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BIODIVERSITY OF MOLLUSKS AT ELA-ELA BEACH, SEKOTONG LOMBOK BARAT INDONESIA

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ABSTRACT

Ela-ela beach has wide seagrass ecosystem with sandy substrate. Sea grass is a habitat of various invertebrates including mollusks. Some mollusks live by burrowing in substrate and attaching to seagrass leaves. A study of mollusks diversity of Ela-ela Beach, Sekotong Lombok Barat regency NTB was conducted on July 2012. The objective of this study was to estimate the abundance and diversity of mollusks. Parallel quadrate transect was applied as the sampling methods. Ninety two individuals were collected and identified, consisting of Gastropods (29 species), Bivalves (6 species). The most abundant species in this studied area were *Trachycardium rugosum* (18 individuals) and *Pyrene scripta* (17 individuals). The Diversity Index (H') was 2.99, the Pielou Index (J) was 0.84, and the Margalef Index (d) was 17.31. Based on Odum (1994), the Diversity Index is moderate.

Keywords: Mollusk, diversity, Ela-ela

INTRODUCTION

Indonesia is an archipelagic country which has a large water area with shorelines that can reach 81.719 km in length. It is actually a united, large, and complex coastal ecosystems which are divided into mangrove, sea grass, and coral reef ecosystems (Sukmara & Crawford, 2002). All of them have physical interaction, soluble organic matters, particle organic matters, and fauna migrations which have invaluable meaning for aquatic life fertility, so it can support life for aquatic biota which associate within (Pramudji, 2004). Hence, it's possible that we have a biodiversity of abundant marine flora and fauna. One of them is Mollusks. Salvat (1967) said that Indonesia has a big diversity of Mollusks in Indo-Pasific area.

In this situation, seagrass beds have important role in composing marine ecosystem. They are vegetation from a group of Monocotyledonae (Erftemeijer, 1993) and also have roles in preventing abrasion and sediment stabilizer. A beach with seagrass beds which is still in good condition tends to have a clear, calm water and are protected from abrasion (Azkab, 1999). Ecologically, seagrass beds have a role as a main producer in food chains. They also have role in protecting, breeding, nursing, providing foods and shelter for various organisms, either invertebrates or vertebrates which some of them have commercial values, such as juvenile or mature crustaceans, polychaetas, echinoderms, mollusks, and fish (Aswandy, 1999; Coles *et al.*, 1993.; Suharti *et al.*, 1999; Pratiwi *et al.,* 1997). One of the groups of fauna which are commonly found in seagrass beds are Mollusks, either living as epifauna or infauna, due to their wide distribution. In the food chains, Epifauna Mollusks are component using epiphytes biomass on the leaves of seagrass. While infauna Mollusks become component using liiter on the sediment surfaces (Tomascik *et al.,* 1997).

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Ela-ela Beach located between 88°44'06.60'' LS 115°57'59.02''BT has seagrass beds with substrates from soft sands, rough ones, and mud which is suitable for Mollusk life. That makes it possible for a huge diversity and abundancy of various Mollusks. Of course, the abundancy and diversity of marine organisms such as them in the sea grass beds have a relation with the high primary productivity in seagrass beds (Barnes et al., 1999). Therefore, the goal of this research is to study the diversity, evenness, and dominancy of various Mollusks in seagrass ecosystem of Ela-ela beach. Thus, this research data is expected to give us additional informations about various Mollusks presence in that ecosystem as an effort to keep sustainable utilization and preservation of Indonesian marine organisms.

MATERIALS AND METHODS

The research was conducted in Juli, 2012 at seagrass beds area of Ela-ela Beach, Sekotong, Lombok Barat (88°44'06.60'' LS 115°57'59.02''BT). The sampling was done by using seagrass net which was able to determine Mollusks and seagrass distribution simultaneously.

Mollusks samples are taken from quadratic plot put on the 3 transect lines, each with 50 m in length, paralelly with shoreline. The distance among transects is determined by the longest distance of seagrass growth from the shore. The pictures of the obtained samples are taken, then they are preserved by using $MgCl_2$ 73% (relaxation), alcohol 96% (fixation), and finally alcohol 70% (preservation). Mollusks samples identification was conducted by using literatures such as The Living Marine Resources of The Western Central Pacific Volume 2 (1998) book, Choncology, and Manual of Conchology book.

Several characteristics of the community are the diversity and abundancy of Mollusks species which are able to be determined by using Margalef index (D), Pielou index (J), and Shannon-Wiener index (H) as follows:

$$\text{Margalef Index (D)} = \frac{S-1}{\log N}$$

$$\text{Shannon-Wiener Index (H')} = -\Sigma(ni/N) \ln (ni/N)$$

$$\text{Pielou Index (J)} = \frac{H}{\log S}$$

Annotational :
S = Total number of species
N = Total number of observed individual
ni = The number of I individual

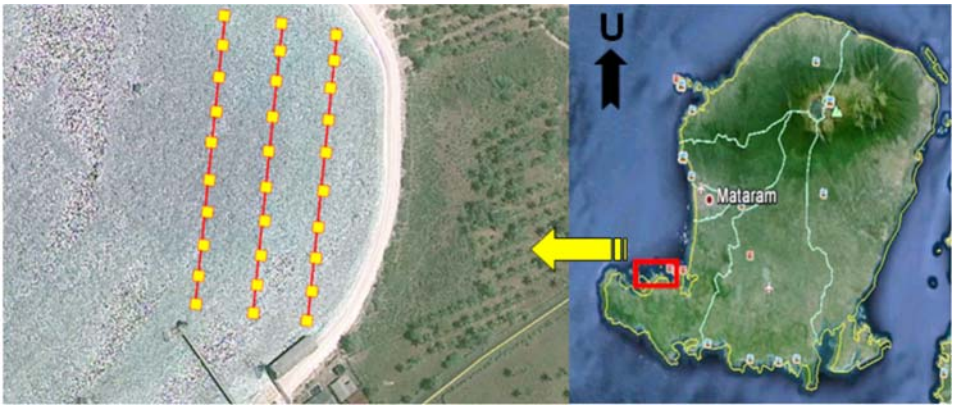

Figure 1. Map of Mollusks research in Ela-ela Beach, Sekotong Lombok Barat Indonesia

RESULTS AND DISCUSSION

The overall result of the research conducted in Ela-ela Beach, Sekotong, Lombok Barat shows that 92 individual Mollusks were found. The entire Mollusks obtained consisted of 35 species which were divided into 2 classes, they were 29 species from Class Gastropoda, and 6 ones from Class Bivalvia. The ratio of individual number for each Mollusks species found is served in figure 2. Gastropod was dominated by the family Columbellidae with the individual number dominated by *Pyrene scripta*, which was 31.2% (17 individuals). Then, class Bivalvia was dominated by family Cardiidae, with the individual number dominated by *Trachycardium rugosum*, which were 31,9% (18 individuals).

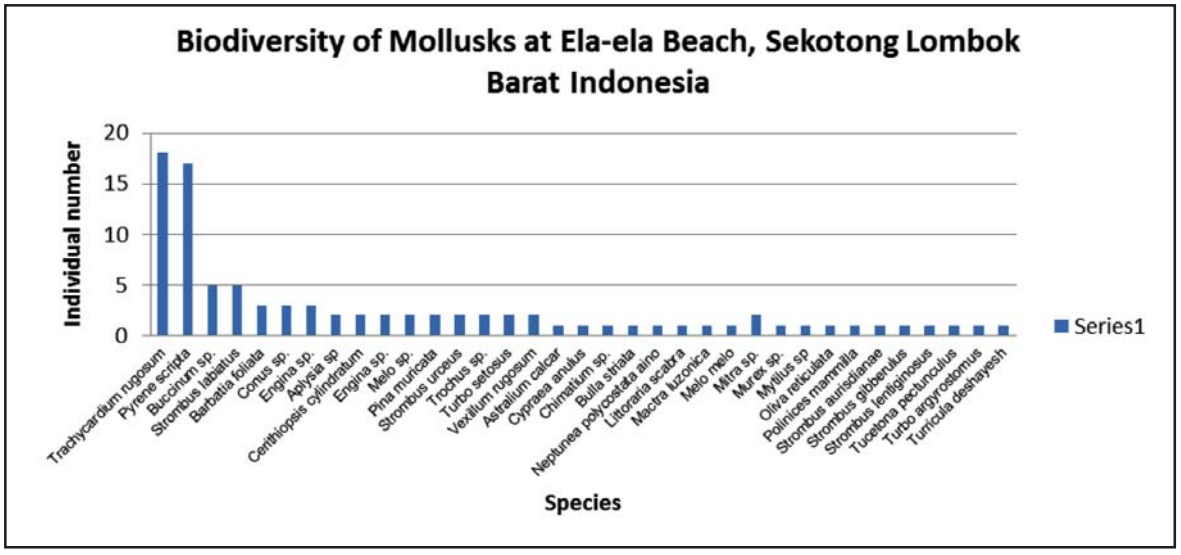

Figure 2. Histogram graph comparing the number of mollusks species in Ela-ela Beach.

The data shows that the number of species and individuals of Gastropod are many more than Bivalvia. If we relate it with the available substrate, then Mollusks species which inhabit a water has positive correlation with its substrate. Then, just like the nature of Bivalvia, members of Bivalvia prefers a habitat with relatively soft substrate, since it is related with feeding behavior that most Bivalvia work as filter feeder. This habit happens when the texture of the substrate is soft, such as muddy one. In a rough one, such as sand, gravel, or rougher one, these kinds of substrate will make them harder to filter the foods. While in

gastropoda, the feeding behavior is various, they can be grazer, deposit feeder, polychaeta feeder, scavenger, bivalvia feeder, gastropod or gastropod feeder. Thus, in every level of substrate, it is easier to find Gastropods. The difference of substrate level determines Gastropod dwelling (Susetiono, 2005). That is the reason why Gastropods were easily found.

Table 1. Characteristics of mollusk community in Ela-ela Beach.

NO	PARAMETER	VALUE
1	Total number of individu	92
2	Total number of species	35
3	Diversity index (H')	2.99
4	Evenness index (J)	0.84
5	Richness index (D)	17.31

Diversity index (H'), evenness index (J), and richness index (D) of Mollusks can be seen in table 1. The value of diversity index (H') is 2.99. According to Odum (1994), if the range value of H' is 2.302 to 6.907, then the species diversity level will be categorized as moderate. Thus, the Mollusks in seagrass beds ecosystem at Ela-ela beach has a moderate diversity. Species diversity level of Mollusks is caused by several factors, such as several species found in more number than the other ones and also the homogeneity of substrate (Arbi, 2011).

The value of evenness index (J) is 0.84. This index can show us the stability of a community whether it can be called stable when it has value of near to 1.00. At the opposite, it will not be categorized as stable when it reaches or is near 0. Fauna distribution is balanced or evenly spread when it has value of 0.6-0.8 (Odum, 1994). Generally, evenness index value in the research site at Ela ela Beach tends to be near 1, which means Mollusks community in that area is in a stable condition.

Richness index value (D) is 17.31. Based on the criteria, when the value of richness index is above 8.57, it will be categorized as high (Mason *et al.*, 2005). So the value of Mollusks species richness index is high. Generally, Mollusks species richness is affected by many factors connected to each other, particularly by environmental quality factor, either physically or chemically. Environmental quality is influenced by the pressure level undergone by the environment and its surrounding (Arbi, 2011). The high level of Mollusk species richness in the seagrass bed at Ela Ela Beach is also influenced by ecosystem condition around, such as seagrass bed, mangrove forest, and coral reef which are still in a good shape, hence they are important in providing foods, shelter, and any other kinds of life.

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