First record of *Thalassina kelanang* (Crustacea: Decapoda: Thalassinidae) from the Philippines

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ABSTRACT

The first record of mud lobster *Thalassina kelanang* (Moh and Chong, 2009) from the Philippines was documented in the mangrove forest of Suyac Island, Sagay City, Province of Negros Occidental. The male specimen with a total length of 16.5 cm and 4.5 cm carapace width was found surfacing the mangrove substrate in January 2019. Further survey yielded two more specimens. The specimens had an obtuse rostrum, and a deep median sulcus, which extends posteriorly, nearly the same length but behind the adrostral carinae. The slenderly elongate petasma bears conspicuous spines in the proximal lateral margin. The mounds of *T. kelanang* with heights ranging from 5 to 15 cm were smaller compared to those of *Thalassina anomala*. This is the fourth *Thalassina* species reported from the Philippines.

Keywords: first record, mud lobster, *Thalassina kelanang*, Suyac Island, Sagay City, Negros Occidental

INTRODUCTION

There is limited information on the diversity of mud lobsters *Thalassina* (Latreille, 1806) in the Philippines. At present, only three species were reported: these are *Thalassina anomala* (Herbst, 1804), *Thalassina squamifera* (De Man, 1915) (Ngoc-Ho and de Saint Laurent 2009), and the recently discovered *Thalassina spinosa* (Ngoc-Ho and de Saint Laurent, 2009) in Panay Island (Bedi and Primavera 2018). These three are among the 10 extant species under the genus *Thalassina*: *T. anomala*; *T. gracilis* (Dana, 1852); *T. squamifera*; *T. spinosa*, *T. spinirostris and T. krempfi* (Ngoc-Ho and De Saint Laurent, 2009); *T. kelanang* (Moh and Chong, 2009); *T. australiensis* and *T. saetichelis* (Sakai and Türkay, 2012); and *T. pratas* (Lin et al. 2016) (Sakai and Türkay 2012; Lin et al. 2016).

Mud lobsters known in Western Visayas as “uson” (Hiligaynon) are well adapted for burrowing in muddy and sandy habitats and can live in

anaerobic environments. They, therefore play a critical role in nutrient cycling (Malley 1977; Ng and Kang 1988). They usually inhabit mangrove forests and are known for their mound-building characteristics. However, recent discovery of the 10th species, *T. pratas* found in seagrass beds made an unusual pattern (Lin et al. 2016) from *Thalassina*'s previously known mangrove habitat. Nevertheless, deep burrows and cryptic behaviors of mud lobsters may have resulted for the species to be least studied (Moh et al. 2015) compared to other members of the family Thalassinidae. A specimen of *T. kelanang* was found in Suyac Island, Sagay City, Negros Occidental. This is the fourth *Thalassina* species inhabiting the Philippine Islands.

METHODS

Mud lobsters examined in this study were collected from Suyac Island, Barangay Taba-ao, Sagay City, Province of Negros Occidental in January 2019. Suyac Island is almost 3 km from Old Sagay Port; accessible by a 15-minute boat ride. The roughly 2 ha island is surrounded by about 15 ha mangrove forest. The mangrove forest is composed mostly of matured (possibly century old) assemblages of *Sonneratia alba, Avicennia marina*, and *Rhizophora* spp. The island has four mangrove zones: *S. alba*, *Rhizophora* spp., *Aegiceras floridum*, and a mixed *S. alba–A. marina–Rhizophora* spp. zone. The island is sandy nearshore, and sandy-loam inward the mangrove forest.

One male *Thalassina* was found surfacing on the mangrove substrate during the mangrove rehabilitation and conservation planning with the community. The species is hardly known in the area, thus, the specimen was caught and brought to the Northern Negros State College of Science and Technology, Fisheries Research Center for identification. The organism appeared to have recently molted because of its slightly soft exoskeleton. The specimen was preserved in 10% buffered formalin and labeled as *Thalassina* sp., Suyac Island, 25 January 2019.

The species was morphologically identified as *T. kelanang*, a new record from the Philippines, therefore, another sampling was undertaken. The second sampling was done only for one day through hand picking during the low tide. *Thalassina* was observed to surface before the water fully subsided, thus, was easily captured. A 100-meter transect line was laid seaward, perpendicular to the Island; start of transect 10°95'03.91"N 123°45'48.02" E, end of transect 10°95'04.51"N 123°45'39.70" E. Five meters on both sides of the transect line was then scanned for surfacing mud lobsters. Two additional male specimens were caught during the sampling. One mound was excavated to acquire an additional specimen but the hole was vertically directed downwards, reaching more than a meter. Since the area is densely covered with century old mangroves, the root system has made the digging challenging. The excavation was stopped at 1 m deep so as not to cause further

disturbance on the mangrove trees. It would be convenient to catch the species with the use bamboo traps (Bedi and Primavera 2018), however, since the species is not yet exploited in the Island, we defer the use of the device to avoid potential overharvesting. Each specimen was measured for total length (TL) and carapace width (CW), preserved for further examination and kept at the Northern Negros State College of Science and Technology, Sagay City, Philippines.

RESULTS

Measurements

The three male mud lobsters measured: 16.5 cm TL, 4.5 cm CW; 17.5 cm TL, 4.5 cm CW; 11.0 cm TL, 2.4 cm CW.

Habitat

The mounds ranging from 5-15 cm in heights scattered all over the sandy mangrove forest of Suyac Island. These mounds were more than a meter deep but the exact depth was not determined to avoid disturbance on mangrove roots.

Species Description

Carapace oval-shaped, bearing a visible and deep gastric region; connected to the linea thalassinica (Figure 1A). Linea thalassinica smooth, without spines on the dorsal aspect. Branchiostegal spines short, sharp, rigid; pointing anteriorly. Dorsal median margin of the carapace protrudes like a spine but does not reach the first abdominal tergite. Left cheliped larger than the right in all male specimens. Both dactyls double the length of the fixed finger, lined with small blunt spines. Adrostral carinae more than half the length of gastro-orbital carinae. Median sulcus deep, runs through the rostrum, and extends posteriorly, nearly the same length but behind the adrostral carinae (Figure 1B). First abdominal somite narrow, small, and with distinct inverted Y-shaped groove on the dorsal tergite (Figure 1C). The base of the second abdominal somite with visible sternal ridge having 3-6 teeth (Figure 1D). Petasma, the male copulatory organ is slender with pointed tip, half of the distomesial lobe bears hooklets in the proximal area and distally triangular. The proximal lateral margin of the petasma bears three conspicuous spines (Figure 1E). These morphological characteristics are consistent with the descriptions of *T. kelanang* (see Moh and Chong 2009; Sakai and Türkay 2012; Lin et al. 2016).

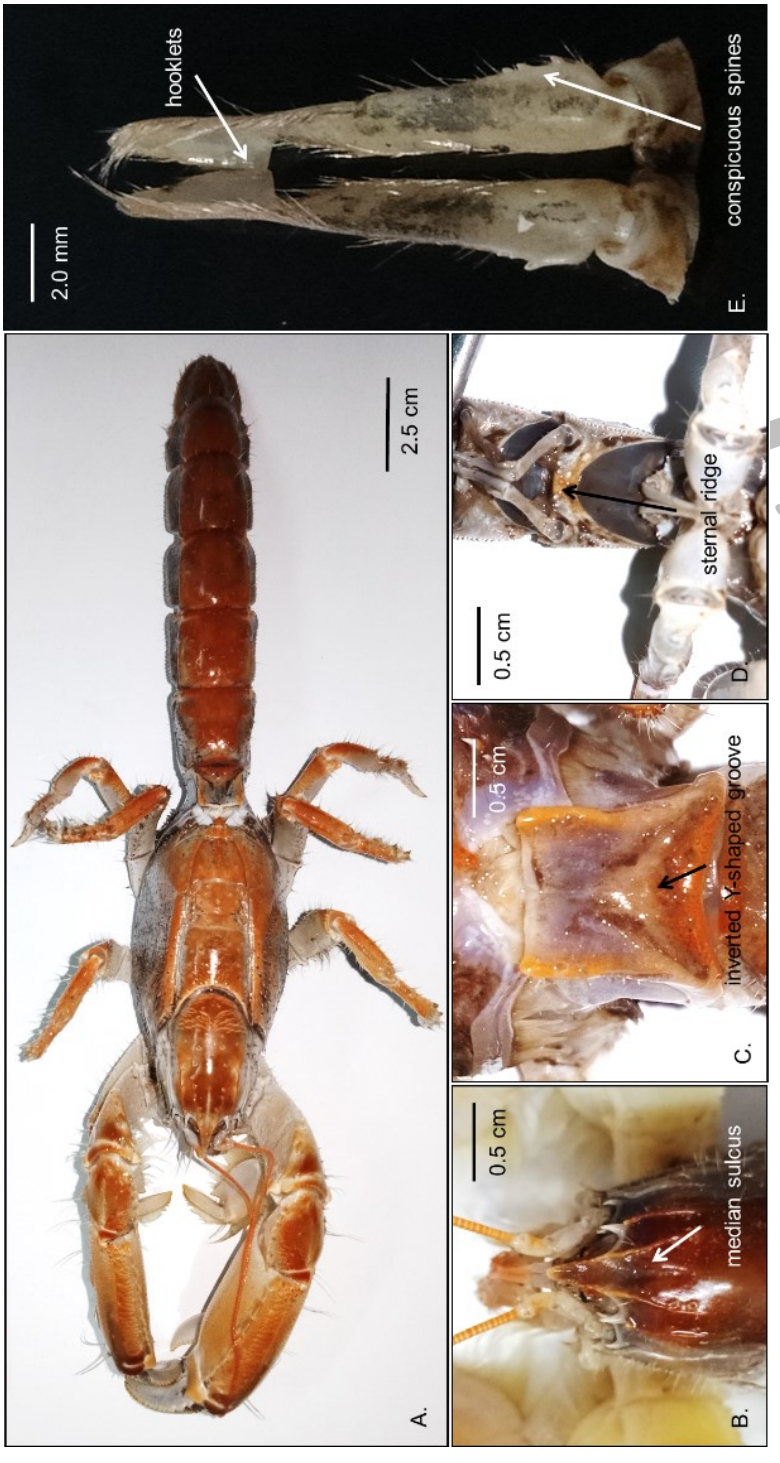

Figure 1. Dorsal view of male *Thalassina kelanang* collected from Suyac Island, Sagay City (A), anterior region of cephalothorax showing the position of rostral carinae (B), dorsal view of the first abdominal somite (C), ventral view of the second abdominal somite showing sternal ridge having 3-6 teeth (D), ventral view of the petasma (E).

DISCUSSION

The mud lobsters from Suyac Island were identified as *T. kelanang* as they fit the descriptions of Moh and Chong (2009), Sakai and Türkay (2012) and Lin et al. (2016). The species differ from *T. anomala*, a common species in the Philippines and mainland Negros Occidental, in many distinctive features such as rostrum, chela, carapace and somites. The rostrum of *T. anomala* is pointed; both chelae are smaller but with similar sizes; and its carapace has a dorsal median process which protrudes like a spine, reaching the first abdominal tergite. In *T. kelanang*, the rostrum is obtuse; chela is larger on one side; and the dorsal median process does not reach the first abdominal tergite. The first abdominal tergite of *T. kelanang* has inverted Y-shape groove rather than V-shape in *T. anomala* (Moh and Chong 2009). Although *T. kelanang* appears to be more similar to *T. squamifera* (Moh and Chong 2009), there are two major features that differentiate the species. These features are the rostrum and the petasma (in males) which are both agreed by Moh and Chong (2009) and Lin et al. (2016). On the contrary, Sakai and Türkay (2012) noted that the key difference can only be observed in the petasma. The latter have shown in their illustrations that median sulcus of *T. squamifera* extends behind adrostral carinae, similar to *T. kelanang*; which is contrary to that described by the two above-stated authors that median sulcus of *T. squamifera* does not extend behind adrostral carinae. Therefore, it is important to give more attention on the petasma when examining between these two species. The petasma of *T. kelanang* is slender while it is broad in *T. squamifera*; both species have hooklets in the proximal half of the distomesial lobe, but the lobes are distally triangular and distally rounded, respectively (Moh and Chong 2009; Sakai and Türkay 2012; Lin et al. 2016). Moh and Chong (2009) and Lin et al. (2016) also agreed that *T. kelanang* has 3-4 conspicuous spines at the proximal lateral margin of the petasma, but none in *T. squamifera*. While this characteristic was not mentioned by Sakai and Türkay 2012, their illustration of petasma (Figure 11 on Sakai and Türkay 2012) of *T. squamifera* does not exhibit any conspicuous spines proximally. This paper however considered all of those features that differentiated *T. kelanang* from *T. anomala,* a widely distributed species in the Philippines, and from *T. squamifera*, a closely similar species. The three specimens of *T. kelanang* was identified based on their deep median sulcus that extend behind the adrostral carinae, and slender petasma. The distomesial lobe of the petasma has hooklets in the proximal area and triangularly-shaped distally. Three conspicuous spines are also present at the proximal lateral margin making it easily distinguishable from *T. squamifera*.

The mounds of *T. kelanang* in Suyac Island were smaller compared to those of *T. anomala* that can reach more than a meter in height (Malley 1977). The mounds were rather similar to those of *T. kelanang* from Malaysia (Moh and Chong 2009; Moh et al. 2015) for having heights ranging between 5 and 15 cm, and basal diameter of about 21-38 cm. *Thalassina* spp. are nocturnal

diggers or become active at twilight, with most of their mounds closed during the day (Dubey et al. 2012; Nur-Nadiah et al. 2019). However, *T. kelanang* collected from Suyac Island was found actively burrowing its mound around 14:00 in the afternoon. This may suggest a different burrowing behavior among Thalassinidae. *Thalassina* also rebuild their disturbed mounds but particular time is not confirmed (Hossain et al. 2019).

There are possible factors which affect the common distribution of *T. kelanang* in sandy and *T. anomala* in muddy substrates which may provide evidence of their adaptive mechanisms in these environments. Nevertheless, the discovery of this species in the Philippines corroborates the statement of Moh et al. (2015) suggesting that the species is widely distributed in the Southeast Asian Region. Although *T. kelanang* was never observed in the mainland of Negros Occidental, it was previously reported to cohabit with *T. anomala* (Moh and Chong 2009) in Malaysia which may suggest the same in the Philippines. Observations may be conducted on the occurrence of *T. kelanang* in Negros Island to determine its ecosystem connectivity (e.g. egg dispersal among group of islands). These observations may provide insights on the mangrove ecosystem connectivity between the islands since mud lobsters are often found below ground. A thorough assessment might be done to unveil the rich diversity of *Thalassina* in the Philippines.

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