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TWO SPECIES OF THE FRESH-WATER SHRIMPS FROM THAILAND

(With two Plates and four Figures in Text)

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Introduction

Recently the Board of the Crown Prince's Affair of Japan was kind enough to send to the writer some living specimens of the fresh-water shrimps of Thailand. According to the information from the Board these shrimps were found from among the fresh-water fishes which had been carried back for studies by the Crown Prince on the occasion of his good will visit to Thailand near the end of the year 1964, and kept alive in his palace, but no other data are known.

The preliminary notice of examinations of the shrimps was presented by the writer himself at the meeting of the Chugoku-Shikoku Branch of the Japanese Zoological Society in 1965, and after that the further studies of them are carrying out by the writer. The shrimps from Thailand contain six specimens representing two species, of which one species belongs to the Atyidae and the other the Palaemonidae. The writer intends to describe them in detail herein after.

Acknowledgements

The writer wishes to express his sincere thanks to the Crown Prince of Japan who has granted him to study the valuable and interesting materials, and he is also grateful to Mr. T. NAGAI of the Board of the Crown Prince's Affair and Mr. Y. HIROSAKI of the Enoshima Aquarium, Fujisawa City, Kanagawa Prefecture, for the trouble they kindly took to make the grant possible. Acknowledgement is also due to Dr. I. KUBO of the Tokyo Fisheries University and Dr. T. SAKAI of the Yokohama National University who have kindly offered facilities available for important literatures.

Family ATYIDAE

Genus **Caridina** H. MILNE-EDWARDS, 1837

Caridina laevis HELLER

(Pl. I ; text-figs. 1, 2)

Caridina laevis HELLER, 1862, Sitzungsber. der Kais. Akad. der Wissensch., Bd. 45, S. 411,

Wien (not read ; fide DE MAN, 1892). —— DE MAN, 1892, p. 376-379, pl. 23, figs. 27, 27a-27g.

Specimens examined. —— Two young females.

Dimensions. —— One is 12 mm and the other 13 mm in total length, viz., from the tip of the rostrum to the end of the telson, and hereafter the former is referred to as (A) and the latter (B). The length of the carapace excluding the rostrum is both 3 mm. The adult females of this species from Java (type locality), according to DE MAN (loc. cit.), are 25 or 26 mm in total length. The shrimps from Thailand are only half the size of the Javanese ordinary shrimps. The writer, therefore, regards them to be young ones, being not fully differentiated sexually as yet.

Colour in life. ——The colouration is light brown in an aquarium placed in a light room.

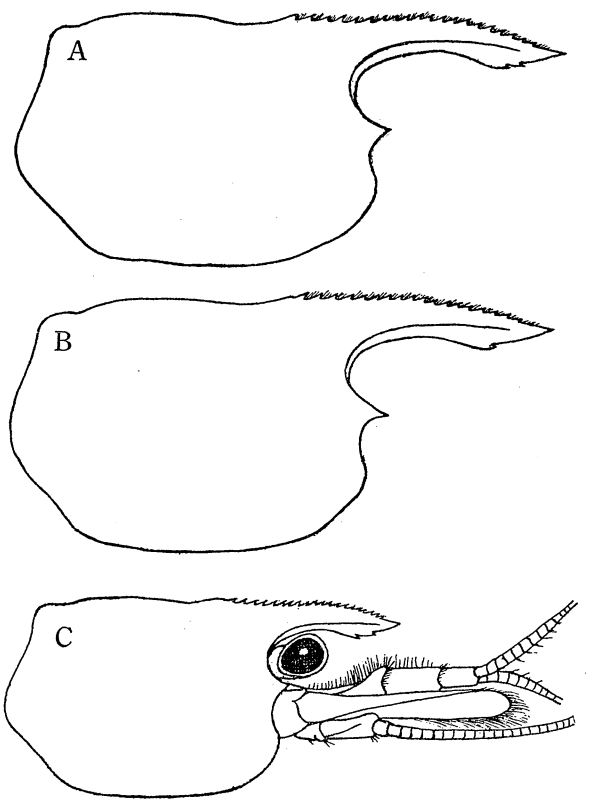

Fig. 1. *Caridina laevis* HELLER. A, B. Carapace with rostrum (×13), C. Anterior portion of cephalothorax (×10).

Rostrum.——It is rather short, slightly bending downward (Figs. 1 A, B), slightly passing the first segment of the antennular peduncle (A) (Fig. I C), or reaching to the middle of the second one (B) ; the dorsal border is somewhat bent, and provided with sixteen spines (A) or eighteen (B), of which the hinder four (A) or three (B) are situated on the carapace, the foremost is placed near the tip ; lower border is moderately convex and armed with two spines (A) or one (B) near the middle ; thus, the rostral formulae of the specimens are represented by such as —— 4+16 / 2 and 3+15 / 1.

In many Javanese specimens of the shrimp, according to DE MAN (loc cit.), the dorsal border of the rostrum is provided with 18 - 22 teeth in the adult and 14 - 17 in the juveniles, and the hinder teeth 3 - 4 are situated on the carapace; the lower borders of the rostra were armed with 3 spines. The rostrum usually reaches the tip of the second

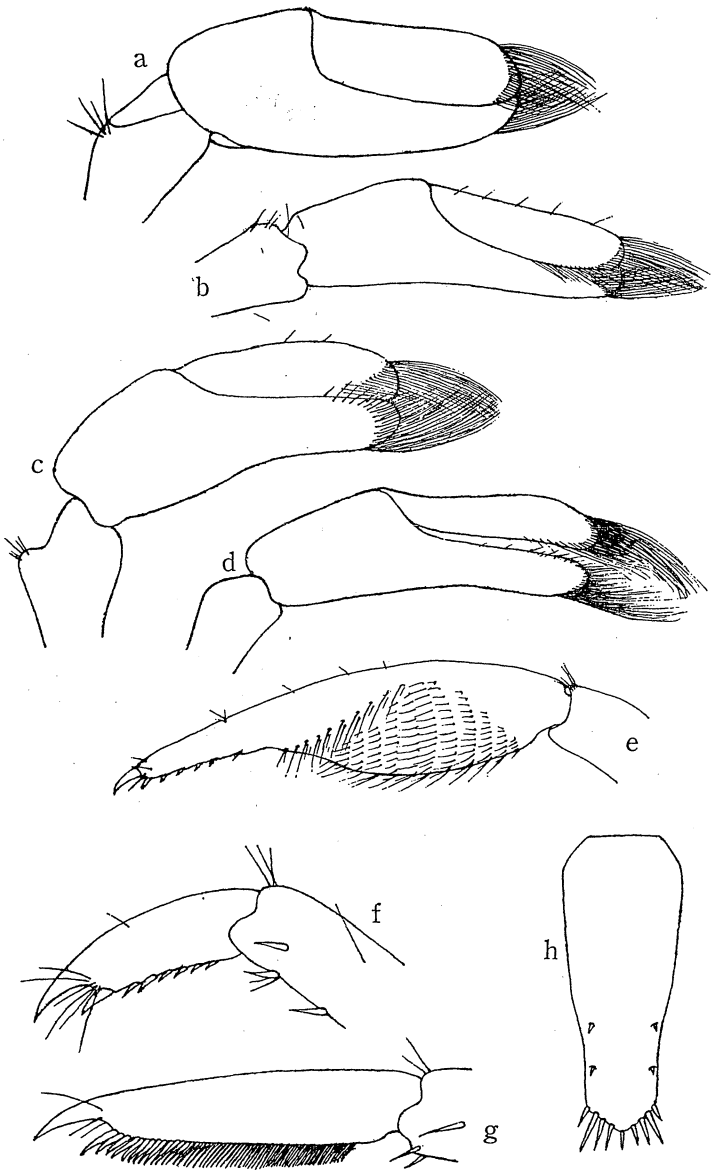

Fig. 2. *Caridina laevis* HELLER. a. First hand (× 7), b. Second hand (× 5), both figured from (A) specimen ; c. First hand (× 7), d. Second hand (× 5), both figured from (B) specimen ; e. Dactylus of third maxilliped (× 80), f. Same of penult (× 130), g. Same of last leg (× 90), h. Telson (× 19).

segment of the antennular peduncle or middle of the third, but in very young specimens at the writer's disposal from Thailand it reaches the tip of the first segment of the peduncle.

Telson. —— The posterior margin is minutely pointed at the middle and fringed with nine bristles, of which the outermost being the shortest, the next the longest, and the others become gradually smaller towards the center; each dorso-lateral margin is armed with two bristles or three, the proximal one being near its middle and the other at the posterior (Fig. 2h).

Third maxilliped. —— The last segment is nearly spindle-shaped by expanding the middle portion, and furnished with the setae thickly set over the inner surface (Fig. 2e).

Thoracic legs. —— The first leg reaches the tip of the second segment (A) or the third (B) of the antennular peduncle with its dactylus; the carpus is shorter than the hand, measuring 0.56 mm (A) or 0.54 mm (B) in length, and about 2.5 times as long as its width; the palma is measured 0.31 mm or 0.30 mm, the movable finger 0.44 mm or 0.47 mm in length, the ratio of the former to the latter is 1 : 1.4 or 1 : 1.5, and the ratio of the carpus to the hand is 0.7 or 0.8 : 1 (Figs. 2a, c).

The second leg reaches the tip of the antennular peduncle with its dactylus or palma; the palma is smaller in width than that of the first leg, viz., the ratio of the former to the latter being about 5 : 6; the length of the palma is 0.35 mm and finger 0.5 mm or 0.55 mm, the ratio being 1 : 1.4 or 1.5 (Figs. 2b, d).

The dactyli of the third and fourth legs are slightly curved and furnished with five spines or six along the posterior border, and the outermost one is the largest and the others become gradually smaller towards the innermost (Fig. 2f). The dactylus of the last leg is more than two times and less 2.5 times as long as that of the penult, and fringed with about sixty spinules thickly set along the posterior margin (Fig. 2g).

Distribution. —— Known only from Java (HELLER, DE MAN) and Thailand.

Note. —— The present species resembles *Caridina weberi* DE MAN (1892, p. 371 - 375 pl. 22, fig. 23), but is distinguished from that species by having the following characters, —— 1) the upper rostral teeth extend on the carapace, 2) the carpus of the first thoracic leg is smaller, 3) the posterior portion of the palma fitting in the distal end cavity of the carpus is shallower, and 4) the borne eggs are smaller in size and larger in number.

Family PALAEMONIDAE

Genus **Macrobranchium** BATE, 1868

Macrobranchium lar (FABRICIUS)

(Pl. II; text-figs. 3, 4)

Palaemon lar: ORTMAN, 1891. p. 724. —— MIYAKE, 1938, p. 110. —— KUBO, 1940, p. 21, pl. 2, A - C, text-fig. 14 (in Japanese); 1941, p. 312, text fig. 6.
Palaemon (Eupalaemon) lar: DE MAN, 1892, p. 445. —— ROUX, 1919, p. 330; 1923, p. 9; 1934, p. 531. *Macrobranchium lar*: MAKI and TUTIYA, 1923, p. 56, pl. 5, fig. 1.

Specimens examined. —— Three young females and one young male.

Colour in life. —— The colouration of this species in an aquarium closely resembles that of *Palaemon paucidens* (syn. *Leander paucidens*), although two species are generically

different from each other; namely, the body is brownish, the carapace is traversed by some blackish brown narrow cross-bands, and one, on each side, longitudinal stripe arising from somewhere near the infra-orbital angle of the carapace; the abdomen is provided with the almost invariably seven blackish brown narrow cross-bands in such a way that two are situated on the first pleonic somite and one on each somite from the second to the sixth (Pl. II). Therefore if we were overlook the minute hepatic spine on the antero-lateral portion of the carapace of specimens of this species in mere attention to the colouration only, it should be easily confounded with *Pal. paucidens*. But unlike the colouration of *Pal. paucidens*, the pleonic somites of the young shrimps at the writer's disposal are fringed the lateral-lower margin with the dark brownish streak. This colour-pattern is also found in the Japanese species of the genus *Macrobranchium*.

Dimensions. —— The three females and one male which should be young are measured in mm as shown in the following table (Table I).

Rostrum. —— The carapace is armed with one antennal (suborbital) spine and hepatic one on the each lateral anterior portion. The rostrum is lanceolate, rather broad, with the lateral carina, almost horizontally straight, but slightly recurved upwards in the subterminal

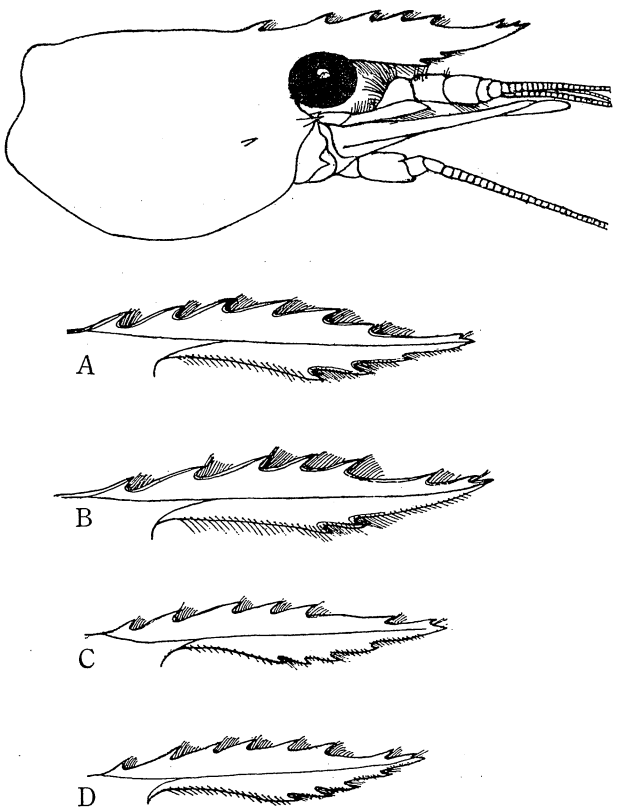

Fig. 3. *Macrobranchium lar* (FABRICIUS). The uppermost. Anterior portion of cephalothorax (× 4). A-D. Rostra of four specimens. A, B, and C - female, D - male.

Table I

Specimen	Body Total length	Carapace (C)	Rostrum (R)	C/R	Telson
A, ♀	36	9.5	7.5	(0.79)	6.0
B, ♀	35	9.0	7.5	(0.83)	6.0
C, ♀	33	8.0	7.0	(0.87)	6.0
D, ♂	28	7.0	6.0	(0.85)	5.0

portion, extends beyond the first antennular peduncle, but not reach the tip of the antennal scale (Fig. 3), about 0.9 times as long as the carapace, the upper border is provided with the seven spines or eight, of which the hindermost one is situated on the carapace, and the foremost one or two are placed near the tip, the interval between the foremost and penult is slightly larger than those between all the other spines (Figs. 3A-D) ; the lowerborder, moderately convex, is armed with the spines of two, three or four on its anterior half portion.

Telson. —— The external shape is subrectangular in the upper view, gradually reducing its width by half posteriorly ; each dorso-lateral margin is armed with two spines, of which the anterior one is situated near its middle and the posterior is placed about midway between the center and the tip ; the distal border is pointed taperingly at the middle and fringed with two pairs of the outer, smaller spines, and the inner, larger ones, and few fine bristles extending beyond the tip of telson (Fig. 4a).

Eyes. —— It is moderate in size with the hemispherical cornea, which is slightly wider than the stalk (Fig. 4f).

Thoracic legs. —— The second pair of the legs is symmetrical, stout, and the longest of all the legs ; the length of the each segment from the merus to the movable finger in mm and those ratios against the finger are shown in the following table (Table II).

Table II

Specimen	Body	Leg				
	Total length	Merus	Carpus	Hand	Palma	Finger
A,	36	4.0 (1.5)	6.0 (2.3)	5.4	2.8 (1.0)	2.6
B,	35	4.0 (2.0)	5.5 (2.7)	4.5	2.5 (1.2)	2.0
C,	33	3.7 (2.1)	5.0 (2.9)	3.8	2.1 (1.2)	1.7
D,	28	3.0 (1.7)	4.0 (2.3)	3.7	2.0 (1.1)	1.7

The carpus is longer than the hand and about two times as long as the palma (Fig. 4b) ; the cutting edge of the movable finger is provided with two small teeth at the basal portion, but the unmovable finger with one small tooth fitting to those opposites (Fig.

4c). Each pair of the legs of the third, fourth and fifth closely resembles one another in shape, but the fifth differs from the penult and antepenult by provided with rather stout bristles, shorter in the inner part and longer in the outer, on the posterior margin near the extremity of the propodus (Fig. 4d). Each dactylus of the legs is rather long and curved.

Abdominal appendages. —— The male provides the endopodite of the second pair with stylamblys of rather thick and bar-shaped, and appendix masuclina of slender-shaped. The appendix masuclina is twice as long as the stylamblys and fringed with rather thicker setae along the inner margin (Fig. 4e).

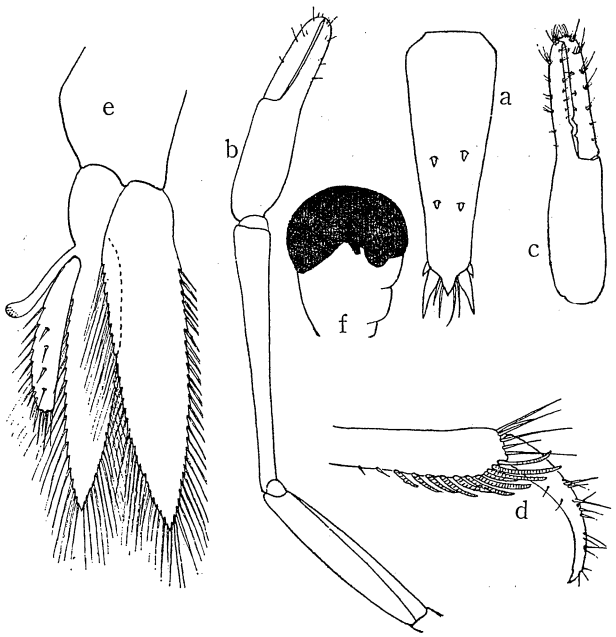

Fig. 4. *Macrobarnchium lar* (FABRICIUS). a. Telson (× 6), b. Second thoracic leg (× 7), c. Second hand (× 6.5), d. Outer portion of fifth thoracic leg (× 5), e. Second abdominal appendage of male, f. Eye (enlarged).

Distribution. —— This species is the most widely distributed in the fresh-waters of the East Indies, such as Celebes, Saleyer, Flores, Adonara, Rotti Island, Timor (DE MAN), Aru Islands, Kei Islands, Amboina, Ceram, and Waigeu (ROUX). Still more this species has a considerable range, namely, Madagascar (ROUX) ; Thailand (herein) ; Marianas, Micronesia (MIYAKE) ; Formosa (MAKI and TUTIYA) ; and Okinawa Island, Okinawa group, Ryukyu (KUBO).

Note. —— In this species it is noteworthy that the proportion in length of the carpus to the hand of the second thoracic leg is changeable according to the growth of the shrimp. In the adult the carpus is shorter than the hand of the second thoracic leg, but in such young individuals at the writer's disposal the case is reverse. The ratio of the carpus

against the hand will certainly become gradually smaller with the growth of the leg. ROUX (1919, p. 331, tables I and II) already observed a similar tendency of growth-change on the many specimens of this species from the Aru and Kei Islands.

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〔MANUSCRIPT RECEIVED AUGUST 31, 1966〕

EXPLANATION OF PLATE I

Caridina laevis HELLER, from Thailand (× 7).

EXPLANATION OF PLATE II

Macrobranchium lar (FABRICIUS), from Thailand (× 1.5).
From up to down, 1-3, young females ; 4, young male.