

Seri village beach is a beach with various types of substrate, namely sand, muddy and rocky which are broken off dead coral. Desa Seri Beach is known as a tourist attraction and people generally use these waters as a place to catch fish and gastropods for consumption.

1. Conditions of Physical and Chemical Environmental Factors at the Research Location

The physicochemical environmental factors measured in this research are temperature, salinity, dissolved oxygen (DO) and pH. measurement of physicochemical factors simultaneously with data collection on the types of nerita located on the Dusun Seri beach. Next, we will explain the physical and chemical factors in the coastal waters of Dusun Seri.

1. Temperature

The results of temperature measurements at the observation station in the coastal waters of Seri Village showed that the highest temperature at the time of sampling was 29.9°C while the lowest temperature was 23.6°C. Measure the temperature in the initial plot and final plot to determine the difference in temperature values in the two plots. Because changes in temperature in the initial plot and final plot also affect the types of organisms that live and survive in certain water areas.

Table 1. Seawater Temperature Measurement Results °C (Plot).

Transect	Plots	
	Start	Finish
I	23,6°C	23,6°C
II	29,9°C	23,8°C
III	23,9°C	23,8°C

2. pH

The results of pH measurements at the observation station location in the waters of Seri Village Beach showed that the highest pH was 8.2 and the lowest pH was 7.8. Measure the PH in the initial plot and final plot to determine the difference in Ph values in the two plots. Because changes in Ph in the initial plot and final plot also affect the types of organisms that live and survive in certain water areas.

Table 2. Seawater pH Measurement Results (Plot)

Transect	Plots	
	Start	Finish
I	8,1	8,0
II	7,8	8,2
III	7,8	8,2

3. Salinity

The results of salinity measurements at the observation station location in the waters of Seri Village Beach show that the highest salinity is 32 (‰) and the lowest salinity is 26 (‰). Measurement of salinity in the initial plot and final plot to determine the difference in salinity values in the two plots. Because changes in salinity in the initial plot and final plot also affect the types of organisms that live and survive in certain water areas.

Table 3. Seawater Salinity Measurement Results (‰) (Plot)

Transect	Plots	
	Start	Finish
I	26	32
II	32	30
III	30	32

4. Dissolved Oxygen (DO)

Based on measurements of dissolved oxygen in sea water at the observation station in the coastal waters of Seri Village, it shows that the highest level of dissolved oxygen (DO) is 14.4 mg/l, and the lowest is 10.1 mg/l. DO measurements in the initial plot and final plot to determine the difference in DO values in the two plots. Because changes in DO in the initial plot and final plot also affect the types of organisms that live and survive in certain water areas.

Table 4. Seawater DO Measurement Results Mg/1 (Plot).

Transect	Plots	
	Start	Finish
I	14,4	14,3
II	10,1	14,0
III	10,3	14,0

5. Substrate

The results of descriptive visual observations of substrate types on 3 observation transects in the waters of Seri Village Beach showed that 3 types of substrate were obtained, namely sandy, coral and moss. Can be seen in the table below:

Table 5. Substrate Type Collection (Plot)

Plots	Transect	1	2	3
1		rocks, coral, sand	mossy rocks, sand	Black stone, sand
2		Dead rock, coral, sand	moss-covered rocks, sand	Black stone, coral stone, coral
3		coral, seagrass, sand	coral, seagrass, sand	black stone, sand
4		coral, seagrass, sand	coral, seagrass, sand	patterned stone, sand, alkaline coral
5		coral, dead rock, sand	dead rock coral, sand	mossy stones, sand, patterned stones
6		dead rocks, coral folds, sand	dead rock coral, moss, sand	coral, patterned stones, sand
7		coral folds, dead rock	coral folds, dead rock	rocks, seagrass, sand

6. Identify the types of Nerita on Seri Village beach

The results of research carried out on the Seri Village beach covering an area of 6,000 m² in this area found 7 types of Nerita. Based on the results of observations made in the coastal waters of Seri Village, the types of Nerita are seen in Table 6.

Table 6. Types of Nerita found on Seri Village beach

No	Family	Genus	Spesies
1			<i>Nerita squamulata</i>
2			<i>Nerita chamaeleon</i>
3	Neritidae	Nerita	<i>Nerita maxima</i>
4			<i>Nerita polita</i>
5			<i>Nerita albicilla</i>
6			<i>Nerita planospira</i>
7			<i>Nerita patula</i>

The 7 types of neritidae found are; *Nerita squamulata*, *Nerita chamaeleon*, *Nerita maxima*, *Nerita polita*, *Nerita albicilla*, *Nerita planospira* and *Nerita patula*. Below is a description of each species.



Nerita squamulata



Nerita Chamaeleon



Nerita Maxima



Nerita Polita



Nerita Albicilla



Nerita Planospira



Nerita Patula

7. Number of *Nerita* individuals found in the coastal waters of Seri Village

Table 7. Number of *Nerita* individuals found on Seri village beach

No	Species	Number
1	<i>Nerita Squamulata</i>	11
2	<i>Nerita Chamaeleon</i>	13
3	<i>Nerita Maxima</i>	13
4	<i>Nerita Polita</i>	158
5	<i>Nerita Albicilia</i>	9
6	<i>Nerita Planospira</i>	2
7	<i>Nerita Patula</i>	1

8. *Nerita* density on Seri Village beach

The results of the analysis of the absolute density of *Neritidae* found in the coastal waters of Seri village were 0.0345, in accordance with the density category according to Cox (1967) which explains that 0 = no density, 1-10 = low density, 10-20 = sufficient density and > 20 = very high density, thus it can be

concluded that there is no density of Neritidae in the coastal waters of Seri village. A summary of the density analysis results can be seen in table 8.

Table 8. Calculation of Neritidae density

No	Species	Number	Absolute Density (KA)	Relative Density (KR) (%)
1	Nerita Squamulata	11	0,001833	5,31401
2	Nerita Chamaeleon	13	0,002167	6,280193
3	Nerita Maxima	13	0,002167	6,280193
4	Nerita Polita	158	0,026333	76,3285
5	Nerita Albicilla	9	0,0015	4,347826
6	Nerita Planospira	2	0,000333	0,966184
7	Nerita Patula	1	0,000167	0,483092
Number		207	0,0345	100

Based on the results of measurements of environmental parameters in the coastal waters of Seri Village which include temperature, salinity, pH and substrate, it shows that, from the results of measurements of sea water temperature taken on transect I, the temperature value range is between 23.6 oC-23.6 oC on the transect. II temperature values range between 29.9 oC-23.8 oC. Transect III has a temperature value range of between 23.9 oC-23.8 oC. Temperature in the sea is an important factor for the life of marine organisms. Water will control the body temperature of organisms (Boyd 2015). (Munarto 2010) which explains that changes in temperature affect the types of organisms that can live and survive in certain water areas, as well as the activity of an organism. The results of measurements regarding salinity carried out using a refractometer on transect I have a salinity value range of between 26o/oo – 32o/oo. On transect II, the salinity value ranges between 32o/oo – 30o/oo, on transect III the salinity value ranges between 30o/oo. Salinity affects production and distribution. Length of life and migration orientation. Salinity is a very important factor that gives organisms the ability to adapt to the environment. Al (2105). Nontji (2002) stated that high and low salinity values in the sea are influenced by several factors, such as water circulation patterns, evaporation, rainfall and river flow. The next factor is pH, the pH value in transect I has a range between 8.1-8.0, in transect II the pH value has a range between 7.8-8.2 and in transect III the pH has a range between 7.8-8, 2. According to Ariska, (2012) added that a low pH value causes a decrease in the amount of dissolved oxygen in a body of water, thus causing the respiratory activity of gastropods to increase and their appetite to decrease. The opposite happens in waters that have a high pH value, which can cause ammonia levels to increase, thereby indirectly endangering organisms in these waters.

The next environmental factor that also influences the coastal waters of Seri Village is dissolved oxygen (DO). The results of dissolved oxygen measurements on transect I ranged between 14.4 -14.3 mg/l. In transect II the dissolved oxygen (DO) value ranged between 10.1-14.0 mg/l and in transect III the dissolved oxygen (DO) value ranged between 10.4-14.0 mg/L. Odum, (1998). Dissolved oxygen (DO) is an important factor for the growth of marine biota, such as gastropods. And the oxygen value required by 48 Gastropod organisms ranges from 1.00-3.00 mg/L. The greater the oxygen content in it, the better it is for the survival of the organisms that inhabit it (Syamsurial, 2011: 31). The high DO value in the waters of the Menaming dam is due to environmental conditions that have not been polluted by the activities of the surrounding population. Based on the results of observations of the substrate on the Seri village beach, there are several types of coral and sandy substrates. The substrate on transect I is the type of rock, coral, sand, coral folds on transect II, the substrate type is Batun Mati, coral, sand, and seagrass moss rocks on Transect III, type III. Black stone substrate, coral, seagrass, sand, patterned stone, alkaline rocks. Substrate type is the main factor that greatly influences the distribution of gastropods. Apart from that, the type of substrate is also related to the availability of nutrients in the sediment.

Based on the results of taking Neritidae species in the coastal waters of Seri Village, 7 types of Neritidae were found with a total of 207 individuals, namely Nerita Squamalata, Nerita Chamaeleon, Nerita Maxima, Nerita Polita, Nerita Polita, Nerita Albicilia, Nerita Planospira, Nerita Patula. Of the nerita types, the one that dominates is Nerita Polita with a total of 158 individuals, while the lowest type is nerita Patula

with a number of 1. The results of calculations of Neritidae Density in Seri Village Beach Waters carried out as a whole from 3 transects found 7 species, 1 family, 1 genus and 207 individuals in the phylum Mollusca. By calculating the density on the coast of Seri Village, the values for each species are as follows: *Nerita squamulata* is 0.001833, *Nerita chamaeleon* is 0.002167, *Nerita maxima* is 0.002167, *Nerita polita* is 0.026333, *Nerita albicilla* is 0, 0015, *Nerita planospira* is 0.000333 and *Nerita patula* is 0.000167 with a total absolute density of 0.0345. in accordance with the density category according to Cox (1967) which explains that 0= no density, 1-10= less density, 10-20= sufficient density and >20= very much density, thus it can be concluded that the Neritidae in the coastal waters of Seri village is that there is no density.

Nerita density shows the number of individuals living in a certain habitat, a certain area and a certain time. *Nerita* found in the coastal waters of Seri Village has a low density value but the water conditions support its presence, the availability of organic material and is supported by the condition of the sandy substrate and the presence of small rocks (dead shells) around the place. The density value is influenced by the optimum habitat conditions for *Nerita* life so that *Nerita* is able to reproduce well. Odum (1998) also explained that a species with a high density indicates that the organism has the ability to occupy a larger space so that it has the ability to develop more. Meanwhile, Carpenter (1988) explained that low species density values are due to the presence of competition or predators, the physical environment and poor water chemistry which can cause differences in density.

CONCLUSION

1. There are 7 types of *Nerita* found in the coastal waters of Seri Village in 1 family and 1 genus, namely *Nerita Squamulata*, *Nerita Chamaeleon*, *Nerita Maxima*, *Nerita Polita*, *Nerita Albicilia*, *Nerita Planospira* and *Nerita Patula*.
2. The density of *Nerita* in the coastal waters of Seri Village has an absolute density value of 0.0345, which indicates that there is no density at that location.

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