



COMPOSITION OF MEGABENTHOS IN CORAL REEF ECOSYSTEM, PASUMPAHAN ISLAND, WEST SUMATERA

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Article Received on 21/05/2019

Article Revised on 11/06/2019

Article Accepted on 01/07/2019

ABSTRACT

The purpose of this study is to determine density of megabenthos on coral reef in Pasumpahan Island. The observation has been carried out using a method of 5x5 m squared plot at a depth of 2-5 m. The data obtained were analyzed to get the density value. The megabenthos species were: *Tridacna* spp. (giant clams), *Diadema setosum* (sea urchin), *Trochus* spp. (sea snails) and *Acanthaster planci* (crown of thorns starfish). The highest density of megabenthos was found on *Tridacna* spp. (0.77 ind / m²). Despite the existence of *Tridacna* spp. only found in six sites (lower compared to *D. setosum* that was found in eight sites) of a total of nine observation sites. *Tridacna* spp. was found a lot, because it was dominated by rocky corals from the life form coral massive. This coral life form is useful for *Tridacna* spp. as a place of life by attaching and punching the coral.

KEYWORDS: Coral Reef, Megabenthos, Pasumpahan Island.

INTRODUCTION

Pasumpahan Island administratively exists in Bungus Teluk Kabung District, Padang City. The island is hilly and has white sand with several type of tree such as coconuts, shrubs and grass. The island is also an international tourist destination that has dock facilities, cottages and island ring roads.^[3] Tanto^[13] reported that marine ecotourism is quite potential to be developed on Pasumpahan Island, including beach tourism, diving and snorkeling.

The huge potential as a location for marine tourism on this island is feared to be a threat to the surrounding marine resources, especially its coral reef ecosystem. It was recorded in 2015 the percentage of live coral cover on this island was 25.5%.^[13] Activities of tourists and the surrounding community was considered to be the cause of the damage to coral reefs on Pasumpahan Island.

Damage to the coral reef ecosystem on Pasumpahan Island, directly or indirectly, will cause disruption to food chain. One of the disturbed biota is from the megabenthos group. Some of the types of megabenthos that live in coral reef ecosystems are sea cucumber, giant clams, lobsters, sea snails, crowns of thorns starfish, sea urchin and blue sea star^[12]. Certainly, the damage to coral reefs will affect the type and total of megabenthos in the coral reef ecosystem on Pasumpahan Island.

MATERIALS AND METHODS

The research was conducted using survey methods. The megabenthos observation was carried out on Pasumpahan Island in September 2018 using SCUBA. Depth is in the range of 2 to 5 m. Determination of observed stations was using a purposive sampling method based on the presence of coral reefs. The stations were divided into three groups, namely: sites 1, 2, 3 and 4 (Southwest), sites 5 and 6 (Northeast) and sites 7, 8 and 9 (East) (Figure 1). Observation of the type and total of megabenthos that interact with coral reefs was using the 5x5 m quadratic method.

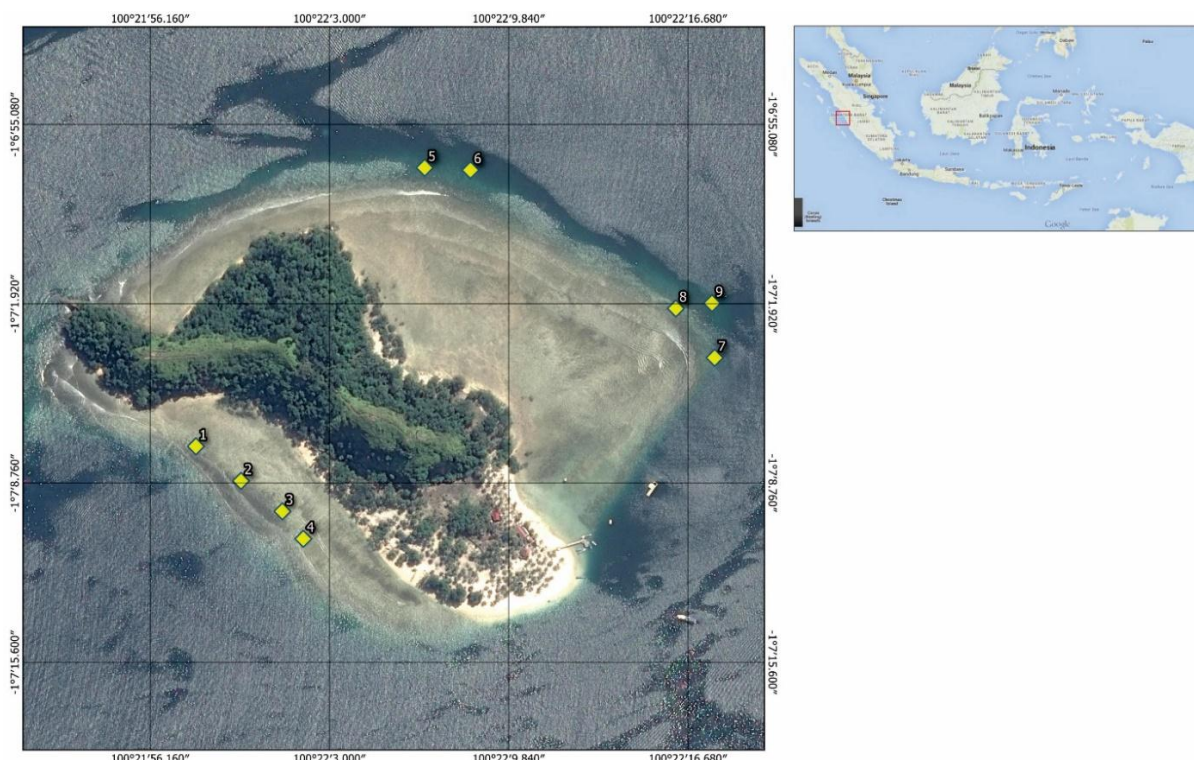


Figure 1: Map of Pasumpahan Island showing dive sites.

RESULTS AND DISCUSSION

Species and total of megabenthos found in nine study location sites can be seen in Table 1. Table 1 shows the total of megabenthos individuals found on Pasumpahan Island was 218 individuals from four megabenthos:

Tridacna spp. (giant clams) of 174 individuals, *Diadema setosum* (sea urchin) of 37 individuals, *Trochus* spp. (sea snails) of 6 individuals and *Acanthaster planci* (crown of thorns starfish) of 1 individuals.

Table 1: Species, total and density of megabenthos on Pasumpahan Island.

Sites Number	<i>Tridacna</i> spp. (giant clams)		<i>D. setosum</i> (sea urchin)		<i>Trochus</i> spp. (sea snails)		<i>A. planci</i> (crown of thorns starfish)	
	Total	Density (ind/m ²)	Total	Density (ind/m ²)	Total	Density (ind/m ²)	Total	Density (ind/m ²)
1	-	-	10	0,4	-	-	1	0,04
2	10	0,4	4	0,16	1	0,04	-	-
3	52	2,08	4	0,16	-	-	-	-
4	17	0,68	3	0,12	-	-	-	-
5	-	-	2	0,08	3	0,12	-	-
6	-	-	-	-	2	0,08	-	-
7	27	1,08	5	0,2	-	-	-	-
8	26	1,04	1	0,04	-	-	-	-
9	42	1,68	8	0,32	-	-	-	-
Total	174	6,96	37	1,48	6	0,24	1	0,04
Average	19,33	0,77	4,11	0,16	0,67	0,027	0,11	0,004

Description: (-): not found

Tridacna spp. has the highest density value on Pasumpahan Island which is equal to 0.77 ind/m². The density of *Tridacna* spp. on Pasumpahan Island was high because this species generally lives on massive reefs which also have many presences. *Tridacna* spp. on this island lives in coral massive coral rock by punching it.

However, the existence of this type of megabenthos does not interfere with the life of the reef which it inhabits. It can be seen from the absence of death on the reef inhabited by *Tridacna* spp. This type of megabenthos is an organism capable of increasing the heterogeneity of coral reefs, they act as a store of zooxanthellae

(*Symbiodinium* spp.) *Tridacna* spp. also have the potential to counteract eutrophication through filtration of water. Abundant population in *Tridacna* spp. will produce a number of calcium carbonates that are beneficial to coral reefs.^[8]

Furthermore, the megabenthos found in Pasumpahan Island is *D. setosum* of 37 individuals with an average density value of 0.16 ind / m². *D. setosum* obtained at the studied site is generally below or colonized by coral rock. *D. setosum* prefers habitat types such as dead corals and live corals that have characteristics of hard and dense substrate with a simple form.^[9] *D. setosum* is commonly found around coral reefs and rocky habitats that are shallow at depths of about 1 to 6 m, this type hides in crevices during the day and forages at night which are not far from hiding^[14]. But the existence of Echinoidea is a negative thing for coral reefs, these animals play a role as bioerosi and eat algae in corals. Echinoidea is able to degrade most of the hard substrate on the reef gradually until coral degradation and algae cover decreased.^[2]

The high density of *D. setosum* on Pasumpahan Island shows that the condition of coral reefs is poor at this location. The abundance of sea urchins in a location is an indicator that the location is in high environmental pressure and has a low quality coral reef ecosystem. In locations with relatively low environmental pressures or protected environments, abundance of sea urchins will also be low.^[10]

The value of the density of *Trochus* spp. on Pasumpahan Island is also low. The average density value of *Trochus* spp. is 0.027 ind/m². Only found in three sites with a total of six individuals. Low coral cover condition on Pasumpahan Island does not support *Trochus* spp. to be able to live and breed, so the density is low. *Trochus* spp. usually live in many rocky waters with micro algae as food.^[5] The growth rate of the *Trochus* spp population reached 191-401 ind/ha within 24 months in the Banda Naira Islands Waters, Central Maluku Regency^[11] even in Tubbataha Reefs Natural Park, Palawan, Philippines, density of *Trochus* spp. very high ranges from 3000-11,000 ind/ha recorded.^[4]

A. planci is one of the coral predators, which feed on living coral tissue so it can damage coral colonies.^[11] *A. planci* is rarely found on Pasumpahan Island, which is only one individual with an average density value of 0.004 ind/m². This low existence is certainly not a threat to the coral reef ecosystem on Pasumpahan Island. It was proved by no signs of coral death caused by *A. planci* in the observation plot was found. Based on research conducted by Mauliza,^[6] that there is a positive correlation between the density of *A. planci* with dead coral cover, the higher the density of *A. planci*, the higher the dead coral cover. In addition, *A. planci* in the location of this study is considered to be related to the active period of the animal. *A. planci* is relatively more common at night because it is one of the nocturnal

animals^[7] while observations in this study were carried out in the morning to evening.

CONCLUSION

The megabenthos species found in the coral reef ecosystem on Pasumpahan Island consist of, *Tridacna* spp. (giant clams), *Diadema setosum* (sea urchin), *Trochus* spp. (sea snails) and *Acanthaster planci* (Crown of thorns starfish). The highest density is in the type of *Tridacna* spp. (0.77 ind / m²).

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