Newly distribution record of four marine crabs (Decapoda: Brachyura) collected from Seribu Island-Jakarta, Indonesia

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Abstract. Brachyuran is an important biotic component in marine ecosystems, and is known as a keystone species. Information about brachyuran species in Indonesia, in this case from Seribu Islands-Jakarta, is still limited, especially for the non-economic crabs. Based on the manual sampling, it was found that there are four crabs that have not been reported from the Islands, i.e. Ozius guttatus, Carpilius maculatus, Gelasimus hesperiae, and Etisus laevismanus. In term of ecological point of view, the Islands are influenced by the Jakarta Bay as food provider for supporting the live of brachyuran crab. Crab database is necessary to increase the utilization of crabs in the future, e.g. as antibacterial activity and the sources of chitin and chitosan.

Keywords: Decapod crab, Jakarta Bay, new report, marine resources, small-island biodiversity

1. Introduction
Crustaceans are shelled-aquatic biota. They are divided into 6 classes, 13 subclasses, 42 orders, and 849 families [1]. There are about 68,000 Crustacean species have been identified in the world, but about 150,000 not being identified yet, including Brachyuran [2].

Brachyuran has existed since the Jurassic times [3], consisting of 93 families [4] and 7,047 species [5]. They live in terrestrial, semi-terrestrial, freshwater and mostly in the sea, hiding in rocks, corals, seagrasses, mangroves, walking on the sand, and swimming freely in the water or settling in the bottom of the water. Aquatic Brachyuran are widespread in Indonesia having the longest coast (coastal waters) [6], the largest coral reef [7] and the largest mangrove forests [8] in the world.

Indonesia is located in the tropics and is the largest maritime country in the world with an area of 6.3 million km² of water, and has a coastline of 99,093 km [9]. Indonesian sea is the world's marine biological center [10] and more than half of the species in the world can be found in the tropics even though the tropics contribute only 7% to the world area [11]. One area containing Brachyuran in Indonesia is Jakarta waters.

As the capital city of the country and the center of the national economy, Jakarta is one of the most populous city in Java island. Jakarta has a Jakarta Bay facing directly to the Java Sea [12]. The
development of the metropolitan area and the surroundings made the Bay of Jakarta receives organic and inorganic waste through the rivers flowing from the mainland. The northern part of Jakarta Bay has a cluster of Seribu Islands Marine National Park consisting of 110 islands inside [13]. Seribu Islands region consists of small islands, many surrounded by coral reef ecosystems, suitable habitat for Brachyuran. However, information about the presence of infraordo Brachyura in Jakarta Bay from 1977 to 2015 has been mostly reported on economical crabs, while the data of the non-economical crabs is still lacking [14].

2. Materials and methods
The sampling was carried out from February 27 to March 9, 2019, in Seribu Islands Indonesia, Marine National Park (figure 1). In this study, the Convenience Sampling Method was applied [15]. All specimens were photographed using Canon EOS M50 camera and preserved in 70% alcohol for one day, then substituted in 96% alcohol for storage and deposited at Laboratory of Biosystematics and Animals Ecology.

3. Results
There were four species of crabs were recorded as newly distributed species in Seribu Islands, Jakarta. They were Oziusguttatus, Carpilius maculatus, Gelasimus hesperia, and Etisus laevimanus (figure 2).

3.1. Ozius guttatus (A. Milne Edwards, 1873)
**Materials.** 2 individuals, Harapan Island (5°39′10.0″S 106°34′51.0″E), Collector: Our Team

**Habitat.** Rocky beach, mangrove swamp, coral reef and continental slope in the depth of 800 m [16], in this case it was found in estuarine gap at low tide.

**Description.** The carapace shape is transversely ovate, convex and glabrous surface texture; there are five teeth on the anterolaetral side and four blunt lobes on the frontal side. Cheliped of right side is
bigger than the left. Four pairs of walking legs and no swimming legs. The dominant color of dark brown body; manus (palm) is faded yellow.

**Distribution.** World: Somalia [17], Thailand [18], China [19], Malaysia [20], Taiwan [21], Australia [22], Kenya [23], Red Sea [24], Kamboja [25], India [26], New Caledonia [27]; Indonesia: Lombok [28], Anambas Islands [29], South Sulawesi [30], Maluku [31].

**Remarks.** This crab has a common name called spotted rock crab. These crabs kill their prey using special curved teeth at the base of their large claws to cut them into smoother ones. Adult crabs also develop molariform teeth, which can fight their victims [32].

![Crab Images](image1.png)

**Figure 2.** Four species with newly distribution record in Seribu Islands (Archipelago), (a) *Ozius guttatus*, (b) *Carpilius maculatus*, (c) *Gelasimus hesperiae*, (d) *Etisus laevimanus*.

### 3.2. *Carpilius maculatus* (Linnaeus 1758)

**Materials.** 1 individual, Penjaliran Island (5°27'51.6"S 106°33'01.8"E), Collector: Mr. Tami (Fisherman).

**Habitat.** Near a coral reef with a depth of 3-30 meters and most were found in the depth of 3-6 meters [33].

**Description.** The carapace shape is transversely ovate, convex and glabrous surface texture; there is one anterolateral tooth and eleven purple spots. Cheliped of right side is bigger than the left. Four pairs of walking legs and no swimming legs. The color of the base of the carapace is pink, the tip of the manus is yellow.

**Distribution.** World: New Caledonia [27], China [19], India [26], Thailand [18], Taiwan [34], Prancis, South Afrika, Red Sea, Australia, Filipina, Malaysia, Jepang, Hawai [35]; Indonesia: Anambas Islands [36], Ambon [37].
Remarks. This species is reported to be toxic but has not been confirmed by biochemical test [38]. These crabs are reported to be active at night to look for leftovers [39]. Also known as seven-eleven crab, spotted reef crab, akamongani (Japan), and moon crabs (Harapan Island). In addition, this crab was used as a picture for stamps in France, Samoa and Papua New Guinea [38].

3.3. *Gelasimus hesperiae* (Crane, 1975)

**Materials.** 1 individual, Harapan island (5°39′07.6″ S 106°34′31.8″ E)

**Habitat.** Intertidal, muddy and sandy / muddy substrate [32].

**Description.** Quadrangular carapace and wide front carapace. Sometimes there are 2 or 3 anterolateral teeth. The lateral margins of the carapace are slightly convergent, the proximal and median teeth in the two cheliped are larger. Males have larger cheliped and are found in large tubercles on the outer surface.

**Distribution.** Indian Ocean: East Africa, Red Sea, Gulf of Oman, Persian Gulf, Pakistan, India, Sri Lanka, Burma, Singapore, IndoWest Pacific: South Africa to Somalia, Burma, Thailand, Western Indonesia, Western Malaysia.

3.4. *Etisus laevimanus* (Randall 1840)

**Materials.** 29 individuals, Harapan island (station 6 (5°39′03.0″ S 106°34′40.4″ E))

**Habitat.** Intertidal to 9 m, rocky or coral substrates [32].

**Description.** The carapace is wider than its length. The anterolateral margin is five teeth. Adult chelae are longer than carapace, the color are dark gray to reddish brown, and dark brown.

**Distribution.** Indo West Pacific, Madagascar, Seychelles, Red Sea, southern Oman, Persian Gulf, Gulf of Oman, India, Maldives, Taiwan, Japan, Australia and Hawaii; Indonesia: Tanakeke Islands, Poteran Islandand Madura Islands.

4. Discussion

On the basis of table 1, studies of Brachyura in Seribu Island have been carried out before, starting from 1977 to 2015 [14]. Previous reports obtained several families from economical and non-economic crabs in infraordo Brachyura. Families that have never been reported from this study were Oziidae and Carpiliidae. The family is a family of non-economical crabs on the market. So that the addition of new information data about non-economical crabs in Seribu Island has increased by two families until 2019.

| Year | Authors | Family |
|------|---------|--------|
| <1977 | Romimohtarto&Moosa | Trapeziidae and Haplocarcinidae |
| 1980 | Moosa | Portunidae |
| 1977-1979 | Toro | Portunidae |
| 1993 | Burhanuddin | Portunidae |
| 2010 | Pratiwi | Alphaeus |
| 2012 | Widyastuti&Pratiwi | Portunidae |
| 2015 | Anggraeni et al. | Portunidae, Majidae, Galenidae, Dromiidae, Calappidae, Ocypodidae, Grapsidae, Porcellanidae, Macrothelminidae, Xanthidae, and Pilumnidae. |
| 2019 | Unpublish data (Our result) | Oziidae*, Carpiliidae*, Xanthidae, Ocypodidae |

*New report family*
The widely dispersed of Brachyuran in the world result from their larval phase [3]. It makes them can be taken by the current flow and/or move by themselves by swimming. Diversity of Brachyuran in Seribu Islands might result from their suitability in their marine ecosystem supporting their offspring fitness. It provides a good environment and adequate food.

5. Conclusion
This study reported four new species distribution of Brachyuran from four-family, and two-family were new in Seribu Islands. These waters have many types of habitat that possible for Brachyuran living.

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