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SHORT COMMUNICATION

First Record of *Hippa adactyla* (Fabricius, 1787; Crustacea, Anomura, Hippidae) from Indonesian Waters

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Abstract: Spesimen *Hippa adactyla* (Crustacea, Anomura, Hippidae) telah dikutip daripada beberapa pinggir laut Indonesia (Sumatera, Java, Bali-Lombok dan Sulawesi). Penemuan ini menunjukkan rekod pertama spesies ini di Indonesia dan mengesahkan kewujudannya di Lautan Hindi dan di kawasan Wallacea. Sifat-sifat sistematik dan morfologi spesies ini telah dihuraikan, dan taburannya di Indonesia telah dipersembahkan. Salah satu sifat utama spesies ini ialah lobus median pada bahagian anterior karapas yang mempunyai 3–4 lobus. Begitu juga, antena kiri mempunyai 2–6 artikel.

Kata kunci: Anomura, Penemuan Pertama, *Hippa adactyla*, Indonesia

Abstract: Specimens of *Hippa adactyla* (Crustacea, Anomura, Hippidae) were collected from several coasts of Indonesia (Sumatera, Java, Bali-Lombok and Sulawesi). This finding represents the first record of this species in Indonesia and confirms its presence in the Indian Ocean and in the Wallacea region. Its systematic and morphological characteristics are described, and its distribution in Indonesia is presented. One of the main characteristics of this species is a median lobe in the anterior part of the carapace, which has 3–4 lobes. Likewise, the left antenna has 2–6 articles.

Keywords: Anomura, First Finding, *Hippa adactyla*, Indonesia

The sand crab superfamily (Hippoidea) is distributed from the Western Indo-Pacific to the Atlantic regions (Boyko & Harvey 2002). These sand crabs live in the intertidal areas (swash zones) and engage in very quick sand digging (Lastra *et al*. 2002). The presence of sand crabs of the family Hippidae in Indonesia is well known, but few studies have been performed on this group. Several members of the Hippidae family are present along the seashore of Indonesia, such as species of the genera *Hippa* (Fabricius 1787) and *Emerita* (Scopoli 1777). Other species include *Hippa admirabilis* in Papua New Guinea and *Hippa celaeno* in Makassar (Sulawesi) and Ambon (Moluccas; de Man 1896).

Information about the existence of sand crabs of the genus *Emerita* was revealed by Efford (1976) during an expedition in Bengkulu (Sumatera). Members of the family Hippidae are also widely distributed along the west coast of Sumatera and the south coast of Java. The abundance of *Hippa adactyla* (also

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known as *Remipes testudinarius*; Miers 1878) has been important in the field of exploration research. This species is distributed from Madagascar to Australia and extends eastward to the Marquesas Islands and northward to Japan (Boyko & Harvey 1999). However, the presence of this sand crab from Sumatera to Java has not been recorded. This report constitutes the first record of *H*. *adactyla* in Indonesia.

Genus *Hippa* Fabricius, 1787

Hippa adactyla

Examined material: Sumatera. Bengkulu: 3 males, 1 ovigerous female (MZB Cru 4105), 3° 47’ S 102° 14’ E, coll. D. Purnama, 10 September 2014; Padang Pariaman: 1 male, 1 ovigerous female (MZB Cru 4106), 0° 27’ S 99° 58’ E, coll. P. U. Ardika, A. Farajallah, F. Akhsani, 27 September 2014. Java. Pelabuhan Ratu, Sukabumi: 1 female, 1 ovigerous female (MZB Cru 4107), 0° 32’ S 100° 04’ E, 27 December 2013; Pangandaran: West Beach, 5 males, 3 ovigerous females, 3 females, 7° 41’ S 108° 39’ E, coll. K. A. Widayati, J. I. Dwifajarningsih, 22 December 2014; Cilacap: 3 ovigerous females (MZB Cru 4108), 7° 43’ S 109° 01’ 31.6” E, coll. Institut Pertanian Bogor (IPB), 11 Mar 2013. Bali. Gianyar: Lebih Beach, 1 male, 4 ovigerous females (MZB Cru 4115), 8° 07’ S 115° 04’ E, coll. Y. Wardiatno, A. Mashar, A. Farajallah, 22 September 2014. Lombok. Gili Meno Island North Lombok, Gili Indah: 2 males (MZB Cru 4116), 8° 20’ S 116° 03’ E, coll., Y. Wardiatno, A. Mashar, A. Farajallah, 22 September 2014. Sulawesi. Banggai Island: 1 female (MZB Cru 4117), 1° 36’ S 123° 29’ E, coll. M. Sataral, 1 November 2013.

The collection of samples was performed by hand along the coastline of each study site. The specimens were photographed with a Canon 1100D camera (Canon, Tokyo). They were preserved in 70% alcohol, which was replaced with 96% alcohol in the laboratory, and then drawn using a camera lucida. The specimens were deposited in the Zoologicum Bogoriense Museum, Research Institute of Biology, Indonesian Institute of Science (LIPI), Indonesia.

In total, 35 specimens were collected. The fresh specimens exhibited a greyish black-and-white pattern on the carapace (Fig. 1). The carapace length is 2.4 to 3.5 cm, and it has a round to oval shape. The median lobe consists of two lobes with one thorn in the middle, similar to *H*. *admirabilis.* In the submarginal carapace, there are 46 to 59 setose pit rows. The main distinctive characteristic of these specimens is the number of articles in the antenna. The left antenna had 2–6 articles, and the number increases with growth and age (Haig 1974). The ocular peduncle was longer than that of other *Hippa* species. The first right and left pereopod commonly had different lengths. The specimens in this study had an elongated, orange-coloured spermatophore located near the left third pereopod. *H. adactyla* is a synonym of *Remipes testudinarius* from New South Wales (Haig 1970).

Figure 1: Specimen of *H*. *adactyla* (ovigerous female) from Pelabuhan Ratu, south coast of Java, Indonesia.

SYSTEMATICS (Boyko & Harvey 1999):
Infraorder ANOMURA Macleay, 1838
Family HIPPIDAE Stimpson, 1858
Genus *HIPPA* Fabricius, 1787
Remipes denticulatifrons White, 1847 (junior synonym)
Remipes testudinarius Latreille, 1806 (junior synonym)
Remipes testudinarius var. *denticulatifrons* Miers, 1878 (junior synonym)
Hippa adactyla Fabricius, 1787

TYPE MATERIAL. Pelabuhan Ratu, Sukabumi: 1 female, 1 ovigerous female (MZB Cru 4107), 0° 32’ S 100° 04’ E, 27 December 2013.

Diagnosis: The transverse grooves of the carapace are brown, with short antennules and four median lobes (one lobe is located in the middle; Fig. 2[a]). The first simple pereopod is elongated and has no cheliped (Fig. 2[b]). The dactyl is acute (Fig. 2[c]). The antennules have three to four articles (Fig. 2[d]). The carapace of *H*. *adactyla* is wide and flat (Fig. 2[e]). The submarginal rows are not clear and range from 25 to 40 rows.

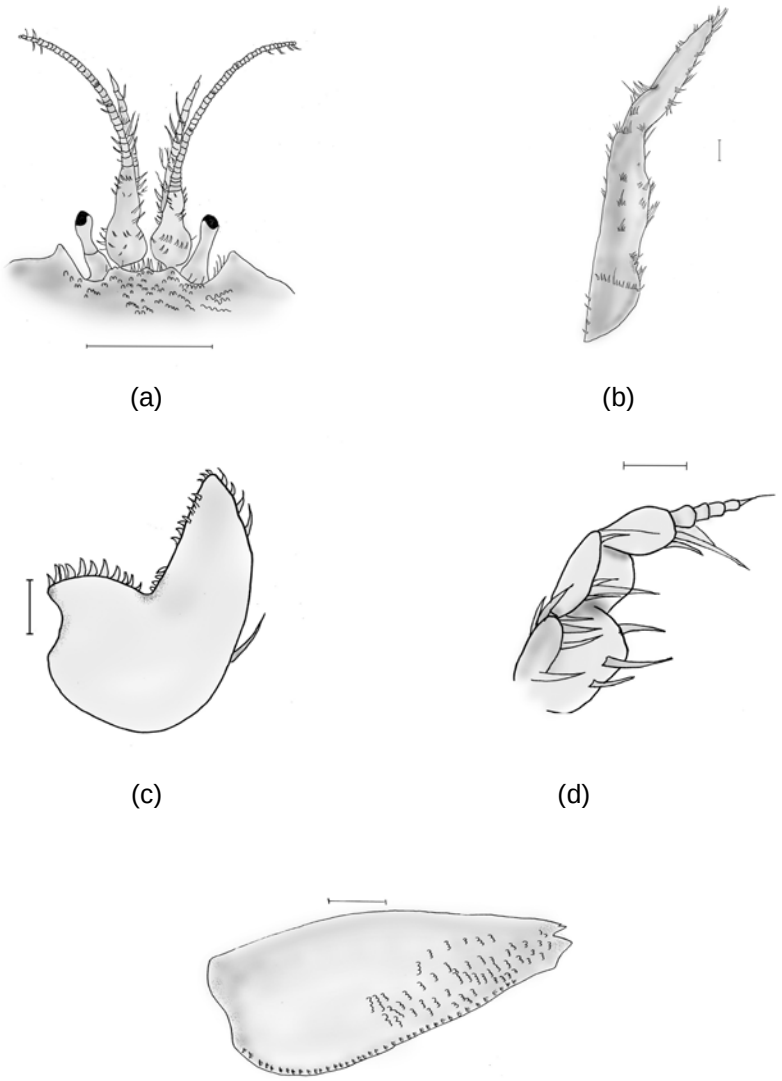

Figure 2: *H. adactyla* (Fabricius, 1787), 34.2 mm: (a) anterior carapace, dorsal aspect; (b) right pereopod 1; (c) dactyl, outer aspect; (d) antennules, inner aspect; (e) submarginal carapace.

Note: bar scales: a, d, e = 3.0 mm; b = 2.0 mm; c = 1.0 mm

The morphological characteristics of the specimens in this study were consistent with those of the *Hippa* species from Taiwan (Fabricius, 1787) and with *H. adactyla* (Osawa *et al.* 2010). *H. adactyla* is a species in the family Hippidae and has been reported in Taiwan and Australia (Haig 1970). This species inhabits swash zones and engages in sand digging. It has been found along the west coast of Sumatera (Padang) and from the south coast of Java (Pelabuhan Ratu) to Bali. Interestingly, we also found one specimen on the Banggai Island of Sulawesi. No previous reports suggest that this species was found in Kalimantan. The *H. adactyla* specimens from each location exhibit the same characteristics and colours. This species is also morphologically identical to *Hippa ovalis*, which is found in Sulawesi (Osawa *et al.* 2010). The specimens found on the west coast of Sumatera had an average length and width of 2 to 3 cm. These specimens differed from those on the south coast of Java and Bali-Lombok because the latter had an average length and width of 3 to 4 cm.

Based on the distribution of this species in Taiwan (Osawa *et al.* 2010), it is likely that its distribution might be affected by sea currents and several biological factors. The textures of the substratum of the west coast of Sumatera and the south coast of Java are nearly identical, i.e., rough brown sand. The colour of the crabs' carapace was influenced by the colour of the sand in their particular habitat (Wenner 1972). More female specimens than male specimens were found in this study. Ovigerous female specimens were dominant. This phenomenon indicates the regeneration of this species (Forward *et al*. 2007). The scarce information on the biology and distribution of *H*. *adactyla* does not clearly indicate the geographical distribution of this species. The presence of sand crabs along the coast of Sumatera, Java, Bali-Lombok and Sulawesi needs further study, and a phylogeographic analysis would help elucidate the source of this population in the Indonesian intertidal zones.

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