

Additional note on the mysid *Rhopalophthalmus hastatus* Hanamura, Murano and Man, 2011 (Crustacea: Mysida: Mysidae) from Songkhla Lagoon, southern Thailand

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ABSTRACT

The mysid *Rhopalophthalmus hastatus* Hanamura, Murano and Man, 2011 was collected from the shallow zone of the Thale Sap Songkhla, Songkhla Lagoon, southern Thailand on 18 November 2018. Specimens are described and illustrated using material collected by hand with a Riley push net. *Rhopalophthalmus hastatus* is characterized by the presence of one large spine, one mesial, two small spines on the antennal sympod, antennal scale slightly overreaching the end of the antennular peduncle, carpopropodus of the fourth to seventh thoracic endopods composed of six articles, two red chromatophores on the telson and lateral margin of the apical spine forming sharp spine-like process. This species was found in the shallow zone of the Songkhla Lagoon with brackish water and muddy substratum.

KEYWORDS

Mysidae, Rhopalophthalminae, Southeast Asia, taxonomy, Thale Sap Songkhla

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INTRODUCTION

The mysid genus *Rhopalophthalmus* was established by Illig (1906) with *Rhopalophthalmus flagillipes* Illig, 1906 as its type species from Congo, Africa. To date, 25 species of the genus have been identified, described and validated from various habitats throughout the world (Mees and Meland, 2012). In Southeast Asia, a total of seven species of the genus *Rhopalophthalmus* have been reported from these waters (O.S. Tattersall, 1960; 1965; Fukuoka and Murano, 2002; Hanamura et al., 2011; Tan and Azman, 2017) and four of them can be found in Thailand waters (W.M. Tattersall, 1921; Murano, 1988; Fukuoka and Murano, 2002; Hanamura et al., 2011).

To date, five scientific papers about mysid shrimps from the Songkhla Lagoon have been published based on their taxonomy and ecology. The first study was conducted by W.M. Tattersall (1921) in this lagoon with two species, *Nanomysis siamensis* W.M. Tattersall, 1921 and *Rhopalophthalmus egregius* Hansen, 1910. Since the first work by W.M. Tattersall (1921), another species of mysid, *Deltamysis songkhlaensis* (Yolanda, Sawamoto and Lheknim, 2019) (previously included in the genus *Heteromysoides* Băcescu, 1968) was described and named after this lagoon (see Yolanda et al., 2019; Daneliya, 2021). In 2022, the resident mysid (*Nanomysis siamensis*) was redescribed from this lagoon (Yolanda et al., 2022). From the ecological aspect, preliminary information about the abundance and occurrence of the mysids in the Songkhla Lagoon (*Mesopodopsis tenuipes* Hanamura, Koizumi, Sawamoto, Siow and Chee, 2008, *N. siamensis* W.M. Tattersall, 1921, and *Rhopalophthalmus hastatus* Hanamura, Murano and Man, 2011) was reported by Lheknim and Yolanda (2020). In addition, the population structure and reproductive biology of *N. siamensis* has been documented from this lagoon (Yolanda and Lheknim, 2021). During our survey of mysidaceans in the Songkhla Lagoon, *R. hastatus* was found and our observations, based on its morphological characteristics and variation, are reported.

MATERIALS AND METHODS

Specimens were collected from the shallow zone of Thale Sap Songkhla Lagoon System, southern Thailand, using a Riley hand push net (Yolanda et al., 2019; 2022). The specimens were transported to the laboratory at the Prince of Songkla University for identification and were identified following Hanamura et al. (2011). Identification was later confirmed by Dr. Yukio Hanamura and Prof. Shozo Sawamoto. Terminology follows W.M. Tattersall and O.S. Tattersall (1951) and Wittmann et al. (2014). Illustrations were made using a camera lucida with an ocular micrometer. Specimens were stored in 70% ethanol and deposited in the Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkla University in Hat Yai, Songkhla, Thailand.

SYSTEMATICS

Order Mysida Boas, 1883

Family Mysidae Haworth, 1825

Subfamily Rhopalophthalminae Illig, 1906

Genus *Rhopalophthalmus* Illig, 1906

Rhopalophthalmus hastatus Hanamura, Murano and Man 2011 (Fig. 1)

Rhopalophthalmus hastatus Hanamura et al., 2011: 8–13, figs. 4–7.

Material examined. Two adult males (BL 9.0 [not dissected], 10.1 mm [dissected]) and two ovigerous females (BL 11.5 mm [not dissected], 11.8 mm [not dissected]), PSUZC 20181118-10.01, Thailand, Ban Khok Rai, Tambon Pawong, Muang Songkhla District, Songkhla Province, Thale Sap Songkhla, 07°9'48.71"N 100°34'28.17"E, muddy substrate, shallow zone, 18 Nov 2018, N. Tubtintong, R. Yolanda and V. Lheknim coll.

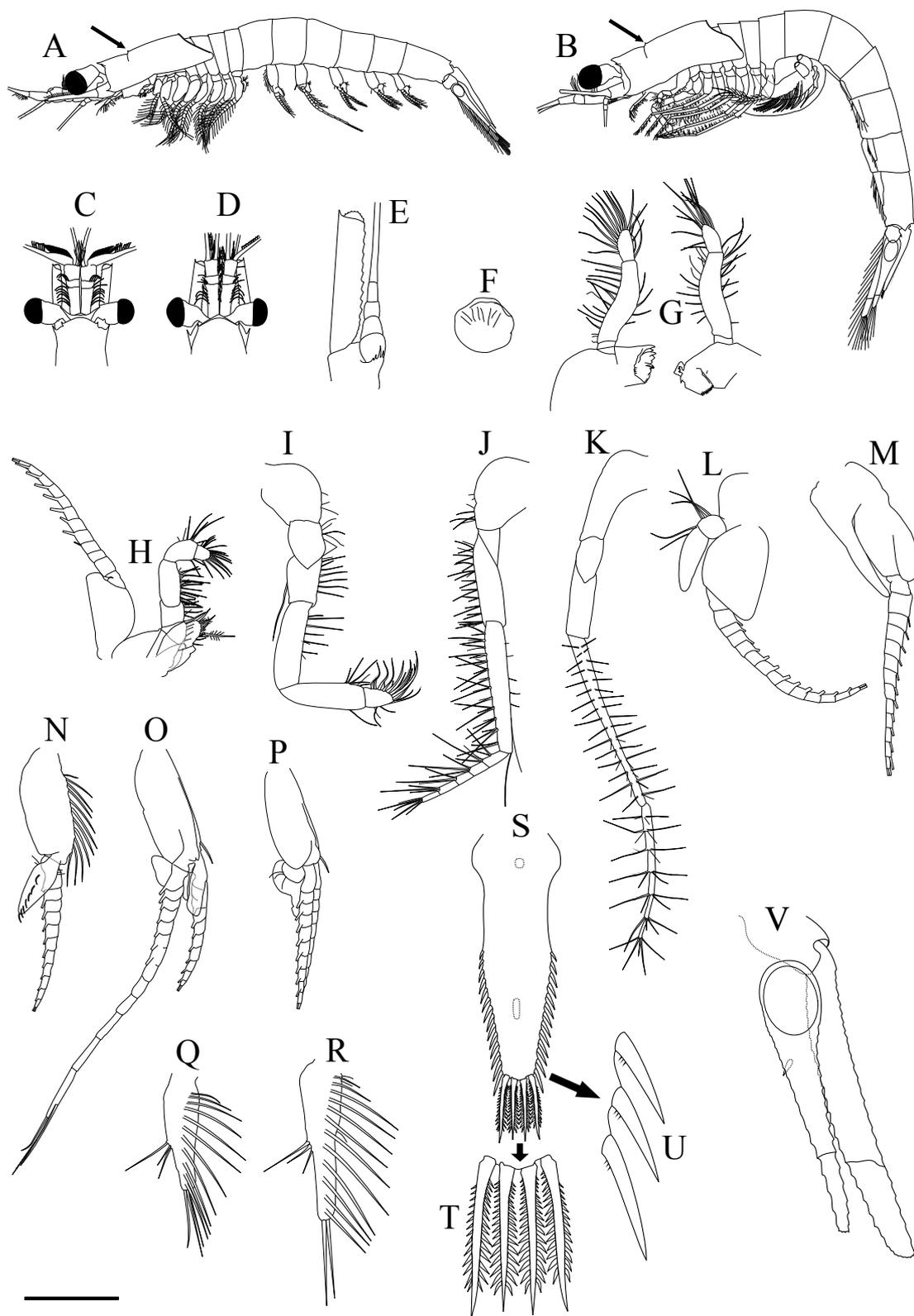


Figure 1. *Rhopalophthalmus hastatus* Hanamura, Murano and Man, 2011 from Songkhla Lagoon, southern Thailand. Adult male (BL 9.0 mm, **A, C, E**; BL 10.1 mm, **G–L, N–P, S–V**), ovigerous female (BL 11.5 mm, **B, D**; BL 11.8 mm, **F, M, Q, R**) (PSUZC 20181118-10.01). **A, B**. Habitus, lateral view; **C, D**, anterior part, dorsal view; **E**, antennae, ventral view; **F**, labrum, ventral view; **G**, mandibles with palps, ventral view; **H**, right first thoracopod; **I, J**, right second and third thoracopodal endopod; **K**, right seventh thoracopodal endopod; **L, M**, right eighth thoracopods; **N–P**, right first, second and fifth pleopods; **Q, R**, right fourth and fifth pleopods; **S**, telson, ventral view; **T**, apical spines enlarged; **U**, posterior spines armed with three small spinula; **V**, right uropod, dorsal view. Scale bar: 2 mm (**A–D**); 0.6 mm (**E–G**); 0.5 mm (**H–S, V**); 0.3 mm (**T**); 0.1 mm (**U**).

Diagnosis. Body smooth, without hairs, spines or folds, ventral sternites without process; first 5 somites sub-equal in length, sixth somite slightly longer than fifth. Eyes sub-pyriform with well-developed cornea occupying 1/3 of whole eye and width slightly wider than eyestalk. Anterior part of carapace short, produced as sub-triangular process with pair of postorbital spines on dorsal keels. Pair of nodules present at posterior 2/3 of carapace, in lateral aspect. Antennular peduncle with 3 articles, female more slender than male, armed with several long curving setae along lateral to distal margins, male lobe well developed with long dense setae. Antennal scale long and narrow, outer margin naked with strong outer distal spine and distal suture, sympod armed with 2 short spines, 1 mesial spine and 1 strong spine. Labrum sub-globular in shape. First thoracopodal endopod (maxilliped 1) short and basis well developed. Second thoracopodal endopod (maxilliped 2) stout. Carpopropodus of third to seventh thoracic endopods composed of five to six articles, eighth endopod reduced in size showing pronounced sexual dimorphism. Pleopods in male biramous, second exopod elongated and armed at distal end with modified setae, while uniramous in female and size gradually increasing to last pleopod. Uropods two segmented in first 1/3, endopod with single stout spine below statocyst. Telson linguiform, entire with lateral margin armed distally with row 13–14 sharp spines increasing in length posteriorly and bearing 3 small spines, posterior margin bearing 4 long setae, armed with several small sharp spines on margin.

Type locality. Merbok mangrove estuary, Malaysia (Hanamura et al., 2011).

Habitat and Distribution. This species is known from Merbok and Matang mangrove estuary, Malaysia; Khlong Donsak estuary (Hanamura et al., 2011) and Songkhla Lagoon, Thailand (Yolanda, 2021; this study) (see Fig. 2).

Remarks. The mysid *R. hastatus* is very close to its ally congeners, *R. egregius* and *R. orientalis*, but, the first species can be distinguished from the other two based on the following characteristics: *Rhopalophthalmus*

hastatus - 1) possess one large spine, one mesial spine, and one to three small spines on the antennal sympod; 2) the antennal scale slightly overreaching the end of the antennular peduncle; 3) carpopropodi of the seventh thoracic endopod composed of six or seven articles; 4) two red chromatophores on the telson but the posterior one smaller than in *R. egregius*; 5) lateral margin of the apical spine forming sharp spine-like process. *Rhopalophthalmus egregius* - 1) possess three or four large spines and two small spines on antennal sympod; 2) the antennal scale slightly overreaching the end of the antennular peduncle; 3) carpopropodi of the seventh thoracic endopod composed of five articles; 4) two red chromatophores on the telson; 5) lateral margin of apical spine forming leaf-like process or sharp spine. *Rhopalophthalmus orientalis* - 1) possess two large spines and two small spines on antennal sympod; 2) the antennal scale barely reaching the end of the antennular peduncle; 3) carpopropodi of the seventh thoracic endopod composed of five articles; 4) one red chromatophore present at the mid-anterior of telson or sometimes without chromatophore; 5) lateral margin of apical spine forming leaf-like process (Hanamura et al., 2011).

Morphological observation of *R. hastatus* from the Songkhla Lagoon shows a little variation from the original description by Hanamura et al. (2011). In our specimens, there is a small nodule right after the cervical sulcus (see arrows in Fig. 1A, B), while there is no nodule in the original description (Hanamura et al., 2011). Variation in the occurrence of this small median nodule in the group Rhopalophthalminae is also found in other species, for example, the small nodule in *R. egregius* from the Zoological Museum of Copenhagen University was absent/less developed, meanwhile, a well-developed anterior nodule was present from Southeast Asia specimens (Hanamura et al., 2011). Similarly, the specimens of *R. longipes* from Malaysia also bear a median small nodule (Tan and Azman, 2017), meanwhile the specimens from Japan are without this nodule (Ii, 1964). Interestingly, we didn't find any *R. egregius* or *R. orientalis* in this lagoon as previously mentioned by W.M Tattersall (1921). We expect that our findings may contribute to the diversity of Mysidacea in the Songkhla Lagoon.

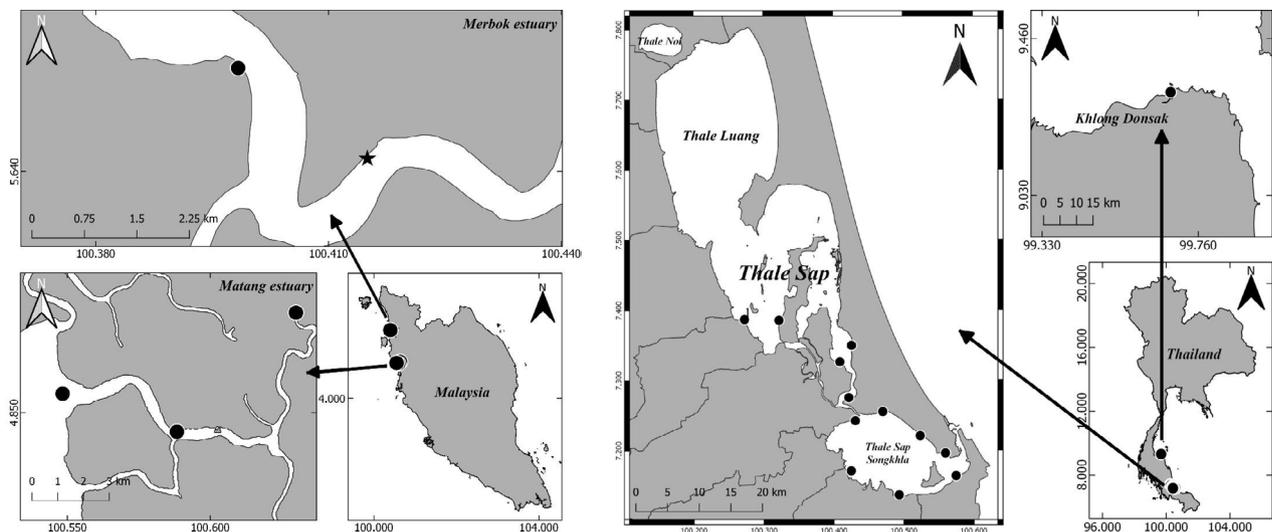


Figure 2. Distribution of *Rhopalophthalmus hastatus* Hanamura, Murano and Man, 2011 in Malaysia [Merbok estuary (black star, indicates holotype specimen collected) and Matang estuary (black dots)] and Thailand [Khlung Donsak (black dot) and Songkhla Lagoon (black dots)]. Sources: Hanamura et al. (2011), Yolanda (2021) and present study.

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ADDITIONAL INFORMATION AND DECLARATIONS

Author Contributions

Samples collection: RY, VL. Preparation of figures and map: RY. Manuscript preparation & editing: RY, RS, VL.

Consent for publication

All authors declare that they have reviewed the content of the manuscript and gave their consent to submit the document.

Competing interests

The authors declare no competing interest.

Data availability

All study data are included in the article and available on request from the corresponding author. All specimens are

deposited in the Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkla University in Hat Yai, Songkhla, Thailand.

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Study permits

Not applicable.