

Research Article

Status of Sea Urchin Resources in the East Coast of Borneo

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Received 2 May 2016; Revised 17 September 2016; Accepted 22 September 2016

Academic Editor: Jakov Dulčić

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Sea urchins are marine benthos that live in different habitats available at shallow and deep waters. In Malaysia, Sabah is the only state that exploits sea urchins without knowing the status of natural stocks. This study identified the sea urchin species diversity at shallow subtidal zones in east coast of Borneo which is part of the Coral Triangle. Belt transects were deployed to quantify the species composition and qualitative observations on the habitat types were also noted. Simultaneously, documentation of species available in several wet markets was gathered through impromptu conversation with the sellers. In this study, a total of 10 species of sea urchin were recorded from 18 sampling sites, namely, *Phyllacanthus imperialis*, *Diadema setosum*, *D. savignyi*, *Echinothrix calamaris*, *Mespilia globulus*, *Salmacis sphaeroides*, *Echinometra mathaei*, *Pseudoboletia maculata*, *Toxopneustes pileolus*, and *Tripneustes gratilla*. The most dominant one that showed a wide distribution was *D. setosum*. Three species are new records for Malaysia. Among the study sites, Semporna district showed the highest species number. Our findings illustrate that shallow waters on the eastern part of Borneo support high diversity of sea urchin resources. Future study should explore the sea urchin diversity at deeper waters and also on the west coast of Sabah.

1. Introduction

Sea urchins (local name: Landak Laut, Tayum, Tehe-tehe) are one type of benthos (phylum Echinodermata, class Echinoidea) which has spherical shape and is covered with long movable spines that live in different marine habitats, from intertidal [1] to deep-sea [2, 3] environments. They belong to the same phylum as sea cucumbers, sand dollars, sea lilies, sea stars, sea biscuits, and brittle stars [4]. Habitats of sea urchins include the coral reef areas and also rocky shores covered with seaweed [5, 6] and their colour varies among species such as brown, black, purple, green, white, or red. They also act as important grazers in the marine environment due to their habit of eating seaweeds and scraping the benthic microalgae; thus, they play a major role in controlling vegetation growth in the sea [7]. Diet of sea urchins also includes encrusting animals such as barnacles, gastropods, and worms [8].

About 1,000 species of sea urchins have been reported world wide [9] but documentation of its biodiversity in Malaysia is not well established. In Malaysia, sea urchins are being recorded in brief during coral reef monitoring as

indicator species for invertebrates category [10–12], while detail information on the biodiversity and ecology is very limited [13, 14].

In some Asian and Mediterranean countries, sea urchins are important marine resource due to the highly prized roe [15]. The demand for sea urchin roe is very high in Japan which leads to a well established fishery and resource management [16, 17]. In Malaysia, Sabah is the only state that has the custom of eating sea urchins' roe and it is being treated as valuable fishery resources especially by Bajau people. Based on preliminary survey before conducting this research, there is no official report on sea urchin landings in Sabah although sea urchin harvesting by coastal communities and marketing activities can be seen all the year round especially in public wet markets. Currently, list of fisheries important species of sea urchin in Sabah is also not available.

Thus, it is timely to make proper documentation about sea urchins' resources for future research needs because collection of sea urchins in such a large amount could also pose a threat to the natural stocks. Therefore, this research was designed to identify species of sea urchins in shallow waters of