

First Record of Penaeid Shrimp *Metapenaeopsis gallensis* from Japanese Waters

Hideo Sakaji and Ken-Ichi Hayashi

Forty-two specimens of *Metapenaeopsis gallensis* (Pearson, 1905) were collected by a small beam trawl from Tosa Bay, southern Japan (33° 28' N, 133° 33' E). This is the first record of this species from Japanese waters, and shows the northernmost occurrence of its distribution. In the following three points, *M. gallensis* differs from the other *Metapenaeopsis* species which are characterized by the absence of the stridulating organ and their distribution in shallow areas in Japan. (1) The dorsal carina of the third abdominal somite is sulcate. (2) The thelycum has a pair of rounded processes with a median groove that runs longitudinally to the seminal receptacle between the fourth pereopods. (3) The anterior end of the left valve of the petasma has only one apical process. The color pattern of *M. gallensis* resembles *M. dalei* in marks and tint, but irregular red patches on the lateral part of the carapace and the abdomen are clearer in *M. gallensis* than in *M. dalei*. It is uncertain whether *M. gallensis* actually settles or not in Japanese waters because of the scarcity of its occurrence.

Key words: *Metapenaeopsis gallensis*, Penaeidae, first record, Japan

Twelve *Metapenaeopsis* species have been previously reported from Japanese waters (Crosnier 1987, 1991, 1994, Hayashi 1992). During the study of penaeid shrimps on the continental shelf of Tosa Bay, southern Japan (33° 28' N, 133° 33' E), we found some uncommon specimens of *Metapeneopsis* species which had no stridulating organ. The third abdominal somite and the genital organs also differed from those of the species known from Japanese waters. Their characteristic features led us to identify them with *M. gallensis* (Pearson, 1905). In order to confirm the identification of this species, we examined several specimens of *M. gallensis*, collected from New Caledonian waters and identified by Dr. Alain Crosnier (MNHN), for direct comparison. We present brief notes on this species as a new member of the Japanese fauna. The Japanese specimens examined are deposited at the Kochi Station of the Nansei National Fisheries Research Institute (KSNNFRI), Kochi and the National

Fisheries University (NFU), Shimonoseki, Japan, and the New Caledonian specimens at the Muséum national d'Histoire naturelle (MNHN), Paris, France.

Materials

Tosa Bay, off Kochi City, depth 35 m, 30 November, 1995, 16 ♀ (KSNNFRI, 6.4–10.4 mm in carapace length), 13 ♂ (KSNNFRI, 6.4–8.8 mm); depth 25 m, 13 December, 1995, 1 ♀ (NFU, 10.6 mm); depth 35 m, 13 December, 1995, 2 ♀ (NFU, 7.6–9.3 mm), 2 ♂ (NFU, 8.9–9.4 mm); depth 35 m, 8 February, 1996, 2 ♀ (KSNNFRI, 7.5–11.3 mm), 3 ♂ (KSNNFRI, 4.4–9.7 mm).

New Caledonia, NW Lagoon (20°12'S, 164°15'E), depth 22 m, 5 May, 1988, 3 ♀ (MNHN, 7.7–9.8 mm), 1 ♂ (MNHN, 7.1 mm).

Diagnosis

Rostrum straight, reaching slightly beyond first segment of antennular peduncle, armed dorsally with 6 or 7 teeth excluding epigastric spine. Middorsal carina of third abdominal somite prominent and grooved entirely. In both sexes, a pair of spines on sternum between second pereopods slender and sharply pointed and those between third pereopods short and rounded distally. Thelycum plate between fourth pereopods with setal margin; coxal plate of fourth pereopod not extremely large; a pair of spine-like process, each with longitudinal line, and median depression present between thelycum plate and transverse plate; transverse plate pointed anteriorly at outer ends with a shallow median incision; posterior plate pointed anteriorly by a broad rounded process at outer ends and with three small processes (Fig. 1 A). Petasma asymmetrical; anterior end of left valve ending in single apical process; right valve massive and as long as left valve (Fig. 1 B).

Discussions

In the genus *Metapenaeopsis*, twelve species have been reported from Japanese waters (Crosnier 1987, 1991, 1994, Hayashi 1992, Shinomiya and Sakai 1995). They are divided largely into two species groups by the presence or absence of the stridulating organ. The following seven species have this organ; *M. aegyptia*, *M. acclivis*, *M. barbata*, *M. dura*, *M. palmensis*, *M. sinica* and *M. toloensis*. The remaining five species are unfurnished; *M. dalei*, *M. lamellata*, *M. lata*, *M. mogiensis mogiensis*, *M. provocatria longirostris*. The present species, *M. gallensis*, newly obtained from Tosa Bay at depths of 25–35 m, is included in the latter group.

Of these, *M. lata* and *M. provocatria longirostris* represent a slender body form and usually found from continental slope (Crosnier 1987, Sakaji et al. 1994), while the remaining species including *M. gallensis* are found from shallow waters less than 100 m.

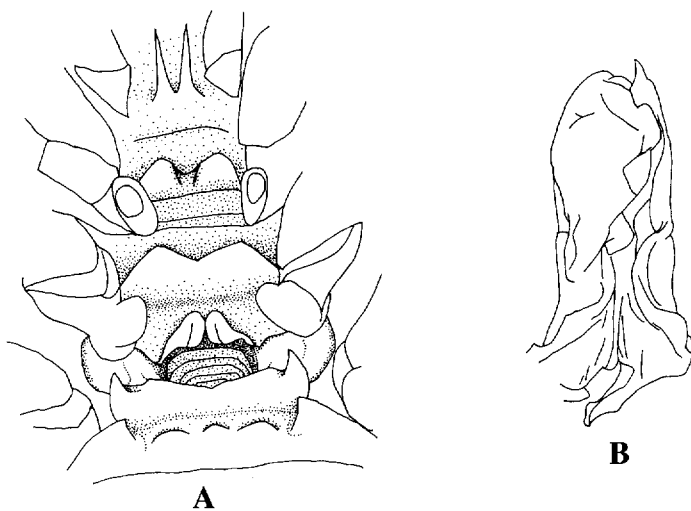


Fig. 1. Genital organs of *Metapenaeopsis gallensis*. Thelycum in ventral view, 11.8 mm in carapace length (A) and petasma in ventral view, 8.8 mm in carapace length (B).

First of all, *M. lamellata* has a unique, unusually short and high rostrum. *M. gallensis* differs from *M. dalei* and *M. mogiensis mogiensis* in having a dorsally grooved carina on the third abdominal somite, in contrast to the flat carina in the latter two species. The thelycum has a pair of teeth pointed anteriorly between the fourth pair of pereopods in *M. gallensis* and *M. mogiensis mogiensis*, while a pair of papilla-like processes in *M. dalei*. An intermediate groove runs longitudinally on the seminal receptacle in *M. gallensis* (Fig. 1 A), but no groove in *M. mogiensis mogiensis*. The anterior end of the left valve of the petasma has only one apical process in *M. gallensis* (Fig. 1 B), while some processes in *M. dalei* and *M. mogiensis mogiensis*.

Fortunately, these Japanese specimens were able to compare with four specimens of *M. gallensis* which have been collected from New Caledonia and classified by Dr. A. Crosnier (MNHN). Both materials are entirely the same in shape and size, except for a pair of rounded processes on the sternum of the third pereopods, which is less conspicuous in the Japanese females than in New Caledonian females.

Coloration is also important to distinguish *M. gallensis* from the other species, although almost all species are mottled pattern of dull brown, red

or purple. The color patterns of *M. mogiensis mogiensis* and *M. dalei* were already shown (Sakaji and Horikawa 1995). *M. gallensis* bears a resemblance to *M. dalei* in marks and tint, but red patches on the lateral part of the carapace and abdomen are clearer in *M. gallensis* than in *M. dalei* (Fig. 2).

From the zoogeographical view point, *M. gallensis* is widely distributed in the Indo-West Pacific region from the western part of the Indian Ocean to the West Pacific including Japan, through southeast Asia. On the other hand, *M. dalei* and *M. mogiensis mogiensis* have a rather restricted distribution, only known from Japan and its neighboring waters (Crosnier 1991). *M. lamellata* has a rather wide distributional range, from Australia northwards to Japan (Crosnier 1991).

Some species of *Metapenaeopsis* are important for coastal fisheries in Japan (Holthuis 1980). Because of the scarcity of the occurrence in number (Table 1), the commercial importance of *M. gallensis* seems to be low, and the permanent settlement in Japanese waters is very obscure like *Penaeus indicus* (Hayashi et al. 1992). *M. gallensis* appeared in Tosa Bay from October to March only (Table 1). Species diversity of Penaeidae reduces outside the 15°C isotherms at a minimum winter temperature (Dall



Fig. 2. Color patterns of *Metapenaeopsis gallensis* (right) and *M. dalei* (left).

Table 1. Number of *Metapenaeopsis gallensis* sampled from Tosa Bay from April 1995 to March 1996, showing the total number of *Metapenaeopsis*

Month	<i>M. gallensis</i>	<i>Metapenaeopsis</i> spp.
Apr-95	0	15,135
May-95	0	14,252
Jun-95	0	5,790
Jul-95	0	2,881
Aug-95	0	1,879
Sep-95	0	2,394
Oct-95	1	1,669
Nov-95	29	3,769
Dec-95	5	3,381
Feb-96	6	7,513
Mar-96	1	7,178
Total	42	65,841

et al. 1990), and Pacific coast of southern Japan near Tosa Bay is situated on the one of the isotherms. Therefore, it seems that larvae of *M. gallensis* were transported by the Kuroshio current from tropical waters, settled and stayed as a temporal resident in Tosa Bay.

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日本周辺水域における *Metapenaeopsis gallensis* の初記録

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1995年から1996年にかけての土佐湾の浅海域における小型底びき網漁船による調査で、10～3月に水深25mと35mから*Metapenaeopsis gallensis*が採集された。これは日本における本種の初めての記録であると同時に、最も高緯度水域からの記録でもある。本種は、次の形態的特徴から日本周辺に棲息する近縁種と区別することができる。(1)第3腹節の正中稜に溝がある。(2)thelycumの第4胸脚間に貯精嚢に向かって走る溝を持つ1対の棘を有する。(3)petasmaの左葉先端に1棘を持つ。本種の色彩はキシエビ*M. dalei*に類似しているが、不規則な赤い斑紋がより鮮明である。採集個体数が少ないことと採集された季節が限られていることから、本種の土佐湾における出現は無効分布の一例かもしれない。

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