Distribution of *Matuta purnama* J. C. Y. Lai & Galil, 2007 (Brachyura: Matutidae) outside type locality

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Abstract. *Matuta* (Moon Crab) belongs to superfamily of Calappoidae which inhabit the sandy beach area. There are four species of *Matuta* which can be found in Indonesia, one of them is *Matuta Purnama*. The latest report, despite Indonesia, has long coastlines, showed that the distribution area of this species is only in Batu Karas Beach, Pangandaran Regency. This study reported the new distribution areas of *M. Purnama* in Indonesia. The organism samples were collected using the purposive sampling method in 21 sampling sites and preserved in 96% of alcohol solution. The identification process were conducted based on Lai and Galil, 2007. There were four new distribution area of *M. Purnama*, which are Panjanng Beach (west coast of South Sumatra), Bayah Beach, Karanghawu Beach, and Pangandaran Beach (south coast of Java). In other sampling sites, *M. purnama* have not been found, but the other Matutus species, *M. victor*, and *M. planipes* were found. This situation might be influenced by many factors, such as season and sea current, etc. This study was expected to be useful for conservation and management.

Keywords: dispersal; Indonesian waters; moon crab

1. Introduction

Genus *Matuta*, *Mebeli*, *Izanami*, and *Asthoret* belong to Superfamily Calappoidea which are characterized by lateral spine long and sharp, the shape of the carapace subcircular, , frontal margin of carapace trilobate, cheliped subequal, propodus and dactylus of pereiopod paddle-shaped [1, 2]. These genera can be found in a shallow subtidal area containing sandy substrate and widely distributed in the Indian Ocean [2].

Genus Matuta comprises of four species which are *M. victor*, *M. planipes*, *M. circulifera*, and *M. purnama*. They have been reported from Indonesia [1, 3]. The occurrence in Indonesia might be due to the long coastline which belongs to Indonesia rich of nutrients. Besides, the high activity in coastal areas...
of Indonesia also makes the coastal area rich in sources of nutrition for coastal biota, including the matutid crab that inhabits the sandy beaches. One of these activities is conducted by fishermen, like sorting the catch from the sea, and usually, they will leave their catches that are considered to non-economic or even damaged catches on the shoreline. This biota carcass can invite several coastal biotas to come and carry out eating activities on the shoreline. This study was aimed at reporting the distribution of the newest Matuta species, namely *M. purnama* in Indonesian waters.

2. Method

The samples were collected using purposive sampling method in several locations: west coast of Sumatera (Lhonga District, Aceh Besar Regency; Sibolga City; Natal District, Mandailing Natal Regency, Panjang Beach, Bengkulu), east coast of Sumatera (Kampai Village, Perlis Village, and Kwalu Serapuh Village, Langkat Regency; Sialang Buah Village; Serdang Bedagai Regency); south coast of Java (Bayah District, Lebak Regency; Karanghawu Beach, Sukabumi Regency; Pangandaran Beach, Pangandaran Regency), north coast of Java (Sukabumi Regency; Pangandaran Beach, Panci Village, and Kamberang Regency). All samples were preserved in alcohol 70% for a day and substituted with 96% alcohol for storage. Specimen was deposited in the specimen room of Biologi Departement, IPB University. Data were analyzed by the morphological approach. All specimens were documented using Canon power shoot camera. Specimens were identified using identification keys of [1-3].

3. Result and discussion

All Matuta species differed on the decoration upper the carapace (figure 1). *Matuta victor* has red dots on the upper of carapace, *Matuta planipes* has red lines on the upper of carapace [2], *Matuta circulifera* has eight reddish circles on the upper of carapace [4], while *Matuta purnama* has six reddish circles on the upper of carapace [3].

*Figure 1*. Matutid Crab. *Matuta planipes* (a), *Matuta victor* (b), *Matuta circulifera* (c), *Matuta purnama* (d). Scale of 1 cm.

*Matuta purnama* was found on the beach boundary conducting their activity such as swimming and sometimes immersed in the sand of the beach. Moreover, *Matuta purnama* were at the beach boundary to find foods. Genus Matuta and generally Decapoda group are omnivores. In aquatic ecosystems, they are detritivores and are known as keystone species.
Table 1. *Matuta purnama* outside the type locality.

| Locations                                  | Number of Individual | Sex               | Average of Carapace (mm) |
|--------------------------------------------|----------------------|-------------------|--------------------------|
| Bayah District, Lebak Regency, West Java   | 3                    | Ovigerous Female  | 44.2 25.9               |
| Karanghawu Beach, (Pelabuhan Ratu District, Sukabumi Regency, West Java) | 3                    | Female            | 43.9 26.1               |
| Pangandaran Beach (Pangandaran Regency, West Java) | 1                    | Male              | 54.2 31.4               |
| Panjang Beach (Bengkulu Province)          | 1                    | Female            | 43.9 25.7               |

Table 2. Other matutid samples and their sampling sites.

| Species          | Locations                                                   |
|------------------|-------------------------------------------------------------|
| Matuta circulifera | Panjang Beach (Bengkulu)                                   |
| Matuta planipes   | Aceh Besar Regency, Sibolga City, Mandailing Natal Regency, Perlis Island, Kwala Serapuh Beach, Serdang Bedagai Regency |
| Matuta victor     | Sibolga City, Kampai Island, Serdang Bedagai Regency, Tangerang Regency, Panjang Beach |

*Matuta purnama* species that were found were mostly female, and some were ovigerous females (table 1). This may indicate the high nutritional needs of females, especially ovigerous females, so that they spend most of their time on the shoreline looking for food and doing feeding activities.

Almost all of our samples were *Matuta victor* and *Matuta planipes* (table 2). In the previous study, these both Matuta were also reported from any location in Indonesia, i.e *Matuta victor* has been reported from Sumatera, Banda Sea, Jakarta Bay, Java Sea, Tanjung Priok, Bali, Pulau Weh, Celebes, Ujung Pandang (Makassar), Maluku, Natuna Island, Borneo, Sangihe Island, Jason’s Bay (Teluk Makhota), while *Matuta planipes* has been reported from Padang, Pulau Weh, Java, Ambon, Borneo [1]. *M planipes* was reported usual inhabit the tropical sandy shores [5].

The latest report of this genera is the *Matuta purnama*. This species was very resembled to *Matuta circulifera* (figure 1) which was reported for the first time from Indonesia as well [4]. All *Matuta purnama* that has been reported comes from the coast directly opposite the Indian Ocean (figure 2). They might be arrived on the Indonesian coastline due to their planktonic dispersal when in larval phase throughout the sea current. In its life phase, Infraordo Brachyura, including genus Matuta, has a larval phase [6].

**Figure 2.** New Distribution Area of *Matuta purnama* and the locality type. PB: Panjang Beach (Bengkulu); BH: Bayah Beach; KH: Karanghawu Beach; PN: Pangandaran Beach; BP (Batu Karas Beach, Type Locality, Previous study).
4. Conclusions
The current report of *Matuta purnama* outside the type locality was from Panjang Beach, Bayah Beach, Karanghawu Beach, and Pangandaran Beach. These locations directly opposite the Indian Ocean.

References
[1] Galil B S and Clark P F 1994 *Zool. Verh. Leiden* **294** 1−55
[2] Naderloo R 2017 *Atlas of Crabs of the Persian Gulf* (Iran: Springer International Publishing) p 1−439
[3] Lai J C Y and Galil B S 2007 *Raffles B Zool.* **16** 75−77
[4] Miers E J 1880 *Ann. Mag. Nat. Hist* **5** 304−317
[5] Galil B S and Mendelson 2013 *BioInvasion Rec.* **2** 69−71
[6] Anger K 2001 *The Biology of Decapod Crustacean Larvae, Crustacean Issues* (United Kingdom: Taylor & Francis) p 1−262