The Abundance and Distribution Patterns of Echinoderms in the Intertidal Zone of Nglolang Beach, Gunungkidul, Yogyakarta

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ABSTRACT

Echinoderms are marine animal invertebrates that are easily found in the intertidal zone to the deep sea. Nglolang Beach is dominated by rocky coral substrate with macroalgae that leads to an abundance of marine organisms such as Echinoderms. This research reports a study of the abundance and distribution patterns of echinoderms in the intertidal zone of Nglolang Beach, Gunungkidul, Yogyakarta. This observation started on 27 September 2020 at 12.00-13.00 p.m. Data were collected using plot quadrat method. In this study, an area of 1,197 m^2 was obtained so data collection was used for 12 plots or replications. Data analysis was performed by measuring Margalef index (D), Relative Abundance (RA), and Variant value (V) then the data were analyzed using a distribution pattern. The results based on the research are from 9 species that have discovered the highest relative abundance of Echinoderms in the intertidal zone of Nglolang Beach is Ophiocoma erinaceus with 54,44%. The distribution pattern of Echinometra mathaei, Tripneustes ventricosus, Tripneustes gratilla, Stomopneustes variolaris, Ophiocoma scolopendrina, and Ophiocoma erinaceus is clumped.

Keywords : abundance, distribution pattern, echinoderms, Nglolang Beach.

Diversity of echinoderms (Echinoidea and Ophiuroidea) in intertidal zone of Porok Beach, Yogyakarta, Indonesia

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Abstract :

Porok Beach is located in the western region of Gunungkidul which is known as a research station for the Faculty of Biology, Universitas Gadjah Mada Yogyakarta, Indonesia which has not yet developed as a tourism area. This coastal biodiversity can be said to be quite high because it has not received much influence from human intervention. The intertidal structure of this beach consists of coral, sand, and several parts to form a pool and almost the entire surface of the reef is covered by macroalgae. The purpose of this study was to determine the diversity of echinoderms in Porok Beach. The research was conducted on August 29th 2020 at 11.00-12.00 AM. Samples were taken during the day with sunny weather without clouds. The research was carried out at low tide so that the substrate conditions were easily visible. The coordinates of the sampling points used were -8°0802.8 "S and 110°33'28.8" E . Sampling was done using purposive random sampling method, then the sample was preserved and identified. Echinoderms identified by the Monograph of Shallow-Water Indo-West Pacific Echinoderms. Various types of echinoderms have been found on the coast of Porok. The diversity of echinoderms on Gunungkidul beach, especially Porok Beach, is not sufficiently well known. The results obtained from this study were several species from the Echinoidea class, namely *Echinometra mathaei, Stomopneustes variolaris* and *Heterocentrotus trigonaris*. The Ophiocoma class, namely *Ophiocoma erinaceus* and *Ophiocoma scolopendrina* species were recorded. This study in total succesfuly found 3 species of Echinoidea and 2 species of Ophiuroidea. Holothuroidea, Asteroidea and Crinoidea class were not yet found in this study.

Keywords : Porok Beach, Diversity, Echinoderms, Gunungkidul

Diversity of Echinoderm in Intertidal Zone between Sadranan and Slili Beach, Gunungkidul, Yogyakarta

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Abstract. Sadranan and Slili is one of the beaches located in Gunung Kidul which is dominated by the surface of the substrate in the form of sand, coral, and macroalgae, so that on this beach can be found various kinds of marine biota, one of which is Echinodermata. The variety of Echinoderms in the Indonesian coast, especiallyin intertidal zone between Sadranan and Slili beach, is not widely known, purpose of this research is to determine the diversity of Echinoderms on that beach. This research was conducted on at the time of maximum low tide. Sampling was carried out at Sarangan Beach using transect quadrat sampling method, then the sample was further preserved and identified. The results obtained from this study were the discovery of Echinoidea class namely the *Diadema setosum, Echinothrix calamaris, Heterocentrotus trigonarius, Echinometra mathaei, Tripneustes gratilla, Stomopneustes variolaris* and Ophiuroidea class namely *Ophiocoma erinaceus, Ophiocoma scolopendrina* and *Ophiomastix annulosa*. The conclusion from this study were the 9 species of echinoderms found including *Diadema setosum, Echinothrix calamaris, Heterocentrotus trigonarius, Echinometra mathaei, Tripneustes gratilla, Stomopneustes variolaris, Ophiocoma erinaceus, Ophiocoma scolopendrina* and *Ophiomastix annulosa*.

Keywords: diversity, Echinoderms, Sadranan beach, Slili beach

Echinoderm diversity in Porok Beach, Gunungkidul, Yogyakarta, Indonesia

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Abstract. Porok Beach is located in western region of Gunung Kidul, known as the research station of Faculty of Biology, Universitas Gadjah Mada, Yogyakarta, Indonesia which is not developed as a tourism area. The intertidal structure of this beach consists of coral, sand and several parts forming a pond and almost the entire coral surface covered by macroalgae. This research was conducted in the extreme dry rainy season in August 2019. In this beach has been found various kinds of echinoderms. The variety of echinoderms in Gunung Kidul coast, especially Porok Beach, is not widely identified. The aim of this research is to determine the diversity of echinoderms on that beach. Sampling was executed by using purposive random sampling method, then the sample was further preserved and identified. The results obtained from this study were several species from Echinoidea class namely *Heterocentrotus trigonarius*, *Echinometra oblonga*, *Diadema antillarum*, *Tripneustes gratilla*, *Tripneustes ventricosus*, *Stomopneustes variolaris* and *Echinothrix calamaris*, Ophiuroidea class namely *Ophiocoma scolopendrina*, *Ophiomastix annulosa*, and *Macrophiothrix longipeda*, Holothuroidea class namely *Holothuria atra* and *Holothuria impatiens*, Asteroidea class namely *Anthenea* sp.. This study found 7 species of Echinoidea, 3 species of Ophiuroidea, 2 species of Holothuroidea and 1 species of Asteroidea class.

Keywords: Echinoderms, Porok beach, diversity

Ethnozoological Approach to Fishery Activities: A Perspective in Gunungkidul, Yogyakarta

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ABSTRACT

Gumung Kidul is a Regency located in southern Yogyakarta, which is currently developed as a tourist attraction because of the beach. This research aims to find out the fishery activities, which consist of fishing techniques and gear, especially on commercial fishes using an ethnozoological approach in order to maintain the potential optimization of Gunungkidul area. Research is conducted by interviewing local fishermen with the following question: how the fishermen catch fish; the understanding of seasonal variability, points, position and topography of the sea; net and gross products; and the marketing strategy. The result is shown in a qualitative approach. Based on the result, we know that there are two most common fishing methods used by fishermen: gill net and nylon net method, but the gill net is more preferred by fishermen. The optimal time for fishing is in October, November, and December. White pomfret/Bawal (Pampus argenteus) and Largehead hairtail/Layur (Trichiurus lepturus) are two commercial fish that dominate the catch in October.

Keywords*: commercial fish, gill net, nylon net, fishing period, fishing result*

Vitamin C Content in Marine Macroalgae from Sepanjang Gunungkidul, Yogyakarta and its Potential Use as a Vitamin Source in Nutrition

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Abstract. Marine macroalgae are highly valued as a dietary raw material due to its nutritious and vitamins content. A number of species are widely used as a traditional human food by local communities in Gunungkidul, Yogyakarta. The use of marine macroalgae as human food should also be balanced with an understanding of the vitamin content that is beneficial to human health. Research on Vitamin C content in marine macroalgae from Sepanjang Gunungkidul has not been done, therefore our research aimed to study the content of vitamin C in marine macroalgae and its potential use as a vitamin source in nutrition. Field samples were collected on October 13th, 2019 at 1.30 pm during low tide using purposive random sampling method. Analysis of vitamin C content was carried out using the iodometric titration method. Our results showed that vitamin C content in the three class of marine macroalgae varies in concentration between 0.205 – 1.965 mg/mL. The highest vitamin C content is 1.965 mg/mL in *Sargassum polycystum* and the lowest is 0.205 mg/mL in *Palmaria palmata*. The high vitamin C content has led us to conclude that marine macroalgae has the potential use as food ingredients, cosmetics, and medicine.

Habitat Preference of Crustacea (Decapoda) of Porok Beach in Gunungkidul, Special Region of Yogyakarta

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Abstract. Decapoda is a member of crustacean that has a considerable high diversity rate especially in Porok Beach, Gunungkidul, Special Region of Yogyakarta. Decapoda is a lamun and macroalgae eater, it is frequently found in the lamun wilderness. The research aims to study the distribution and habitat preference of Decapoda into algae in Porok Beach, Yogyakarta. The research is carried out in October 2020 at three stations. Decapoda is taken with using square plot 1 x 1 m as much as 15 plots on these three stations. Decapoda that have been found in every plot is taken to identify, and the macroalgae are photographed to be counted in the number. The result shows that the Decapoda density in the first station is 0,04 ind/m2 with the number of individual 1 species, while the algae density is 56,03. The Decapoda density in the second station is 0,12 ind/m2 with the number of individual 3 species, while the algae density is 42,2. The Decapod density in the third station is 0,08 ind/m2 with the number of individual 2 species, while the algae density is 19,4. The most Decapods species found at Station II were valued at 0.12 ind/m2 with the density of algae is 42.2. The most preferred habitat for Decapods, especially Brachyura, are sandy coral areas with moderate/low density of algae.

Keywords: *Habitat Preference, Decapoda, Transect Square Method, Porok Beach*

The Abundance of Macroalgae in Intertidal Zone of Porok Beach Gunungkidul, Yogyakarta

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Abstract. Algae is a photosynthetic organism that plays many roles in the ocean, because it is autotroph, it can produce oxygen for the ocean and constitute the basis of the marine food chain. Research about diversity and abundance information of macroalgae in Porok Beach was limited. The study was conducted on September 27th, 2020. This research aims to study abundance of macroalgae in intertidal zone of Porok Beach. This research sampling method using line transects and stratified random sampling method were used quadrat plot 1x1 m which sub-plot 10 cm ×10 cm .The result showed that Chlorophyta has the most abundance in this place, the highest abundance is Cladophora sp. that has percent coverage 16,90 % and the lowest abundance is Halicystis sp. that has percent coverage only 0.042%.

Key words : Abundance, Gunungkidul, Macroalgae

EFFECT OF *Aplysia* sp. EXTRACT ON KALE (*Ipomoea* sp.) GROWTH IN DIFFERENT PLANTING MEDIUM

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ABSTRACT

Aplysia sp. are gastropods that generally live in marine ecosystems and are classified as benthic organisms with their main consumption being macroalgae. The nutrient content in the body of *Aplysia* sp. is the result of macroalgae digestions, including calcium (Ca), potassium (K), magnesium (Mg), sodium (Na), and phosphorus (P). These five elements are minerals necessary for plant growth. In this study, extracts from *Aplysia* sp. are made as a component that will enrich nutrients in two types of planting media for the growth of kale (*Ipomoea* sp.). Observation of the growth of kale seeds was carried out within 7 days with growth parameters in the form of plant height. The research design was carried out by factorial random design. To determine the effect of giving *Aplysia* sp. extract in the planting medium on the growth of kale seeds, the Tukey test (BNJ) was carried out with confidence levels of 99% and 95%. From the research that we conducted, it is known that the type of planting media and addition of *Aplysia* sp. extract has a close interaction with the growth of kale seeds. However, based on the BNJ test, there was no significant difference between the growth of kale seeds in the planting media with and without the addition of *Aplysia* sp. extract.

Key words: *Aplysia* sp. extract, planting medium, *Ipomoea* sp.