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Short Communication: A new distribution record of the mud-spiny lobster, *Panulirus polyphagus* (Herbst, 1793) (Crustacea, Achelata, Palinuridae) in Mayalibit Bay, West Papua, Indonesia

RUDI A. WAHYUDIN[1], YUSLI WARDIATNO[2,♥], MENNOFATRIA BOER[2], ACHMAD FARAJALLAH[3], AGUS A. HAKIM[2]

[1]Doctoral Program in Aquatic Resources Management, Graduate School of IPB. Kampus IPB Dramaga, Bogor 16680, West Java, Indonesia.
[2]Department of Aquatic Resources Management, Faculty of Fisheries and Marine Science, Institut Pertanian Bogor. Kampus IPB Dramaga, Bogor 16680, West Java, Indonesia. Tel./fax.: +62-251-8622932, ♥email: yusli@ipb.ac.id
[3]Department of Biology, Faculty of Mathematics and Natural Sciences, Institut Pertanian Bogor. Kampus IPB Dramaga, Bogor 16680, West Java, Indonesia

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Abstract. *Wahyudin RA, Wardiatno Y, Boer M, Farajallah A, Hakim AA. 2017. Short Communication: A new distribution record of the mud-spiny lobster,* Panulirus polyphagus *(Herbst, 1793) (Crustacea, Achelata, Palinuridae) in Mayalibit Bay, West Papua, Indonesia. Biodiversitas 18: 780-783. Panulirus polyphagus* (Herbst 1793) (Crustacea, Decapoda, Achelata, Palinuridae) from Waigeo Island is illustrated and described in detail of morphological characters. This species is reported as new distribution record from Mayalibit Bay, Raja Ampat District, Province West Papua, Indonesia. One specimen was collected by local fisherman from muddy substrate waters at a depth of 10-40 m. The collection was made in June 2016. The present study adds more distribution of species in the world and enhances the marine diversity of Indonesian crustacean lists. Some brief biological information on the species is presented.

Keywords: Crustacean diversity, morphological description, new record, Pakistan lobster, Waigeo Island

INTRODUCTION

Among crustacean marine species lobsters are known to be industrial crustaceans in global fishery market (Chan 1998). A number of species can even be regarded as an esteemed commodity because of the high price in the market. Research in marine biodiversity in Indonesia is important to strengthen the fact that Indonesian waters are the biodiversity hotspot in the world. In Indonesia crustacean studies in marine ecosystem has been increasing since the last two years, and most of them focused on the biological information of valuable crustacean, e.g. Hamid and Wardiatno (2015), Santoso et al. (2015), Wardiatno et al. (2015a), Zairion et al. (2015), Hamid et al. (2016), Edritanti et al. (2016), Pramithasari et al. (2017), etc., but some studies showed the occurrence of crustaceans species in Indonesian waters and were closely related to marine biodiversity, e.g. hippoid crabs (Ardika et al. 2015; Mashar et al. 2015; Wardiatno et al. 2015b,c), palinurid lobsters (Wahyudin et al. 2016; Wardiatno et al. 2016a), nephropid lobster (Wardiatno et al. 2016b), scyllarid lobster (Wardiatno et al. 2016c), etc.

The spiny lobsters of the family Palinuridae Latreille, 1802 are all bottom-dwelling and can be found from very shallow water to a depth of 683 m (Chan 1998). All species of genus *Panulirus* are mainly nocturnal and live in coral or rocky reefs in depths less than 40 m (Chan 1998). Genus *Panulirus* is often brightly colored and spiny. All of the known species are to a greater or lesser extent of commercial interest as fishery commodity (Holthuis 1991). 7 species from 21 species of genus *Panulirus* are discovered in Indonesian waters (Holthuis 1991; Chan 1998; Chan 2010). Those species are *Panulirus femoristriga* (von Martens 1872), *P. homarus* (Linnaeus 1758), *P. longipes longipes* (Milne-Edwards 1868), *P. penicillatus* (Olivier 1791), *P. polyphagus* (Herbst 1793), *P. ornatus* (Fabricius 1798), and *P. versicolor* (Latreille 1804). *P. polyphagus* has a broad geographic range from Pakistan to Vietnam, the Philippines, Indonesia, northwest Australia, and the Gulf of Papua (Holthuis 1991). In Indonesia, the occurrence of the species has been not reported from Mayalibit Bay. This study of *P. polyphagus* reports the new distribution from Waigeo Island, Province West Papua, Indonesia.

MATERIALS AND METHODS

One specimen was collected in June 2016 from Mayalibit Bay, Raja Ampat District, Province West Papua, Indonesia by an artisanal fisherman. Location of specimen collection is shown in Figure 1. Spiny lobster is captured by hand directly at 5-10 m depth. The specimen was preserved in wood dust, transported in a life to the laboratory for assessment of morphological characters and identification. It was identified and described based on the

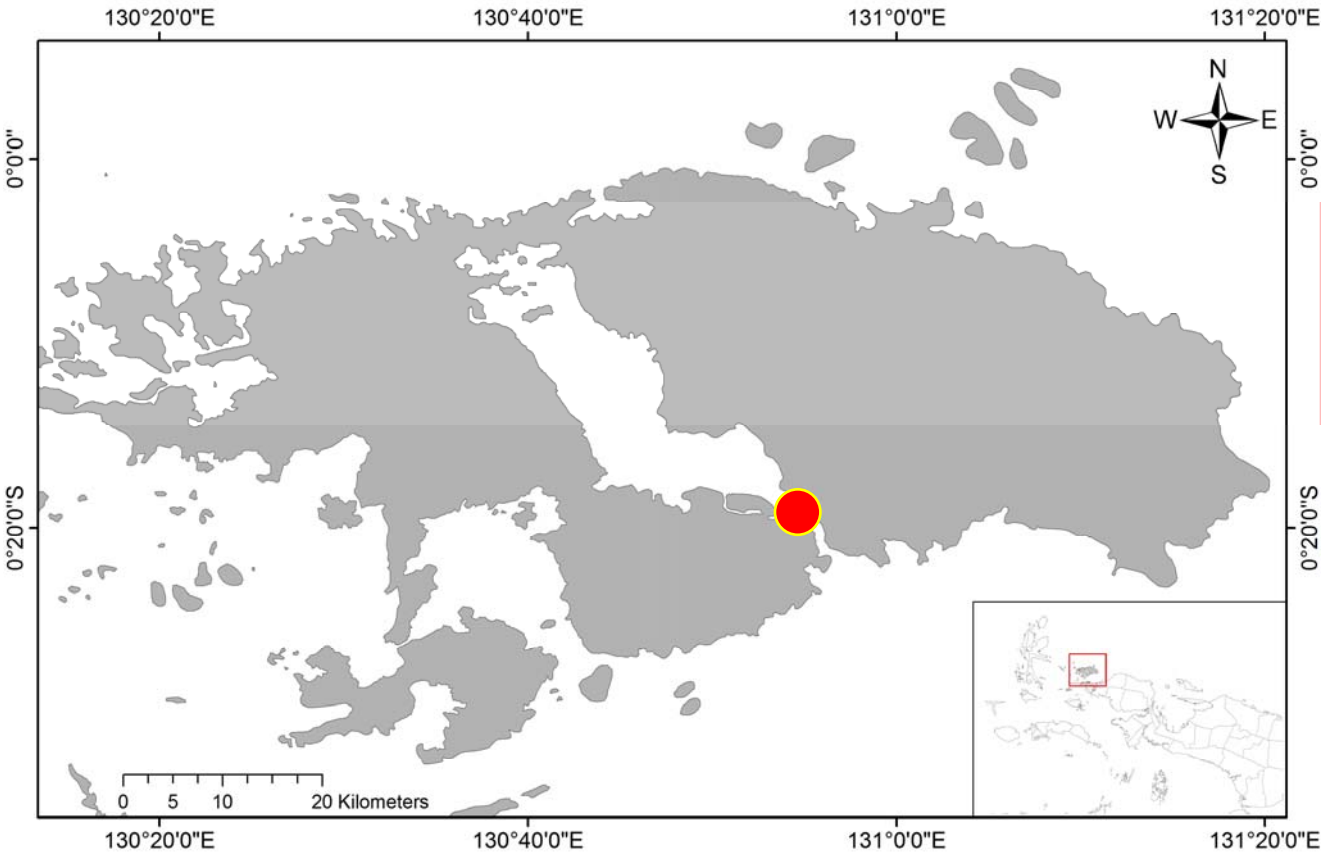

Figure 1. Map showing the location of Mayalibit Bay (●), Raja Ampat District, Province West Papua, Indonesia where the specimen was collected (the red circle). Insert is a map of Papua

morphological characteristics using the taxonomic key from Holthuis (1991) and Chan (1998). The specimen was preserved in 96% alcohol and deposited in the Department of Aquatic Resources Management, Institut Pertanian Bogor (Bogor Agricultural University), Indonesia.

RESULTS AND DISCUSSION

Taxonomy

Infraorder Achelata Scholtset Richter, 1995
Family Palinuridae Latreille, 1802
Genus *Panulirus* White, 1847

***Panulirus polyphagus* (Herbst 1793): see Figure 2**

Palinurus fasciatus Fabricius, 1798;
Palinurus polyphagus Bosec, 1802;
Panulirus orientalis Dofleln, 1900.

Examined material. 1♂: carapace length 74 mm, total length 243 mm, weight 230 gram, June 2016, Mayalibit Bay, Raja Ampat District, Province West Papua, Indonesia

Figure 2. A male of *Panulirus polyphagus* was collected from Mayalibit Bay, Raja Ampat District, Province West Papua, Indonesia. (CL: 74 mm, TL: 243 mm).

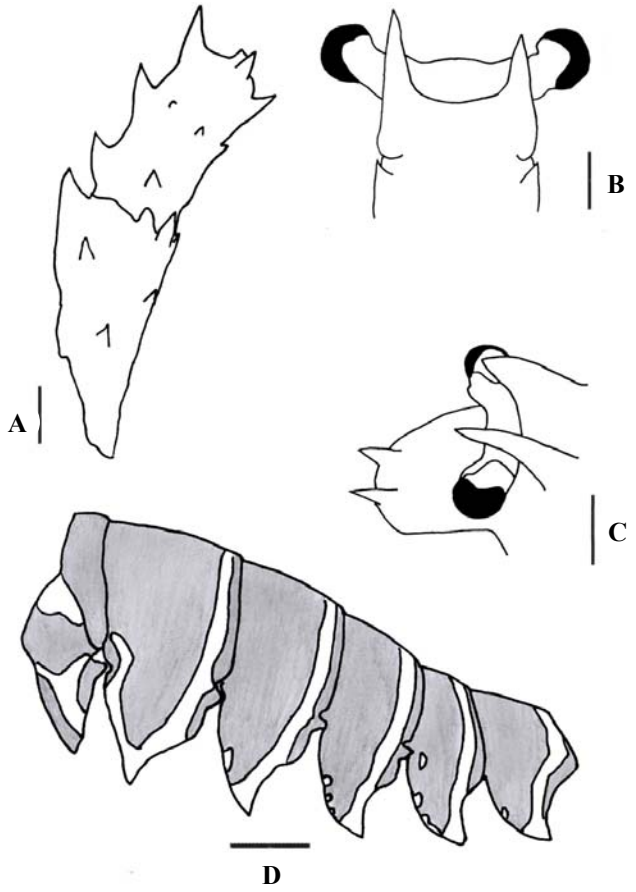

Figure 3. *Panulirus polyphagus* (Herbst 1793), Mayalibit Bay, Raja Ampat District, Province West Papua, Indonesia (male, CL: 74 mm.: A. Antennal peduncle, ventral view; B. Anterodorsal carapace; C. Antennular plate; D. Abdomen, lateral view. Scale bars, 10 mm

Description

Carapace spiny and rounded; rostrum absent; anterior margin with irregular-sized pines other than frontal horns; height of frontal horns less than two times the eye height, without spinules in between (Figure 3.B, 3.C). Antennules with flagella longer than peduncle (Figure 3.A); antennular plate at bases of antennae armed with one pair of well-separated principal spines only (Figure 3.C). Abdomen naked and smooth; without transverse grooves or sunken pubescent areas (Figure 3.D). Posterior half of the tail fan soft and flexible.

As mentioned above seven species of genus *Panulirus* are discovered in Indonesia waters. By comparing with the habitat of others, *Panulirus polyphagus* live in the different habitat. *P. polyphagus* is most commonly found in coastal waters on rocky and muddy substrates to a depth of 40 m, but it is occasionally seen at 90 m (Holthuis 1991) and live mainly at the river influenced shelf where the is shallow, turbid and heavy moderate run-off (George 1997). The specimen of this study was caught from Mayalibit Bay with muddy substrates near the river mouth.

In Indonesia, *P. polyphagus* was reported present in some location by the local unpublished report, but it was usually found in small number. Holthuis (1991) and Chan (1998) stated that *P. polyphagus* had a wide range in Indonesian marine ecosystem, but there was no any report mentioning its presence in the West of Sumatera, South of Java, and north of Papua. In this study, we added distribution range of *P. polyphagus* in Mayalibit Bay in Waegio Island, Raja Ampat District, Province West Papua, Indonesia. This present study would increase the marine crustacean list of Indonesia, and as consequently would also strength the fact that Indonesia is the marine biodiversity hotspot. The additional information on marine biodiversity is strongly related to the commitment of preserving world's natural resources sustainability, including marine life. As we have might know that United Nation in 2015 has declared and launched 17 Sustainable Development Goals with 169 targets for the next 15 years agendas. In marine diversity and sustainable development perspectives, the 14th goal of the agendas converges on the marine system in order to achieve conserve and sustainably use the oceans, seas and marine resources. The result of this study would also be used to support conservation planning for the sustainability resources in the research study and to enhance the ecological role of the area. In the future detail, biological information on *P. polyphagus* is needed to explore for ensuring its sustainable use and management.

Like other palinurid lobsters, *P. polyphagus* is also a commercial and expensive fisheries commodity in Indonesia. As mentioned above, there is still a lack of biological studies about this species in Indonesia. However, in some countries the research on the species has been reported, for example, allometric relationships (Mathap and Nair 1979), reproductive biology (Ikhwanuddin et al. 2014, Kagwade (1988a,b), and population dynamics (Kagwade 1988c). *P. polyphagus* was reported to attain sexual maturity at 6.02 cm CL for male and 6.59 cm CL for a female in Malaysia (Ikhwanuddin et al. 2014). Fecundity of *P. polyphagus* was estimated in the range of 143,000 until 4,723,000 egg productions (Kagwade 1988a), and the major spawning was in January and September and the minor in March and June (Kagwade 1988b). Values of growth parameters by von Bertalanffy's growth equation were 537 mm (male) and 443 mm (female) of asymptotic growth, 0.2000 (male) and 0.2231 (female) of curvature parameter, and 0.6037 (male) and 0.1985 (female) of the initial condition parameter (Kagwade 1988c). From fishery point of view, India produced 503.5 tons for males and 825.4 tons for females in 1993. With MSY value 520.365 tons for males and 837.8249 tons for female, it was estimated that the exploitation rate of male and female was 0.5096 and 0.4925, respectively (Kagwade 1993).

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