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Three New Records of Gammarid Amphipod in Songkhla Lake, Thailand

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Abstract: Songkhla Lake is known as the most popular area for gammarid amphipod studies in the Gulf of Thailand. The first gammarid amphipod study was investigated in 1925 by Chilton. After that, there are various studies including diversity, ecology, and biology. In this study, gammarid amphipod in Songkhla Lake were collected from year 2010 to 2014. In this study, three newly recorded amphipods had been reported namely *Hyale dollfusi* Chevreux, 1911, *Grandidierella megnae* (Giles, 1888), and *Hourstonius japonica* (Hirayama, 1983) which had not been previously reported from the Thai waters. The gammarid amphipods had been catalogued. Their characteristics had been described and illustrated. All specimens were deposited at Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkla University, Thailand.

Keywords: Amphipod, Songkhla Lake, New Records

INTRODUCTION

Songkhla Lake is the largest natural lagoon located in southern of Thailand. The lake contains brackish water and the salinity varies by season from 0–30 psu. Songkhla Lake covers an area of 1,042 km^2, is divided into three parts: the upper, middle, and lower Songkhla Lakes. There are varieties of ecosystems including mangrove forest, estuary, mud flat, and wetlands. It is not only important as habitats for aquatic organisms but also for human uses i.e. fisheries, aquaculture, and recreation place.

Amphipod is one of major benthic fauna group, which plays an important role in trophodynamics (De Broyer *et al.* 1999). In Songkhla Lake, amphipod was reported as a major food for Spotted Catfish (*Arius maculatus*), a common economic fish in this area (Angsupanich *et al*. 1999). Amphipod diversity study has been carried out since 1925 by Chilton. Chilton (1925) had reported 12

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species of amphipods from 11 genera. Following to that, amphipods diversity studies were investigated in separate areas of Songkhla Lake. Currently, the total number of amphipod in Songkhla Lake is 28 species from 20 genera. From that, 13 species from 13 genera were reported from upper Songkhla Lake (Ruensirikulet *et al.* 2007), nine species from eight genera and nine species from nine genera were reported from middle and lower Songkhla Lake respectively (Bussarawich 1985; Angsupanich & Kuwabara 1995; Ariyama *et al.* 2010; Wongkamhaeng *et al.* 2013). This study aims to gain knowledge of marine amphipod diversity in Songkhla Lake.

MATERIALS AND METHOD

Amphipods were collected from different substrates namely algae, mud, debris, and wood in lower and middle Songkhla Lake during 2010–2014 (Fig. 1). The upper Songkhla Lake was not included in this study which focused on marine amphipod. The samples were collected in plastic bags and washed through an 0.5 mm mesh sieve. The remaining amphipod specimens were sorted, fixed in 4% formalin for one week, and then stored in 70% alcohol. In the laboratory, the specimens were examined using a compound microscope and later selected for dissection. The appendages were examined and illustration was produced using an Olympus CH30 light microscope with a camera lucida. The following abbreviations are used: A, antenna; G, gnathopod; HD, head; LL, lower lip; MD, mandible; MX, maxilla; MP, maxilliped; P, pereopod; Pl, pleopod; T, telson; U, uropod; UR, urosome; UL, upper lip; r, right; l, left; ♂, male; ♀, female. The material are deposited at Prince of Songkla University Zoological Collection (PSUZC).

RESULTS

Family Amphilochidae
Hourstonius japonica (Hirayama, 1983) (Fig. 2).
*Gitanopsis japonica (*Hirayama, 1983: 125).
Material examined: Lower Gulf of Thailand, Songkhla Lake (7°9'55"N 100°32'14"E) 21 July 2014. Wongkamhaeng, K. PSUZC-CR-0184 (1♂; 12♀).
Type locality: West Kyushu, Japan.
Distribution: Northwest Pacific and Songkhla Lake, Thailand (current study).
Discussion: The material in this study is similar to the original description of Hirayama (1983) except the dactylus of gnathopod 1 is curved and smooth while those of Hirayama's is serrate on grasping margin.

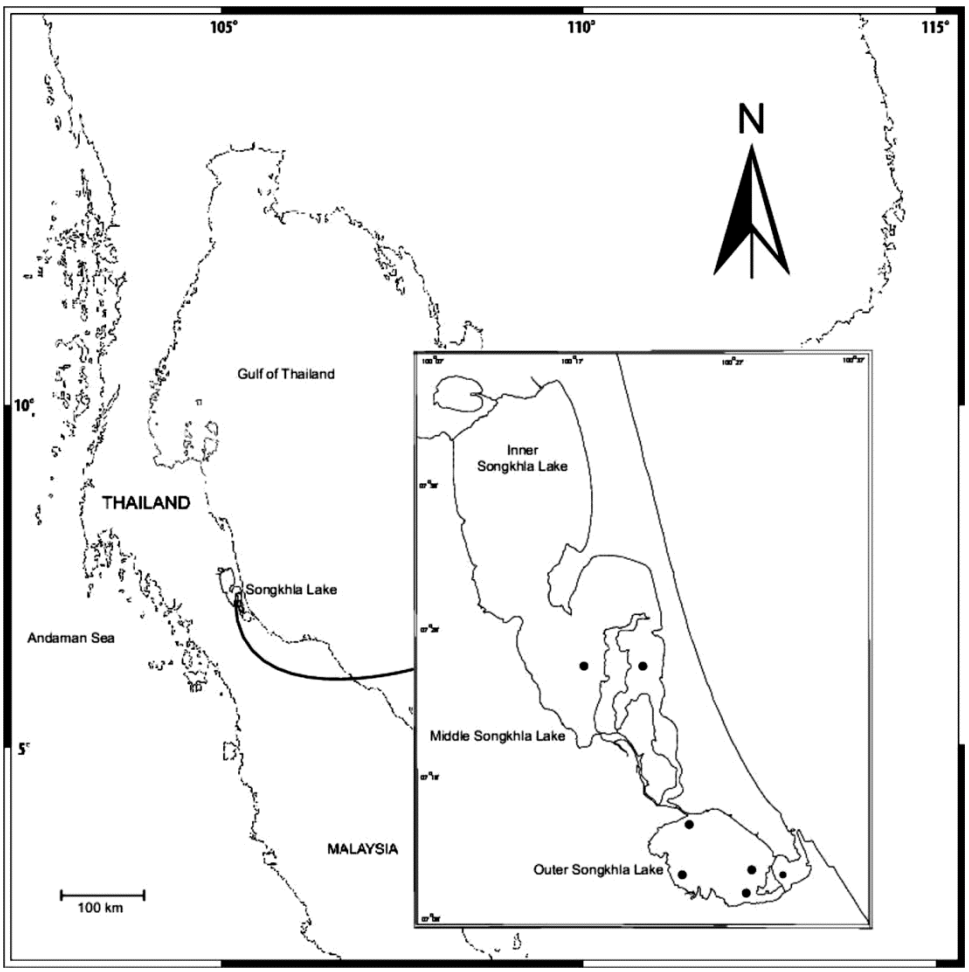

Figure 1: Map of Songkhla Lake and the study sites.

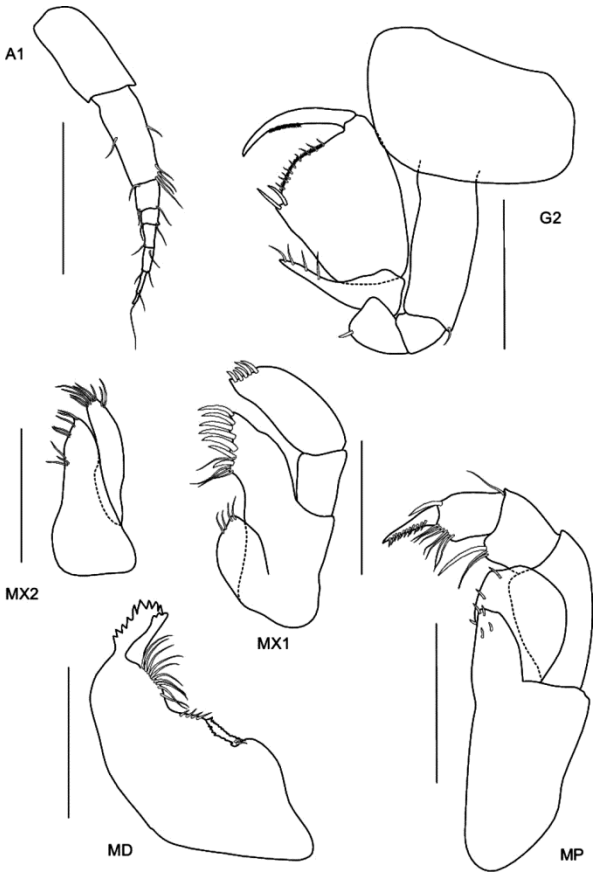

Figure 2: *Hourstonius japonica* (Hirayama, 1983).
Notes: Scale bars for A1 and G2 represent 0.5 mm; for MX1, MX2, MD, and MP is 0.1 mm.

Family Aoridae
Grandidierella megnae (Giles, 1888) (Fig. 3).
Microdeutopus megnae (Giles, 1888: 231, pl. 7, fig. 14).
Grandidierella megnae (Tattersall, 1922: 455, pl. 19, fig. 1–12; Asari & Myers, 1982: 243, figs. 3–4).
[non *Grandidierella megnae* Chilton, 1925: 535, fig. 2].
Material examined: Lower Gulf of Thailand, Songkhla Lake (7°9'55"N 100°32'14"E), 22 September 2010, Puttapreecha, R. PSUZC-CR-0185 (1♂; 5♀).
Type locality: Indian Coast.
Distribution: India and Songkhla Lake, Thailand (current study).
Discussion: The original description of Giles (1888) was brief and hard to compare with present material. However, it resembles the description and figure of Asari and Myers (1982) in India except the shape of carpus male gnathopod 1 slightly posteriodistally produced while Indian specimens are strongly produced.

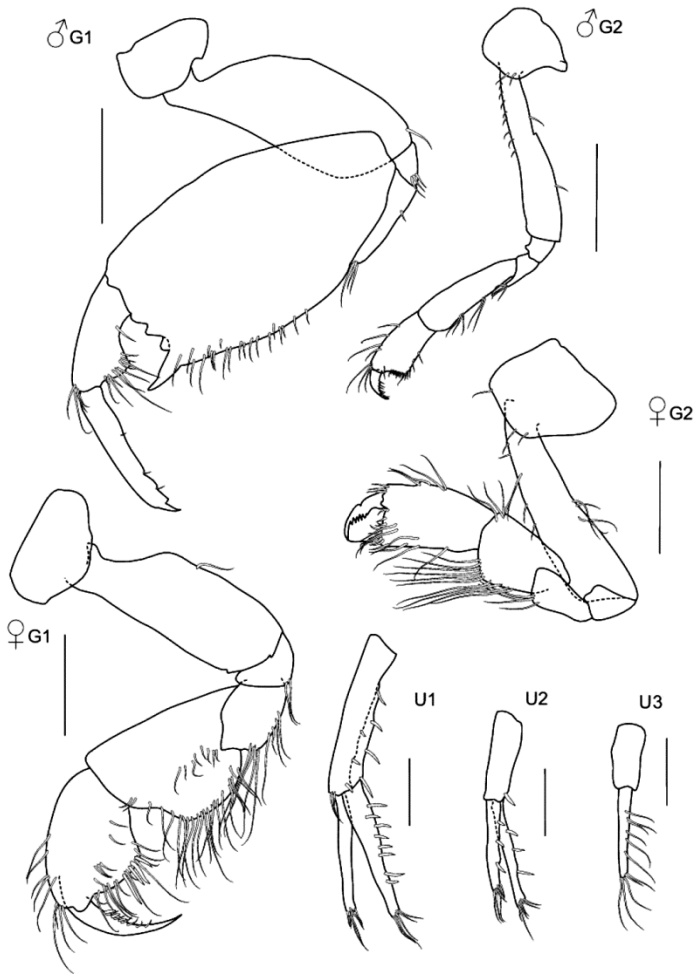

Figure 3: *Grandidierella megnae* (Giles, 1888).
Notes: Scale bars for ♂♀ G1 and G2 represent 0.5 mm; U1–3 represent 0.1 mm.

Family Hyalidae
Hyale dollfusi (Chevreux, 1911) (Figs. 4–5).
Hyale dollfusi (Chevreux, 1911: 238, pl. 16, figs. 13–19. Chevreux & Fage, 1925: 287, fig. 298. Iwasa, 1939: 280, fig. 18, pl. 18. Ren *et al*. 2012, pl. 27, fig. 10).
Material examined: Lower Gulf of Thailand, Songkhla Lake (7°9'55"N 100°32'14"E), 22 October 2012, Buatip, S. PSUZC-CR-0186 (5♂; 15♀).
Type locality: Tunisia.
Distribution: Mediteranean Sea, Northwest Pacific, China Sea and Songkhla Lake, Thailand (current study).

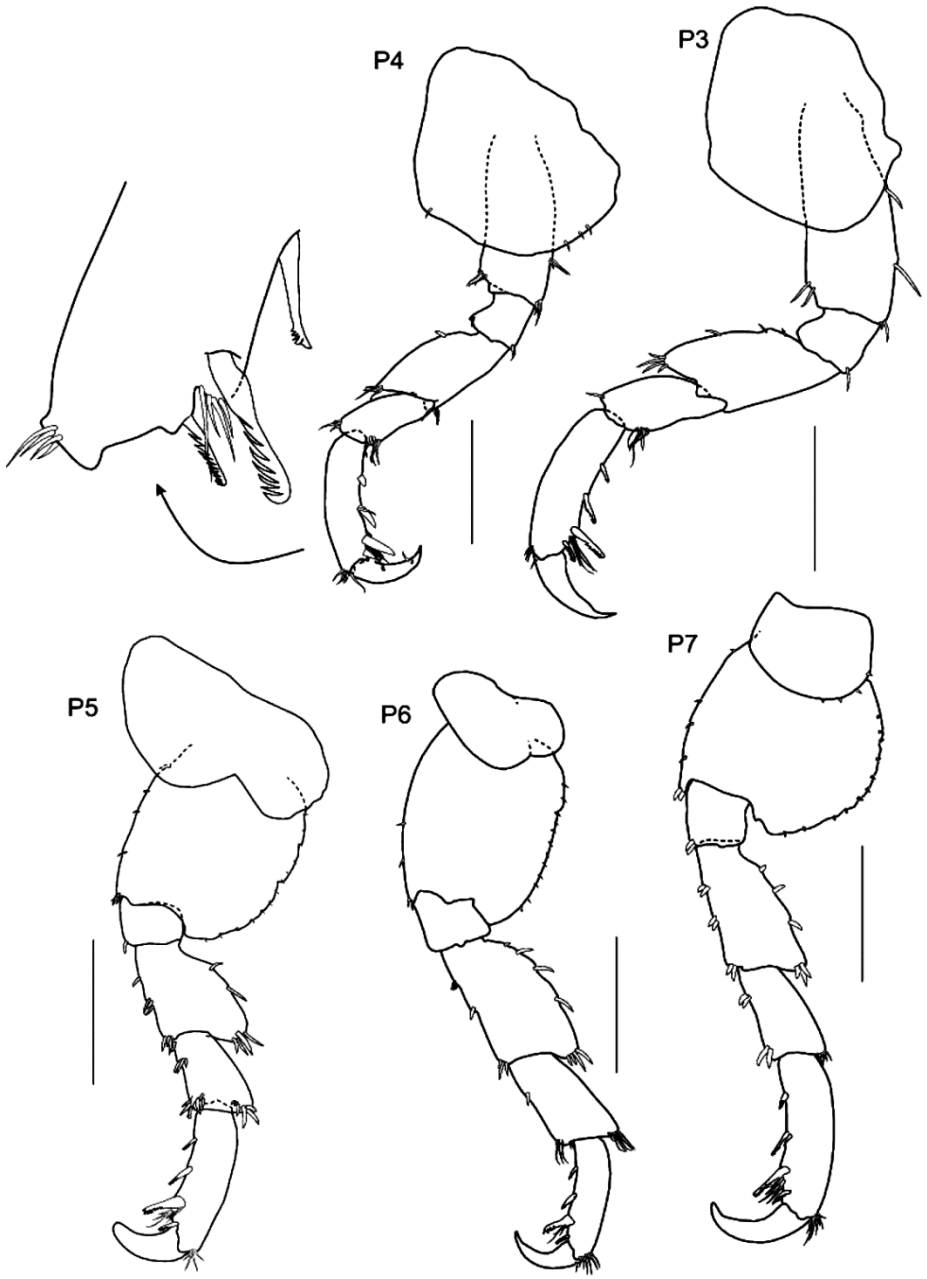

Figure 4: *Hyale dollfusi* (Chevreux 1911) (Giles, 1888).
Notes: Scale bars for A1, A2, G1, and G2 represent 0.5 mm; U1–3 represent 0.1 mm.

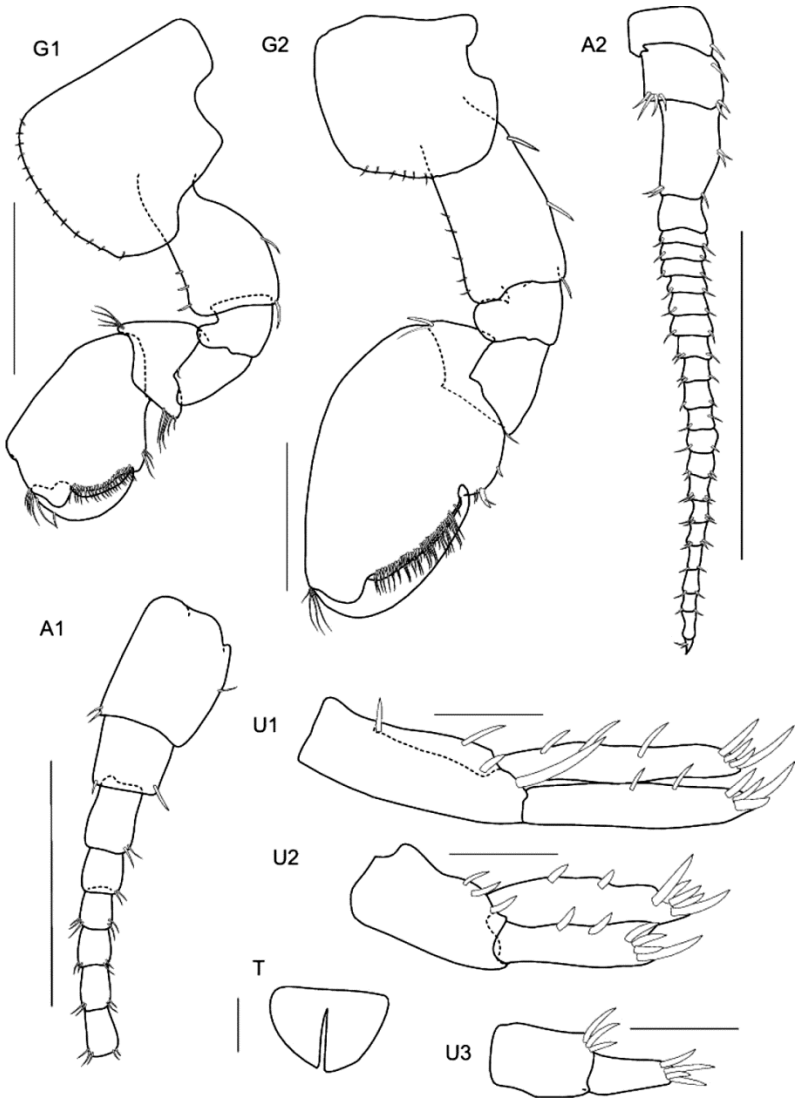

Figure 5: *Hyale dollfusi* (Chevreux 1911).
Note: All Scale bars represent 0.5 mm.

DISCUSSION

Our specimens are similar to the original description of Chevreux (1911) in Mediterranean Sea except uropods 3 rami subequal to peduncle while the original description shorter than peduncle and telson of Songkhla Lake amphipod is subglobular while the telson lobes of original description are point.

The amphipod diversity in Thailand coast recorded 77 species, in which 30 species has been recorded from the Gulf of Thailand mainly from Songkhla Lake. Most of them are soft bottom benthos which the aorids dominate the amphipod component. According to this report, there are other amphipod groups which are not investigated, i.e. the algal-dwellers, demersal scarvengers, commensals, and epiparasites. Further studies are needed to fulfill the whole picture of amphipod diversity in this area. All specimens were deposited at Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkla University, Thailand.

CONCLUSION

Although the diversity of gammarid amphipod in Songkhla Lake has been carried out for 90 years but the biodiversity of gammarid amphipod is still largely unknown. The discovery of these three new records represents the poorly information of amphipod in Songkhla Lake. According to this report, there are also other amphipod groups that have not been investigated, i.e. algal-dwellers, demersal scavengers, commensals, and epiparasites, all of which require more study in order to obtain a more holistic understanding of diversity in this area.

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