



Macrobenthos Community in the Littoral Zone Water Area of Iboih Beach Sabang, Aceh

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Abstract: The aim of this study is to know the macrobenthos community in the littoral zone water area of Iboih beach, Aceh. Sample collection is conducted by using plot size of 1 x 1 meter, destructive sampling and non-destructive sampling methods. The results shows that macrobenthos inventory on Rubiah Island in Sabang, Aceh with destructive sampling methods is amounted to 8 species from 5 families, while Benthos obtained from non-destructive sampling methods is amounted to 8 species from 6 families. Macrobenthos inventory on the water of natural tourism area of Iboih beach Sabang. Diversity index is moderate with $H' = 1.22061$, and non-destructive value $H' = 1.31391$. Includes the category of moderate diversity. In Payau waters with destructive $H' = 1.74816$, nondestructive with a value of $H' = 1.7104$. Has a moderate diversity index. Macroinvertebrate inventory of the Teupin Layeu Mangrove Waters of Sabang City found 27 and 29 species of benthos. Among them (*Meretrik meretrik*) is amounted to 44, (*Anadara cunearca*) is amounted to 36 and many other species. With species diversity $H' = 3, 2114$ indicates a high level of species diversity.

Keywords: Macrobenthos; Littoral zone water; Iboih beach.

I. Introduction

Aceh has a wealth of macrobenthos and macrobenthos aquatic organisms. Some of which have been surveyed include the white sand waters of Lhok Mee Aceh Besar found in various invertebrates, that is Gastropod Class, *Holothuroidea*, Sea urchin (*Diadema, Sp*), *Chiton, sp. Ophiuroide* (Oktavia, R. 2018).

Weh Island or Sabang City in the province of Aceh is one of the marine tourism destinations located at coordinates 95° 14' 11, 39" BT and 05°53' 38, 66" LU with an area of 153 km². In this Weh Island have several other small islands that have biodiversity that has not been explored. Among Rubiah Island, Rondo Island and others.

Iboih Beach is a marine tourism area that stores a lot of natural wealth and diversity of living creatures that live in it. One of the aquatic biota in this beach is benthos. Benthos are organisms that live on the surface or in the basic sediments of a body of water. Benthos are all aquatic organisms that live on the basic substrate of a water, both sessile (attached) and vigil (moving freely).

Based on the place of life, benthos can be divided into *epifauna* and *ifauna*. *Epifauna* is benthos whose life is on the substrate of the water while *infauna* is benthos whose life is embedded in the substrate of the water base. (Barus T., 2004)

The role of benthos in a waters is to be able to recycle the organic material that is found or dissolved in a waters. In addition, benthos plays a role in helping the mineralization process and occupies an important position in the food chain and indicators of pollution of the aquatic environment.

Benthos as a basic aquatic organism that has a relatively fixed habitat. With these characteristics, changes in water quality and the substrate where it lives greatly affect the composition and abundance. The composition and abundance of macro invertebrates depends

on their tolerance for environmental changes. Each community responds to changes in quality and habitat by adjusting to the community structure. (Effendi, 2003).

Benthos has a sensitivity to some pollutants, low mobility, easy to catch and has a long survival. Therefore, the role of benthos in the balance of an aquatic ecosystem can be an indicator of the current ecological conditions in a particular region. (Ajeng, Tri Purnami, et al., 2010). Apart from that, some or all life cycle of benthos is in the bottom of the waters, both sessile, creeping and digging holes. Therefore, the benthos research was carried out with the destructive or destructive method and the habitat without benthos (nondestructive) method. (Borror, 2000).

The main factors that influence the amount of benthos, species diversity, and dominance, among others, are the destruction of natural habitats, chemical pollution, and climate change (Ajeng Tri Purnami, et al., 2010). Biotic factors that influence are producers, which is a food source for benthos animals. The abiotic factors are the physics-chemistry of water which include temperature, current, dissolved oxygen (DO), biological oxygen demand (BOD) and chemistry (COD), as well as nitrogen (N) content, water depth, and basic substrate. (Campbell, K. A, 2003).

II. Research Methods

This study was carried out on Weh Island, Sabang. The sampling was carried out in three different habitats, there are Rubiah Island, natural tourist area waters, and mangrove Teupin Layeu waters. Sampling was carried out in May-June 2018 and identification was continued at the Biology Laboratory of Islamic State University of Ar-Raniry Banda Aceh.

Sample collection was carried out using 1 x 1 meter plots, destructive sampling and non-destructive sampling methods. Benthos with destructive sampling method initially selected observation areas such as the sea littoral area. Observational plots were made with 1 x 1 meter measurement when low tide. Measured pH, salinity, temperature and water depth. Passed down the *ekmand grap* slowly to the bottom of the waters, then released the pendulum. Then slowly lifted, put mud into the filter, then sifted, separated specimens from mud. Animal specimens were put into a sample bottle and given 4% formalin, identified and entered into the observation table. For shallow waters, it is done by scraping or dismantling benthos habitat. Furthermore, benthos is calculated using scratches or by hand directly in the square or that has been made.

Benthos with nondestructive sampling method selected observation areas such as the sea littoral area, made an observation plot with a size of 1 x 1 meter at low tide, measured pH, salinity, temperature and water depth, calculated directly benthos that is in the square or that has been made, then identified and tabulated in the table.

There are three benthos sampling locations on Weh Island Sabang. The determination of the observation station is done by purposive sampling by determining the area identified by the existence of benthos. The distance of each station ranges from 10 meters and the selection of each sampling point based on the depth zone of the waters that is shallow water (± 30 cm), medium (± 60 cm) and deep (± 90 cm).

Unknown sample types are put into sample bottles which contains 70% alcohol for temporary preservation. Observation and identification of benthos were carried out in the Biology Education Study Program Laboratory of FTK Islamic State University of Ar-Raniry Banda Aceh.

Benthos diversity (H') is calculated using the Shannon-Winners Diversity Index formula as follows:

$$H' = -\sum (P_i) (\ln P_i)$$

.....Where $P_i = \frac{n_i}{N}$

The results obtained can then be categorized into 3 categories, namely:

1. If $H' < 1$, the diversity index is categorized as Low.
2. If $H' 1 < H' < 3$, the diversity index is categorized as Medium.
3. If the results of $H' > 3$ then the diversity index is categorized as High (Fachrul, 2006).

III. Discussion

Based on the results of the identification and analysis of the data, the benthos community on Rubiah Island, the waters of the natural tourism area, and the mangrove waters of Teupin Layeu were found as follows:

3.1 Benthos Community on Rubiah Island

The number of species found on the littoral of the Rubiah Islands in the Sukakarya SubSubdistrict of Sabang City is amounted to 16 species of benthos out of 11 families. Types of benthos found in the waters of Rubiah Islands in the Sukakarya SubSubdistrict of Sabang City were obtained by destructive sampling methods of 8 species from 5 families, including *Crassostrea gigas* amounted to 19, *Saccostrea cucullata* amounted to 5, *Crassostrea sp* amounted to 3, *Paltella vulgata* amounted to 3, *Chiton sp.* amounted to 2, *Cerastoderma edule* amounted to 3, *Mytilus edulis* amounted to 9, and *Planaxis sulcatus* amounted to 7.

Whereas Benthos which obtained from non-destructive sampling methods are amount to 8 species from 6 families including *Perna viridis* amounted to 1, *Mytilus viridis* amounted to 2, *Meretrix meretrik* amounted to 11, *Paphia textile* amounted to 3, *Anadara (cunearca)* amounted to 13, *Scylla serrata* amounted to 2, *Cerithidae cingulata* amounted to 8, and *Stramonita haemastoma* amounted to 9. Family and types of benthos found in Rubiah Island in Sukakarya SubSubdistrict, Sabang City as a whole can be seen in Table 1.

Table 1 Families, Species and Diversity Index of Benthos in the Waters of Rubiah Island in Sukakarya SubSubdistrict, Sabang City

No.	Families	Species	Total
1.	Ostreidae	1. <i>Crassostrea gigas</i>	19
	Ostreidae	2. <i>Saccostrea cucullata</i>	5
	Ostreidae	3. <i>Crassostrea sp</i>	3
2.	Mytilidae	4. <i>Perna viridis</i>	1
	Mytilidae	5. <i>Mytilus viridis</i>	2
	Mytilidae	6. <i>Mytilus edulis</i>	9
3.	Veneridae	7. <i>Meretrix meretrik</i>	11
	Veneridae	8. <i>Paphia textile</i>	3
4.	Arcidae	9. <i>Anadara (cunearca)</i>	13
5.	Fortunidae	10. <i>Scylla serrata</i>	2
6.	Potamididae	11. <i>Cerithidae cingulata</i>	8
7.	Patelidae	12. <i>Paltella vulgate</i>	3
8.	Chidondae	13. <i>Chiton sp</i>	2
9.	Muricidae	14. <i>Stramonita haemastoma</i>	9

10. Cardiididae	15. <i>Cerastoderma edule</i>	3
11. Planaxidae	16. <i>Planaxis sulcatus</i>	7
Total		100
Diversity index (H') = $-\sum P_i \ln P_i = -(-2,49655122) = 2,49655122$		

The Shannon Winner diversity index of benthos species in the waters of Rubiah Island, Sukakarya SubSubdistrict, Sabang City is classified as moderate, which is indicated by the benthos diversity index of 2.49655122.



Scylla serrata



Crasostrea sp.



Saccostrea cucullata



Cerastoderma edule



Planaxis sulcatus



Mytilus edulis

3.2 Benthos Community in the Waters of the Natural Tourism Area

Benthos diversity in the Iboih coastal area with destructive sampling method is classified as moderate, with a diversity index value of $H' = 1.22061$ (1.2). The most dominant species is *Parathelphusa sp.* from the *Parathelphusidae* family is amounted to 5 species and the least species found is *Pilsbryoconcha exilis* from the *Parathelphusidae* family which is only 1 species (Table 2). Whereas benthos sampling uses non-destructive sampling method. (Table 3.) found that the dominant species are 9 species of *Mytilus edulis*. The diversity index is classified as moderate with the value $H' = 1.31391$ (1.3).

Inventory uses destructive sampling method in Payau waters, the type of benthos found is from 6 different families. The species that dominate are from the *Arcidae* family with the species *Barbatia sp.* is amounted to 3 species. The diversity index is classified as moderate with a value of $H' = 1.74816$ (1.7) (Table 4).

Inventory uses a non-destructive sampling method in Payau waters in the natural tourism area of Iboih, Sabang (Table 5). That is amounted to 6 families with *predominant* species that are derived from the *Isognomonidae* family with *Isognomon sp.* Is amounted to 4 species. The diversity index is classified as moderate with the value $H' = 1.7104$ (1.7).

Table 2. Benthos Diversity in Waters of Iboih Beach in Destructive Sampling

No	Species	Families	Total	H'
1	<i>Cerithidea cingulata</i>	Potamididae	2	0,32189
2	<i>Pilsbryconcha exilis</i>	Unionidae	1	0,23026
3	<i>Parathelphusa convexa</i>	Parathelphusidae	2	0,32189
4	<i>Parathelphusa</i> sp.	Parathelphusidae	5	0,34657
Total			10	1,22061
Diversity index (H') = $-\sum P_i \ln P_i = -(-1,22061) = 1,22061$				

Table 3. Benthos Diversity in Waters of Iboih Beach in Non-Destructive Sampling

No	Species	Families	Total	H'
1	<i>Littorina</i> sp.	Littorinidae	5	0,32679
2	<i>Cerastoderma edule</i>	Cardiidae	3	0,2599
3	<i>Mytilus edulis</i>	Mytilidae	9	0,36781
4	<i>Planaxis sulcatus</i>	Planaxidae	7	0,35937
Total			24	1,31391
Diversity index (H') = $-\sum P_i \ln P_i = -(-1,31391) = 1,31391$				

Table 4. Benthos Diversity in Waters of Payau in the Natural Tourism Area of Iboih in Destructive Sampling

No	Species	Families	Total	H'
1	<i>Barbatia</i> sp.	Arcidae	3	0,34657
2	<i>Natica</i> sp.	Naticidae	2	0,29863
3	<i>Nerita</i> sp.	Neritidae	2	0,20708
4	<i>Scylla</i> sp.	Portunidae	1	0,29863
5	<i>Monodonta</i> sp.	Trochidae	2	0,29863
6	<i>Isognomon</i> sp.	Isognomonidae	2	0,29863
Total			12	1,74816
Diversity index (H') = $-\sum(P_i)(\ln P_i) = -(-1,74816) = 1,74816$				

Table 5. Benthos Diversity in Waters of Payau in the Natural Tourism Area of Iboih in Non-Destructive Sampling

No	Species	Families	Total	H'
1	<i>Nerita</i> sp.	Neritidae	1	0,1885
2	<i>Telescopium telescopium</i>	Potamididae	2	0,2779
3	<i>Monodonta</i> sp.	Trochidae	3	0,3301
4	<i>Scylla</i> sp.	Portunidae	2	0,2779
5	<i>Littorina scabra</i>	Littorinidae	2	0,2779
6	<i>Isognomon</i> sp.	Isognomonidae	4	0,3579
Total			12	1,7104
Diversity index (H') = $-\sum(P_i)(\ln P_i) = -(-1,7104) = 1,7104$				

3.3 Benthos Community in the Teupin Layeu Mangrove Waters

The results of inventarisation were obtained by 42 benthos species in the Teupin Layeu area of Sabang City by using destructive sampling methods and 42 types of benthos by using non destructive sampling methods.

Table 6. Benthos Diversity of Destructive Sampling in the Teupin Layeu Mangrove Waters of Sabang City

Po-int	No.	Phylum	Class	Ordo	Families	Genus	Species	Σ	Pi (NI/n)	Ln. Pi	Pi.Ln.PI	H'
1	1	Mollusca	Bivalvia	Poeciloclerina	Isognomonidae	Isognomon	Isognomon ephippium	10	0,05128	-2,9705	-0,1523308	-0,1523308
	2	Mollusca	Bivalvia	Haplo-scrindo	Margaritiferidae	Margaritifera	Margaritifera margaritifera	6	0,03077	-3,4812	-0,1071142	-0,1071142
	3	Mollusca	Bivalvia	Hipposngiadae	Corbiludae	Polymesoda	Polymesoda expansa	1	0,00513	-5,2726	-0,0270392	-0,0270392
2	1	Porifera	Demospongiae	Poeciloclerina	Microcionidae	<i>Microciona</i>	<i>Microciona sp</i>	17	0,08718	-243978	-21269,877	-21269,877
	2	Porifera	Demospongiae	Haplo-scrindo	Chalinidae	<i>Haliclona</i>	<i>Haliclona oculata</i>	6	0,03077	-3,4812	-0,1071142	-0,1071142
	3	Porifera	Demospongiae	Keratosia	Hipposngiadae	Hipposngiae	<i>Hippospongia sp</i>	13	0,06667	-2,708	-0,1805333	-0,1805333
	4	Anidara	Scleractinia	Pocilloporidae	Pocilloporidae	Pocillopora	<i>Pocillopora damicornis</i>	2	0,01026	-4,5795	-0,0469692	-0,0469692
3	1	Mollusca	Bivalvia	Haplo-scrindo	Margaritiferidae	Margaritifera	Margaritifera margaritifera	3	0,01538	-4,1747	-0,0642258	-0,0642258
	2	Porifera	Gastropoda	Neotaenioqlossa	Hydrobiidae	<i>Pyrgulopsis</i>	<i>Pyrgulopsis nevadensis</i>	2	0,01026	-4,5795	-0,0469692	-0,0469692
4	1	Mollusca	Bivalvia	Poeciloclerina	Isognomonidae	Isognomon	Isognomon ephippium	10	0,05128	-2,9705	-0,1523308	-0,1523308
	2	Mollusca	Bivalvia	Haplo-scrindo	Margaritiferidae	Margaritifera	Margaritifera margaritifera	6	0,03077	-3,4812	-0,1071142	-0,1071142
	3	Mollusca	Bivalvia	Hipposngiadae	Corbiludae	Polymesoda	Polymesoda expansa	1	0,00513	-5,2726	-0,0270392	-0,0270392
5	1	Porifera	Gastropoda	Caenogastropoda	Thiaridae	<i>Tarebia</i>	<i>Pyrgulopsis</i>	5	0,02564	-3,6636	-0,0939385	-0,0939385
	2	Porifera	Gastropoda	Caenogastropoda	Hydrobiidae	<i>Tryonia</i>	<i>Tryonia clathrata</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392
	3	Porifera	Gastropoda	Caenogastropoda	Lymnaeinae	<i>Lymneas</i>	<i>Lymneas stagnalis</i>	2	0,01026	-4,5795	-0,0469692	-0,0469692
	4	Porifera	Gastropoda	Neotaenioqlossa	Hydrobiidae	<i>Pyrgulopsis</i>	<i>Pyrgulopsis nevadensis</i>	5	0,02564	-3,6636	-0,0939385	-0,0939385
6	1	Mollusca	Gastropoda	Megastropoda	Littorinidae	<i>Littoraria</i>	<i>Littoraria scabra</i>	18	0,09231	-2,3826	-0,2199323	-0,2199323
	2	Mollusca	Gastropoda		Thiaridae	<i>Thiara</i>	<i>Thiara cancellata</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392
	3	Mollusca	Gastropoda	Eupulmonata	Ellobidae	<i>Ellobium</i>	<i>Ellobium aurimidae</i>	3	0,01538	-4,1747	-0,0642258	-0,0642258
	4	Atropoda	Crustaceae	Decapoda	Portunidae	<i>Scylla</i>	<i>Scylla serrata</i>	2	0,01026	-4,5795	-0,0469692	-0,0469692
	5	Mollusca	Gastropoda	Caenogastropoda	Potamididae	<i>Terebralia</i>	<i>Terebralia sulcata</i>	2	0,01026	-4,5795	-0,0469692	-0,0469692
7	1	Mollusca	Bivalvia	Pteriomorpha	Arcoidae	<i>Anadara</i>	<i>Anadara granosa</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392
	2	Mollusca	Gastropoda	Vetigastropoda	Ovinotidae	<i>Ovinotis</i>	<i>Ovinotis ovina</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392
	3	Mollusca	Gastropoda	Neotaenioqlossa	Hydrobiidae	<i>Pyrgulopsis</i>	<i>Pyrgulopsis nevadensis</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392
	4	Mollusca	Gastropoda	Caenogastropoda	Thiaridae	<i>Tarebia</i>	<i>Tarebia granifera</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392
	5	Mollusca	Gastropoda	Neritimorpha	Neritidae	<i>Neritina</i>	<i>Neritina natalensis</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392
	6	Crustacea	Malacostraca	Decapoda	Portunidae	<i>Scylla</i>	<i>Scylla serrata</i>	1	0,00513	-5,2726	-0,0270392	-0,0270392

8	1	Mollusca	Gastropoda	Vetigastropoda	Ovinotidae	Ovinotis	Ovinotis ovina	3	0,01538	-4,1747	-0,0642258	-0,0642258
	2	Molusca	Bivalvia	Hippოსngiadae	Corbiludae	Polymesoda	Polymesoda expansa	1	0,00513	-5,2726	-0,0270392	-0,0270392
	3	Porifera	Gastropoda	Caenogastropoda	Lymnaeinae	Lymneas	Lymneas stagnalis	1	0,00513	-5,2726	-0,0270392	-0,0270392
	4	Mollusca	Gastropoda	Caenogastropoda	Potamididae	Terebralia	Terebralia sulcata	4	0,02051	-3,8868	-0,0797301	-0,0797301
	5	Porifera	Gastropoda	Neotaenioqlossa	Hydrobiidae	Pyrgulopsis	Pyrgulopsis nevadensis	6	0,03077	-3,4812	-0,1071142	-0,1071142
	6	Mollusca	Bivalvia	Veneroidea	veneridae	meretrix	Meretrix meretrik	20	0,10256	-2,2773	-0,2335692	-0,2335692
9	1	Mollusca	Bivalvia	Arcida	Arcidae	Arcoidea	Barbatia sp.	3	0,01538	-4,1747	-0,0642258	-0,0642258
	2	Mollusca	Gastropoda	Naticoidea	Naticidae	Arcoidea	Natica sp.	2	0,01026	-4,5795	-0,0469692	-0,0469692
	3	Mollusca	Gastropoda	Neritimorpha	Neritoidea	Neritimorpha	Nerita sp.	2	0,01026	-4,5795	-0,0469692	-0,0469692
	4	Arthropoda	Crustaceae	Decapoda	Portunidae	Decapoda	Scylla sp.	1	0,00513	-5,2726	-0,0270392	-0,0270392
	5	Mollusca	Gastropoda	Trochida	Trochidae	Arcoidea	Monodonta sp.	2	0,01026	-4,5795	-0,0469692	-0,0469692
	6	Mollusca	Bivalvia	Pteriida	Isogonomidae	Pterioidea	Isognomon sp.	2	0,01026	-4,5795	-0,0469692	-0,0469692
10	1	Arthropoda	Malacostraca	Dacapoda	fortunidae	Scylla	Scylla serrata	2	0,01026	-4,5795	-0,0469692	-0,0469692
	2	Mollusca	Bivalvia	Pteriomorpha	Arcidae	Anadara	Anadara(cume arca)	13	0,06667	-2,708	-0,1805333	-0,1805333
	3	Mollusca	Bivalvia	Veneroidea	veneridae	Meretrix	Meretrix meretrik	11	0,05641	-2,8751	-0,1621851	-0,1621851
Total								195	1	-244153	-21272,933	-21272,933
Diversity index (H') = $-\sum P_i \ln P_i = -(-21272,93251) = 21272,93251$												

Table 7 Benthos Diversity of Non-Destructive Sampling in the Teupin Layeu Mangrove Waters of Sabang City

Po-int	No	Phylum	Class	Ordo	Families	Genus	Species	Σ	Pi (NI/n)	Ln. Pi	Pi.Ln.PI	H'
1	1	Arthropoda	Malacostraca	Decapoda	Portunidae	Scylla	Scylla olivacea	1	0,00885	-5	-0,041835	0,0418348
	2	Mollusca	Gastropoda	Mesogastropoda	Littorinidae	Littoraria	Littoraria scabra	2	0,0177	-4,034	-0,071402	0,0714025
	3	Mollusca	Gastropoda	Cycloneritida	Neritidae	Nerita	Nerita lineata	2	0,0177	-4,034	-0,071402	0,0714025
2	1	Mollusca	Gastropoda	Neritimorpha	Neritoidea	Neritimorpha	Nerita sp.	1	0,00885	-5	-0,041835	0,0418348
	2	Mollusca	Gastropoda	Potamididae	Caenogastropoda	Telescopium	Telescopium telescopium	2	0,0177	-4,034	-0,071402	0,0714025
	3	Mollusca	Gastropoda	Neritimorpha	Neritoidea	Neritimorpha	Nerita sp.	3	0,02655	-3,629	-0,096339	0,0963388
	4	Arthropoda	Crustaceae	Decapoda	Portunidae	Decapoda	Scylla sp.	2	0,0177	-4,034	-0,071402	0,0714025
	5	Mollusca	Gastropoda	Littorinidae	Sorbeoconcha	Littorina	Littorina scabra	2	0,0177	-4,034	-0,071402	0,0714025
	6	Mollusca	Bivalvia	Pteriida	Isogonomidae	Pterioidea	Isognomon sp.	4	0,0354	-3,341	-0,118269	0,1182687
3	1	Mollusca	Gastropoda	Vetigastropoda	Ovinotidae	Haliotis	Haliotis ovina	2	0,0177	-4,034	-0,071402	0,0714025
	2	Mollusca	Gastropoda	Caenogastropoda	Cerithidae	Rhinoclavis	Rhinoclavis sinensis	2	0,0177	-4,034	-0,071402	0,0714025
	3	Mollusca	Gastropoda	Neritimorpha	Neritidae	Neritina	Neritina natalensis	3	0,02655	-3,629	-0,096339	0,0963388
		Molusca	Gastropoda	Mesogastropoda	Littorinidae	Littoraria	Littoraria scabra	1	0,00885	-5	-0,041835	0,0418348
4	1	Arthropoda	Malacostraca	Decapoda	Portunidae	Scylla	Scylla olivacea	1	0,00885	-5	-0,041835	0,0418348
	2	Mollusca	Gastropoda	Mesogastropoda	Littorinidae	Littoraria	Littoraria scabra	2	0,0177	-4,034	-0,071402	0,0714025

	3	Mollusca	Gastropoda	Cycloneritida	Neritidae	<i>Nerita</i>	<i>Nerita lineata</i>	2	0,0177	-4,034	-0,071402	0,0714025
5	1	Mollusca	Bivalvia	Pteriormorphia	Arcoidea	<i>Anadara</i>	<i>Anadara granosa</i>	6	0,0531	-2,936	-0,155874	0,1558742
	2	Mollusca	Gastropoda	Caenogastropoda	Thiaridae	<i>Tarebia</i>	<i>Tarebia granifera</i>	1	0,00885	-5	-0,041835	0,0418348
	3	Mollusca	Gastropoda	Vetigastropoda	Ovinoiidae	<i>Haliotis</i>	<i>Haliotis ovina</i>	1	0,00885	-5	-0,041835	0,0418348
	4	Mollusca	Gastropoda	Caenogastropoda	Hydrobiidae	<i>Tryonia</i>	<i>Tryonia clathrata</i>	1	0,00885	-5	-0,041835	0,0418348
6	1	Mollusca	Gastropoda	Caenogastropoda	Potamididae	<i>Terebralia</i>	<i>Terebralia sulcata</i>	1	0,00885	-5	-0,041835	0,0418348
	2	Mollusca	Gastropoda	Megastropoda	Littorinidae	<i>Littoraria</i>	<i>Littoraria scabra</i>	5	0,04425	-3,118	-0,13796	0,1379597
	3	Mollusca	Gastropoda		Thiaridae	<i>Thiara</i>	<i>Thiara cancellata</i>	1	0,00885	-5	-0,041835	0,0418348
	4	Mollusca	Gastropoda	Littorinimorpba	Littorinidae	<i>Littoraria</i>	<i>Littoraria angulifera</i>	1	0,00885	-5	-0,041835	0,0418348
	5	Mollusca	Gastropoda	Caenogastropoda	Cerithiidae	<i>Rhinoclavis</i>	<i>Rhinoclavis sinensis</i>	1	0,00885	-5	-0,041835	0,0418348
	6	Mollusca	Gastropoda		Ellobiidae	<i>Cassidula</i>	<i>Cassidula aurisfelis</i>	1	0,00885	-5	-0,041835	0,0418348
7	1	Mollusca	Bivalvia	Pteriormorphia	Arcoidea	<i>Anadara</i>	<i>Anadara granosa</i>	1	0,00885	-5	-0,041835	0,0418348
	2	Mollusca	Gastropoda	Vetigastropoda	Ovinoiidae	<i>Ovinoiis</i>	<i>Ovinoiis ovina</i>	1	0,00885	-5	-0,041835	0,0418348
	3	Mollusca	Gastropoda	Neotaenioqlossa	Hydrobiidae	<i>Prygulopsis</i>	<i>Prygulopsis nevadensis</i>	1	0,00885	-5	-0,041835	0,0418348
	4	Mollusca	Gastropoda	Caenogastropoda	Thiaridae	<i>Tarebia</i>	<i>Tarebia granifera</i>	1	0,00885	-5	-0,041835	0,0418348
	5	Mollusca	Gastropoda	Neritimorpha	Neritidae	<i>Neritina</i>	<i>Neritina natalensis</i>	1	0,00885	-5	-0,041835	0,0418348
8	1	Mollusca	Bivalvia	Mytiloidea	Mytilidae	<i>Mytilus</i>	<i>Mytilus edulis</i>	2	0,0177	-4,034	-0,071402	0,0714025
9	2	Mollusca	Gastropoda	Neritimorpha	Neritoidea	<i>Neritimorpha</i>	<i>Nerita sp.</i>	1	0,00885	-5	-0,041835	0,0418348
	3	Mollusca	Gastropoda	Potamididae	Caeno-gastropoda	<i>Telescopium</i>	<i>Telescopium telescopium</i>	2	0,0177	-4,034	-0,071402	0,0714025
	4	Mollusca	Gastropoda	Neritimorpha	Neritoidea	<i>Neritimorpha</i>	<i>Nerita sp.</i>	3	0,02655	-3,629	-0,096339	0,0963388
	5	Arthropoda	Crustaceae	Decapoda	Portunidae	<i>Decapoda</i>	<i>Scylla sp.</i>	2	0,0177	-4,034	-0,071402	0,0714025
	6	Mollusca	Gastropoda	Littorinidae	Sorbeoconcha	<i>Littorina</i>	<i>Littorina scabra</i>	2	0,0177	-4,034	-0,071402	0,0714025
	7	Mollusca	Bivalvia	Pteriida	Isognomonidae	<i>Pterioidea</i>	<i>Isognomon sp.</i>	4	0,0354	-3,341	-0,118269	0,1182687
	10	1	Mollusca	Bivalvia	Pteriormorpha	arcidae	<i>anadara</i>	<i>Anadara(cunearca)</i>	23	0,20354	-1,592	-0,324013
	2	Mollusca	Bivalvia	Veneroidea	veneridae	<i>meretrix</i>	<i>Meretrix meretrik</i>	13	0,11504	-2,162	-0,24878	0,2487797
	3	Mollusca	Bivalvia	Anysomyaria	mytilidae	<i>perna</i>	<i>Perna viridis</i>	5	0,04425	-3,118	-0,13796	0,1379597
Total								1131		-168	-3,211398	3,2114
Diversity index $(H') = -\sum P_i \ln P_i = -(-3,2114) = 3,2114$												

Benthos diversity found in the waters of the Teupin Layeu mangrove, Sukakarya Subdistrict, Sabang City is 27 species using destructive sampling techniques and 29 species (Table 6).

Furthermore, using non-destructive sampling techniques with a total of 113 and 195 (Table 7). In general, the benthos species that dominate can be seen from the level of presence compared to other species. Benthos species that dominate from 10 observation points in the Teupin Layeu mangrove waters are (*Meretrik meretrik*) amounted to 44, and (*Anadara cunearca*) and amounted to 36.

IV. Conclusion

Macrobenthos inventory on Rubiah Island in Sabang, Aceh with destructive sampling methods is amounted to 8 species from 5 families, while Benthos obtained from non-

destructive sampling methods is amounted to 8 species from 6 families. The number of benthos species found on the Rubiah Island in the Sukakarya Subdistrict of Sabang City is 16 benthos species, with $H' = 2.49655122$ indicating a moderate level of species diversity.

Macrobenthos inventory on the water of natural tourism area of Iboih beach Sabang. Diversity index is moderate with $H' = 1.22061$, and non-destructive value $H' = 1.31391$. Includes the category of moderate diversity.

In Payau waters with destructive $H' = 1.74816$, nondestructive with a value of $H' = 1.7104$. Has a moderate diversity index.

Macroinvertebrate inventory of the Teupin Layeu Mangrove Waters of Sabang City found 27 and 29 species of benthos. Among them (*Meretrik meretrik*) is amounted to 44, (*Anadara cunearca*) is amounted to 36 and many other species. With species diversity $H' = 3, 2114$ indicates a high level of species diversity.

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