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Distribution Of Brittle Star (Ophiuroidea) on Rancabuaya Coastal Areas, Garut, West Java

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Abstract. This study aims to determine the distribution of brittle star (Ophiuroidea) in the waters of Rancabuaya coasts, Garut, West Java. The study was conducted in January-April 2016. The method used purposive sampling technique. The results showed that there were eight species (*Gymnolophus obscura*, *Ophiomastix venosa*, *Clarkcoma canaliculata*, *Ophiocoma alexandri*, *Ophiocoma echinata*, *Ophiocoma valenciae*, *Ophiocoma erinaceus* and *Ophiocoma scolopendrina*) into 4 genera and 2 families. Rancabuaya coastal has habitat characteristics with three types of substrate (rock, rocky and coral reef substrate) and the water conditions based on the substrate types (DO, pH, temperature, salinity) are in normal condition and suitable for the life of the Ophiuroidea. The species of *Ophiocoma scolopendrina* has the widest distribution compared to other species because the substrate is in accordance with habitat its species. The results of this study can be used as baseline data for future coastal waters management.

1. Introduction

Indonesia has a high diversity of animal species which are among the brittle stars [1]. The group of animals occupies a type of coastal waters in which there is an intertidal zone and can live in a variety of habitats and depths, such as coral reef zones, seagrass, live coral colonies and dead corals as well as at depths of one meter to thousands of meters [2] [3] [4] [5]. Rancabuaya coastal waters is one of the coastal waters that exist in the Province of West Java, especially in Garut district that has an intertidal zone. This coastal has a complete ecosystem such as seagrass, mangrove and coral reefs. Information about brittle starts distribution is needed to know the distribution of a species especially in its habitat, so that it can be known the habitat characteristics used by the species. Ecologically, Brittle start is one of the animals that have an important role in the community, as well as in the food chain.

At this time research on the distribution of brittle stars in the waters of Indonesian has been done by several researchers. As reported by Setiawan [6] on the habitat preference of the Ophiuroidea group in the coastal waters of Pancur, Alas Purwo. Another reported aspect of this animal group is its ecological aspects in Indonesian waters as well as in Wori waters, North Sulawesi [7], Southeast Sulawesi [8], [9], and other biological aspects in the waters of Cipatujah Tasikmalaya [10].

Information about the existence of Echinodermata especially the group of brittle stars (Ophiuroidea) from the waters of Rancabuaya, Garut has not been reported. Therefore this study aims



to determine the distribution of brittle stars (Ophiuroidea) on different substrate types and describes the condition of waters in Rancabuaya Coastal, Garut regency, West Java. It is expected that the results obtained can complement information on marine biota especially in the Echinodermata group, especially Ophiuroidea in Indonesian waters. The information about it, can add of the long list animal diversity in Indonesia.

2. Material and methods

This research was conducted in the Rancabuaya Coastal, Garut, West Java. The location of the study consisted of three types: Substrat (S) I, II and III (Figure 1). While the time of study conducted in January to April 2016.

Sampling of Ophiuroidea biota at each substrate was done four times observation using quadratic transect method. The observation plots uses frames measuring 1 x 1 m. The distance between the substrate of one with the other substrate along 50 meters with the number of plots of each transect as much as 25 plots of observation (Figure 1). Observations made during the water receding during the day. Each type of Ophiuroidea contained in the framework is recorded the number of species and the number of individuals. The brittle stars were sampled and photographed in the field; and photographs were subsequently analyzed in laboratory.

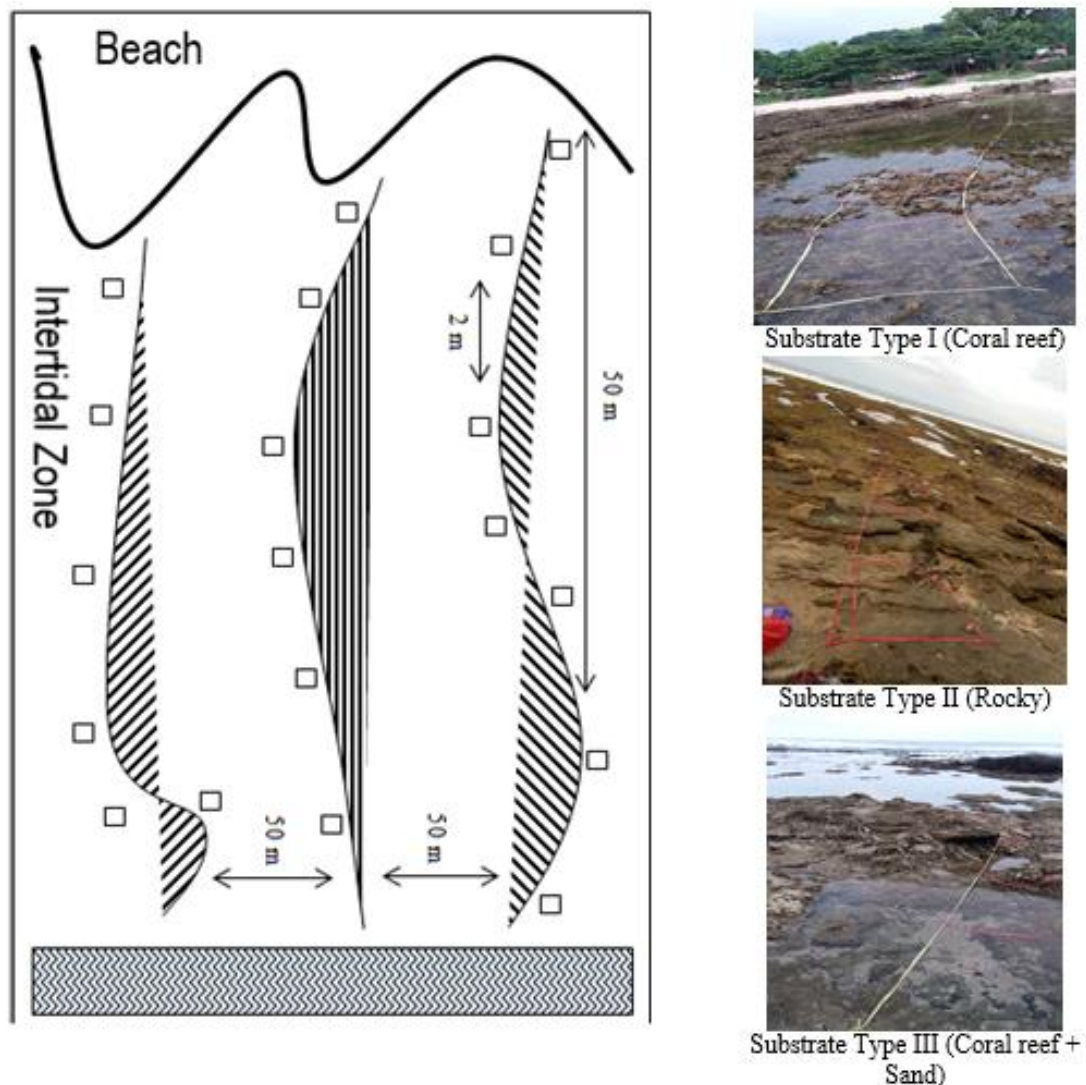


Figure 1. Sampling Design and substrate type used by Ophiuroidea on Rancabuaya Coastal, Garut.

Morphological characteristics identification were performed to determine which species of Ophiuroidea were found. Identification of Ophiuroidea using several references, i.e [11], [12], [13], [14], [15] and [16]. Data Analysis was used for count species composition and described about water condition on the location of Rancabuaya Coastal.

3. Result and discussion

The analysed sample contained 440 individual Ophiuroidea from three thypes of substrate. The sample was determined to represent eight species. The most commont species of brittle start were *Gymnolophus obscura*, *Ophiomastix venosa*, *Clarkcoma canaliculata*, *Ophiocoma alexandri*, *Ophiocoma echinata*, *Ophiocoma valenciae*, *Ophiocoma erinaceus* and *Ophiocoma scolopendrina*. One species were most abundant and has the widest distribution compared to other species, ie *Ophiocoma scolopendrine* (Table 1 and Figure 2).

In other waters such as pancur coastal, there are six species of Ophiuroidea found in different substrate types with *Ophiocoma scolopendrina* as the dominant species found [6]. In addition to the waters of Indonesia, this species is found abundant in other waters such as Cipatujah Tasikmalaya coastal [10] and coastal waters of sundak and kukup, Gunung Kidul [17]. Based on their habitat, this species is easily found in waters with coral habitat characteristics [2], so that it can be widely distributed in Indonesian waters.

Ophiuroidea is one of the most important components of fauna diversity in coral reefs as reported by [12], and [18]. According to [19], coral reefs play a very important role especially in the food chain (food web), because the biota generally acts as a detritus eater such as the Ophiuroid [20], especially in the species of *Scolopendrine ophiocoma* [21].

Table 1. Species composition and distribution on three location in the Rancabuaya Coastal

No	Species	n	Distribution		
			Substrate I	Substrate II	Substrate III
1	<i>Gymnolophus obscura</i>	30	12	8	10
2	<i>Ophiomastix venosa</i>	76	27	30	19
3	<i>Clarkcoma canaliculata</i>	36	20	6	10
4	<i>Ophiocoma alexandri</i>	41	21	14	6
5	<i>Ophiocoma echinata</i>	78	33	20	25
6	<i>Ophiocoma valenciae</i>	57	12	18	27
7	<i>Ophiocoma erinaceus</i>	32	15	7	10
8	<i>Ophiocoma scolopendrina</i>	90	35	26	29
	Σ	440	175	129	136

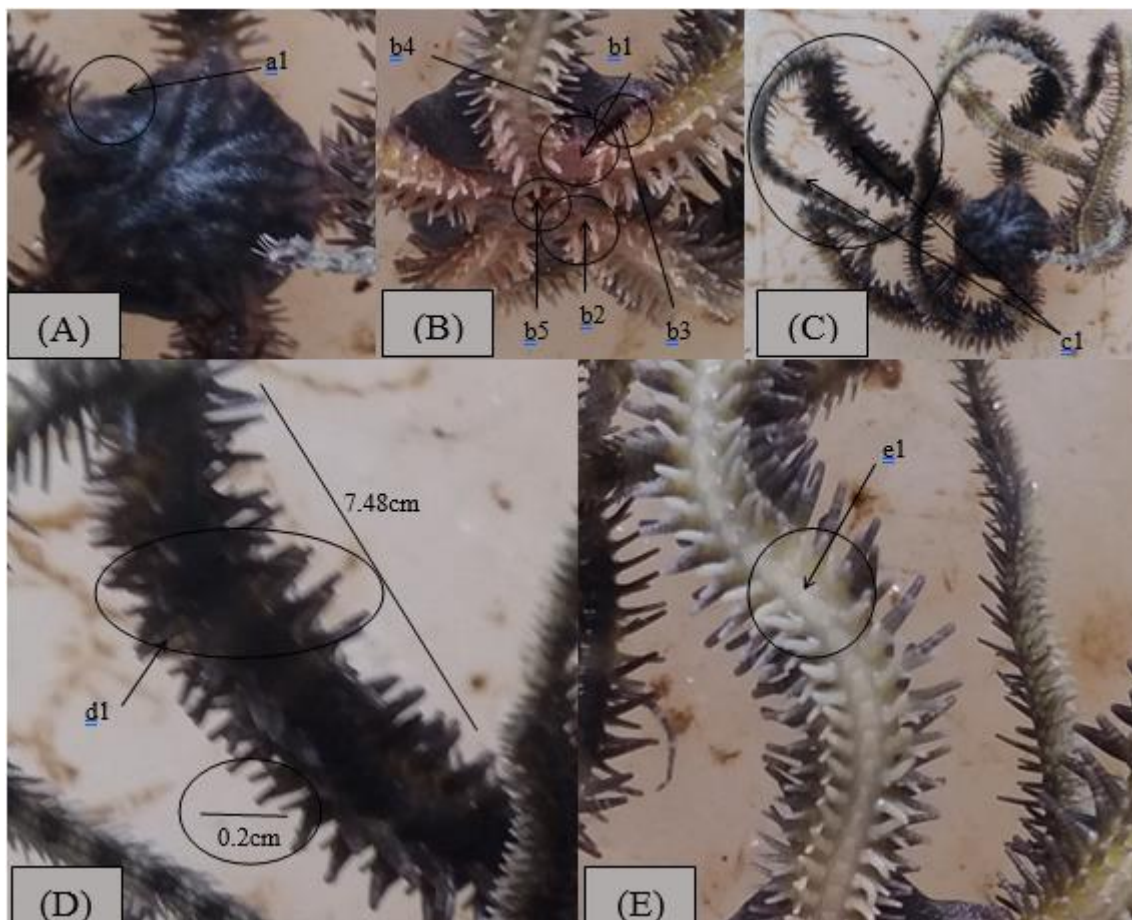


Figure 2. *Ophiocoma scolopendrina* and parts of the body: (A) Dorsal, (B) Ventral, (C) Arm length, (D) Length of thorn / arm bone, (E) Tentacles.

The research location of Rancabuaya coastal has three different substrate types, namely substrate with coral type, rocky substrate and coral substrate mixed with sand (Figure 1). The three substrate types are one of the habitats of the Ophiuroidea group [2] [6] located on Java Island. [2] distinguishes several habitats from topographic forms of coral reefs that can be occupied by the Ophiuroidea group (the sand zone, seagrass and seaweed, coral reef zones, reef zones and reef slopes).

Water condition such as DO, pH, temperature between one location and others show not the different value (Table 2). Water conditions can determine the distribution and presence of animal species especially brittle stars [22]. The conditions found in Rancabuaya coastal can still support the life of the brittle star. Water conditions such as normal salinity can support the life of Ophiuroidea as well as in maintaining reproductive patterns in species of *Ophiocoma aethiops* and *O. alexandri* [23], or temperatures that play a role in metabolism and mortality *Ophiopholis mirabilis* [24]. In addition, [25] [26], reported that two abiotic factors such as salinity and temperature have a direct influence on the length of the larval and embryonic phases. In general the conditions below or above the optimum requirements of salinity and temperature can inhibit or extend the embryonic phase and the larval period. Further, [2] states that brittle stars living in the tropics generally live in waters with temperatures ranging from 27 ° C to 30 °, but resistance to this temperature depends on geographical position and depth factor. Therefore, the condition of the coastal waters of Rancabuaya must be well maintained because the types of waters with polluted conditions can disrupt the life of animals in it including the brittle star [27].

Table 2. Water condition on Rancabuaya Coastal, West Java at Substrat (S) Types.

No	Parameter	S I	S II	S III
1	Temperature (°C)	27	27	27
2	pH	8.1	8.1	8.1
3	DO (Mg/L)	6	7	6.5
4	Salinity (%)	4.8	4.8	5

4. Conclusion

Eight species (*Gymnolophus obscura*, *Ophiomastix venosa*, *Clarkcoma canaliculata*, *Ophiocoma alexandri*, *Ophiocoma echinata*, *Ophiocoma valenciae*, *Ophiocoma erinaceus* and *Ophiocoma scolopendrina*) into 4 genera and 2 families was founded on Rancabuaya Coasts. *Ophiocoma scolopendrina* was a species with widely distribution that lived in moderately patches. Water condition of Rancabuaya coastal do not differ significantly from each other.

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