

A New Freshwater Prawn of the Genus *Macrobrachium* (Decapoda, Caridea, Palaemonidae) from Thailand¹⁾

By

Shigemitsu SHOKITA

Department of Marine Sciences, University of the Ryukyus, Okinawa

and

Masatsune TAKEDA

Department of Zoology, National Science Museum, Tokyo

Abstract A new species of freshwater prawn found at the middle to upper reaches of several rivers in Thailand is described as *Macrobrachium niphanae* sp. nov. It is closely related to *M. pequensis* (TIWARI) from Burma, but these species differ in the shape and proportion of the second pereopods. This new species is also similar to *M. australe* (GUÉRIN-MENEVILLE) widely distributed in the Indo-West Pacific region, but can be easily separated from the latter by the almost straight rostrum failing to reach the end of scaphocerite, the presence of 9 teeth instead of 10 or 11 on the rostral upper border, and the smaller number and larger size of ova. This species lives in the torrential waters of the rivers, and is characterized by bearing large and few eggs.

Introduction

From Thailand the following 11 *Macrobrachium* species of the Palaemonidae have so far been recorded by HOLTHUIS (1950), TIWARI (1952) and SUBATTI (1967): *M. equidens* (DANA), *M. idae* (HELLER), *M. javanicum* (HELLER), *M. lanchesteri* (DE MAN), *M. latidactylum* (THALLWITZ), *M. mirabile* (KEMP), *M. pilimanus* (DE MAN), *M. rosenbergii* (DE MAN), *M. sintangense* (DE MAN), *M. esculentum* (THALLWITZ) and *M. hirsutimanum* (TIWARI). During the survey of the inland-water shrimps and crabs of Thailand in August of 1987, we collected several additional species including four undescribed ones. One of these new species will be described here as *M. niphanae* sp. nov. As will be published in the next report prepared by SHOKITA *et al.* (MS), this new species is very remarkable in carrying large and few eggs, and having a highly abbreviated larval life.

The holotype and allotype specimens are kept in the collection of the National Science Museum, Tokyo (NSMT), and the paratypes and other materials are preserved in the University of the Ryukyus (URM), the Thailand Institute of Scientific and Technological Research (TISTR) and the Rijksmuseum van Natuurlijke Historie,

1) This study is supported by the Grant-in-aid for Overseas Scientific Research No. 63043075 from the Ministry of Education, Science and Culture, Japan.

Leiden (RMNH).

The following abbreviations are used: bl for body length; cl for carapace length.

Macrobrachium niphanae sp. nov.

(Figs. 1-2; Plate 1)

Type series. Holotype, male, NSMT-Cr 9655 (bl 31.6 mm; cl 9.8 mm), allotype, ovigerous female, NSMT-Cr 9656 (bl 29.2 mm; cl 8.5 mm); Nang Rong waterfall stream, Thailand, August 20, 1987, S. SHOKITA leg.

Paratypes. Male, URM-Cr 1431 (cl 13.5 mm), males and female, TISTR-Cr (cl 12.0, 10.0 and 8.6 mm), male and female, RMNH Crust. D37510 (cl 12.0 and 10.0 mm); Nang Rong waterfall stream, Klong Yai, and Khao Chamao, Thailand, August 20-21, 1987, S. SHOKITA leg.

Other materials. Males and females, URM-Cr 1432-1500; Nang Rong waterfall stream, Klong Yai and Khao Chamao, Thailand, August 20-21, 1987, S. SHOKITA leg.

Description of holotype. Integument firm. Carapace entirely glabrous; anterolateral angle of carapace broadly convex; antennal spine well developed; hepatic spine smaller than antennal spine, being placed on a somewhat lower level. Rostrum almost horizontal, reaching beyond antennular peduncle but not to end of scaphocerite; its upper border provided with 9 teeth, of which proximal 3 are situated on carapace behind orbit; foremost tooth placed close to apex; hindmost placed back one-third of carapace; lower border with 3 teeth.

Abdomen smooth, pleurae of first three somites broadly rounded. Postero-lateral angle of sixth somite triangular and its postero-ventral angle acutely pointed. Telson elongate, much longer than sixth abdominal somite; dorsal surface shallowly concave along median line, and armed with two pairs of minute movable spines on posterior half; anterior pair situated at middle, and posterior pair at middle of posterior half; posterior margin ends in a median process which is flanked by two pairs of spines; inner pair about five times as long as the outer; many long, feathered setae present between inner spines.

Eyes typical, cornea distinctly broader and longer than stalk.

Antennular peduncle robust; proximal segment about 1.8 times longer than wide, with acute stylocerite and antero-lateral outer spine; intermediate and distal segments subequal in length and together equal about 0.67 times of proximal segment; two branches of outer antennular flagellum fused basally for eight joints.

Antennal scale broad and about 3.6 times as long as maximum breadth; lateral margin almost straight, being tipped with a strong final tooth; anterior margin of lamella broadly expanded, overreaching lateral tooth; basicerite armed with a strong external tooth.

Mouthparts normal in shape. Mandible typical. Palp of maxillule distinctly divided into two lobes; outer lobe narrower, with three apical and one subapical

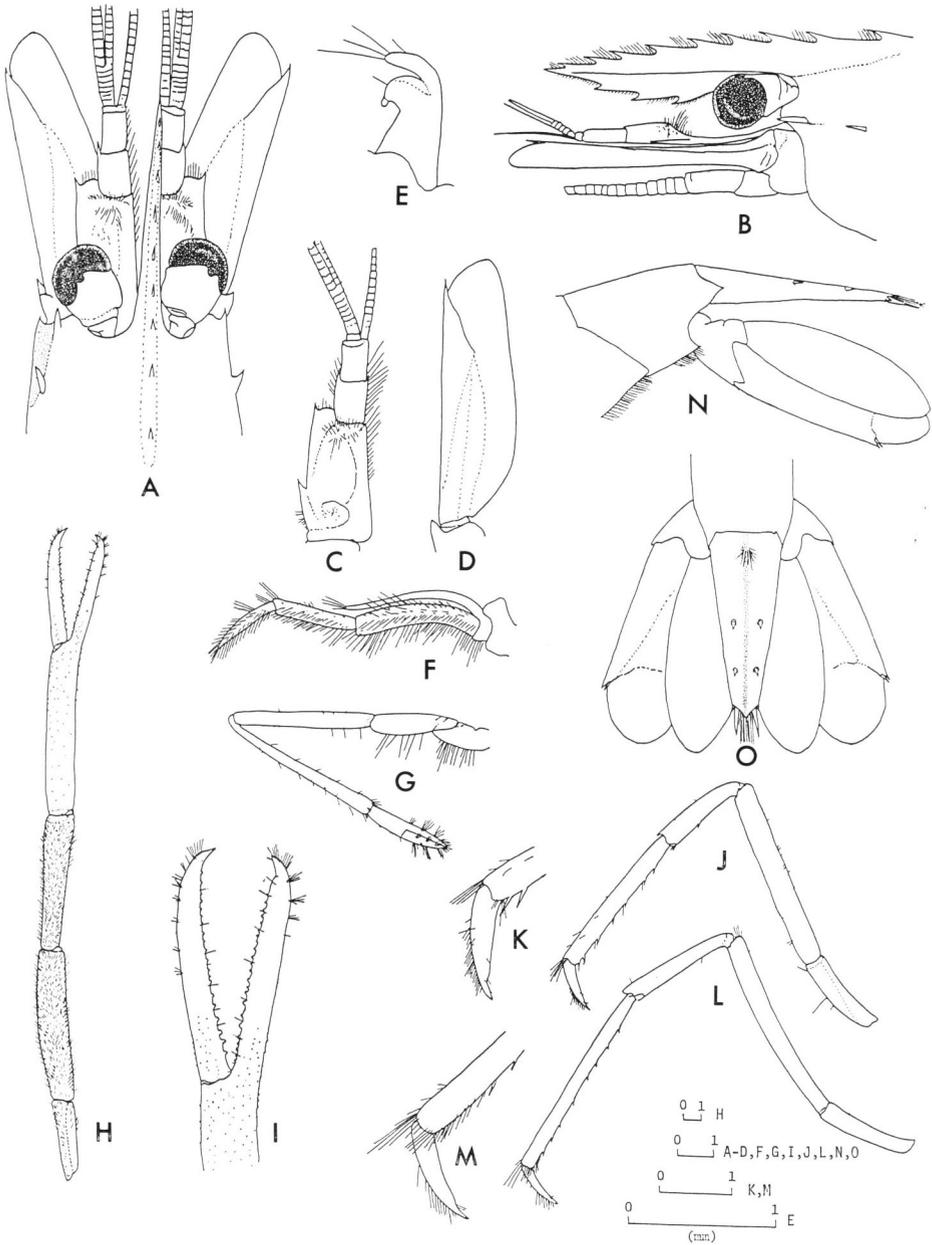


Fig. 1. *Macrobrachium niphae* sp. nov., holotype, male. — A, Anterior part of body in dorsal view; B, anterior part of body in lateral view; C, antennule; D, antenna; E, palp of maxillule; F, third maxilliped; G, first pereopod; H, second pereopod; I, chela of second pereopod; J, third pereopod; K, dactylus of third pereopod; L, fifth pereopod; M, dactylus of fifth pereopod; N, posterior part of body in lateral view; O, telson and uropods.

setae, and the inner with small blunt knob distally and one seta subapically. Scaphognathite of maxilla rather elongate and rounded both anteriorly and posteriorly; thumb-like palp simple and non-setose; endite well developed and deeply cleft. First and second maxillipeds typical. Third maxilliped slender, reaching end of second antennular peduncle; ultimate segment slightly shorter than the penultimate and about 1/1.7 length of the antipenultimate; exopod slightly longer than basal segment.

First pereopod slender, reaching beyond distal end of antennal scale by length of chela; fingers as long as palm; cutting edges of fingers entire, without any tooth; several tufts of sensory setae distributed over surface of fingers; carpus slender and subcylindrical, and slightly longer than merus.

Second pereopod same as the first in general shape, larger and elongate; left leg larger and more robust than the right; fingers distinctly shorter than palm, with tips curved and crossed when they are closed; cutting edge of left movable finger provided with 21 denticles over whole length, these denticles largest in proximal 1/3 part; immovable finger with 24 denticles on cutting edge; palm subcylindrical and slightly compressed, being covered with very small tubercles; carpus subcylindrical, being covered with short velvety hairs, and distinctly shorter than palm; merus somewhat longer than carpus, also with short velvety hairs; ischium also covered with velvety hairs, and shortest in length. Cutting edge of right movable finger provided with 17 denticles over whole length; immovable finger also with 20 denticles on cutting edge; carpus, merus and ischium covered with short velvety hairs. Thick velvety pubescence absent from both chelae.

Third pereopod with dactylus extending beyond antennular peduncle; tip of dactylus slightly curved inward and acutely pointed; numerous setae present on outer 2/3 part; propodus about 3 times as long as dactylus, being armed ventrally with 7 spines; carpus distinctly shorter than propodus, with 2 spines on distal half length; merus longer than propodus, with setae.

Fourth pereopod almost as in third pereopod.

Fifth pereopod longer than third and fourth pereopods; propodus longest, about 4 times as long as dactylus; inner posterior margin with some groups of coarse spinose setae.

Endopod of first pleopod about half as long as exopod; inner margin concave and the outer convex. Appendix masculina of second pleopod longer and stronger than appendix interna, with stiff setae externally along whole length.

Uropods typical, extending well beyond tip of telson; endopod slightly longer than exopod; outer border of exopod almost straight, with an acute tooth distally, adjacent to a slender movable spine.

Notes on allotype. In general appearance, the allotype closely resembles the holotype. Major differences between them are noted below.

Body smaller and less slim than in holotype. Upper border of rostrum provided with 8 teeth, of which proximal 3 are situated on carapace behind orbit; lower border with 3 teeth.

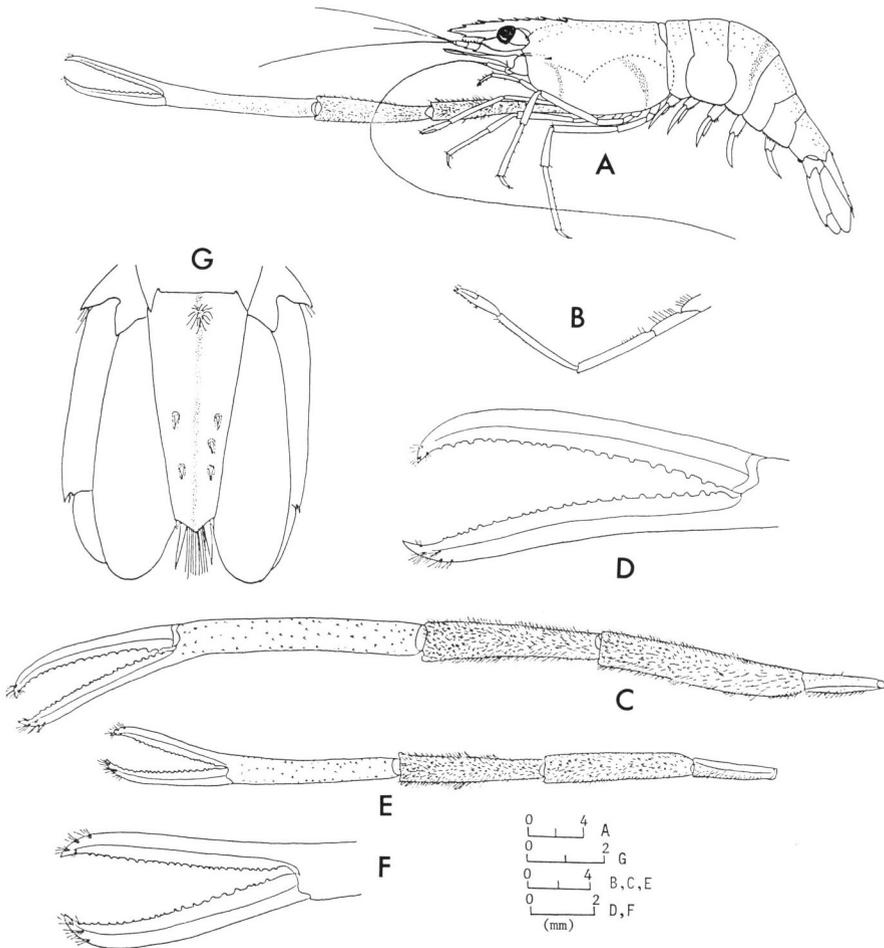


Fig. 2. *Macrobrachium niphae* sp. nov., paratype, male. — A, Lateral view; B, first pereopod; C, right second pereopod; D, chela of right second pereopod; E, left second pereopod; F, chela of left second pereopod; G, telson and uropods.

Second pair of pereopods subequal on both sides, shorter and slenderer than those of holotype; right movable finger provided with 9 denticles on proximal part of cutting edge; immovable finger with 10 denticles on proximal half of cutting edge; palm shorter than carpus, being covered with very small tubercles; carpus and merus almost equal in length.

Ova large, 1.19 × 1.57 mm on an average of 8 eggs, and few, numbering 57.

Otherwise similar to holotype in all non-sexual respects.

Notes on paratypes. In general, the palaemonid prawns from fresh water have considerable morphological variation. In this species, the variations are found in

such characters as the form of the rostrum, the number of the rostral teeth, the number of the dorsal spines on the telson, and the size and form of the second pereopod. These variations are to some degree due to the differences in either sex or age, apart from variability among individuals. They are noted below.

Rostrum of most specimens not reaching antennal scale, but a few reach beyond end of this scale; upper border of rostrum with 8–10 teeth (usually 9), lower with 2–4 (usually 3); 2–3 dorsal teeth (usually 2) situated on carapace; teeth of upper border rather equally spaced, except that the hindmost tooth is more remote than the others. Postero-marginal spine on telson in full-grown males short and blunt, whereas in young and pre-full-grown specimens this spine is acutely pointed. A few specimens armed with 5 dorsal spines on posterior half of telson (Fig. 2).

In males second pereopods of both sides mostly unequal in size and asymmetrical. In young males and females, however, second pereopods subequal in both sides, short and slender, at most overreaching antennal scale by length of chela. Their cutting edges almost entire or only with a few ill-defined denticles.

In adult females second pereopods of both sides equal or subequal in size, and shorter, slenderer than in adult male. Cutting edges of most adult females provided with teeth on about their proximal halves.

Measurements (length in mm).

	Holotype (♂)	Allotype (ovig. ♀)
Body	31.6	29.2
Carapace	9.8	8.5
Rostrum	6.9	6.0
Major second pereopod	35.5	19.2
Minor second pereopod	30.2	19.0

Color in life. Background color is light brown in most specimens of both sexes. Carapace provided with a crescent-shaped marking of blackish brown near postero-lateral part, and with a blackish brown band near antero-lateral part (Fig. 2). Third segment of abdomen striped with a blackish brown band near posterior part. Second to fifth pereopods with scattered blackish brown spots over almost whole surface (Pl. 1).

Habitat. The holotype, allotype and paratypes were collected from Nang Rong waterfall stream which fits for the upper reaches. Additional materials were caught from relatively torrential waters at the middle reaches of Klong Yai, and from the mountain torrential waters at the Khao Chamao National Park. In all these localities, the water was relatively clear and torrential.

Larval development. Larval development is completely suppressed (SHOKITA *et al.*, MS).

Remarks. Morphologically, this species shows the closest resemblance to *Macrobrachium pequensis* (TIWARI) which occurs in Burma and bears a few, large-sized ova

(TIWARI, 1952), but is distinguished from the latter by the different shape and proportion of the second pereopod. In the original description, TIWARI delineated, "second legs [of *M. pequensis*] slightly shorter than half the total length of body, slender and smooth; carpus about eight times as long as its distal diameter, longer than merus as well as palm; palm slightly more than half the length of carpus, about a fourth longer than finger; entire chela a shade shorter than carpus." This indicates that the second pereopod of *M. pequensis* is distinctly different from that of the new species as mentioned above.

The new species is also similar to *M. australe* (GUÉRIN-MENEVILLE), but can be distinguished by the following respects: 1) The rostrum is almost straight and mostly fails to reach the end of the scaphocerite in the new species, whereas in *M. australe* its tip is curved upward and reaches to or slightly beyond the end of scaphocerite. 2) The upper rostral teeth are mostly 9 in the new species instead of usually 10 or 11 in *M. australe*. 3) The hepatic spine is placed on a somewhat lower level of the antennal spines in the new species, whereas it is placed on a distinctly lower level in *M. australe*. 4) In the adult of *M. australe* the second pereopod is thickly covered with spinules, and a velvety coat of short hairs is present on the ischium and merus and sometimes also in the dorsal part of the carpus (cited from HOLTHUIS, 1950). In the new species, however, the surface of the second pereopod is provided with many minute tubercles instead of spines, and the carpus, merus and ischium of the full-grown male are covered with numerous velvety hairs. 5) The ova are much larger in size and fewer in number in the new species (32–81 in number, and ca. 1.63×1.22 mm in diameter, according to SHOKITA *et al.*, MS) than in *M. australe* (1,624–1,766 in number, ca. 0.67×0.51 mm in diameter, according to SHOKITA (1979).

Acknowledgments

The new species is dedicated to Dr. Niphan RATANAWARABHAN, the director of the Ecological Research Division, Thailand Institute of Scientific and Technological Research, Bangkok, who kindly gave us every facilities for the freshwater crustacean survey in Thailand. Sincere thanks are expressed to Professor Dr. L. B. HOLTHUIS of the Rijksmuseum van Natuurlijke Historie, Leiden, for critically reading the draft of this paper. Many thanks are also extended to Dr. Fenner A. CHACE of the National Museum of Natural History, the Smithsonian Institution, Washington D.C., for helpful suggestions. Finally, we are indebted to Messrs. Supachai SITILERT, Taweewat POLPAKDEE and the staff of the Ecological Research Division, Thailand Institute of Scientific and Technological Research, for their cooperation during the crustacean survey in Thailand.

References

HOLTHUIS, L. B., 1950. Subfamily Palaemonidae. The Palaemonidae collected by the Siboga and

- Snellius Expeditions with remarks on other species. I. The Decapoda of the Siboga Expedition. Part. X. *Monogr. Siboga Exped.*, **39**(a-9): 1-268.
- SHOKITA, S., 1979. The distribution and speciation of the inland water shrimps and prawns from the Ryukyu Islands — II. *Bull. Coll. Sci. Univ. Ryukyus*, **28**: 193-278.
- , M. TAKEDA, S. SITTILERT & T. POLPAKDEE, MS. Abbreviated larval development of the freshwater prawn *Macrobrachium niphanae* SHOKITA et TAKEDA (Decapoda, Palaemonidae) from Thailand.
- SUVATTI, S., 1967. Fauna of Thailand (2nd ed.) (pp. 138-140). Applied Scientific Research Corporation of Thailand.
- TIWARI, K. K., 1952. Diagnosis of new species and subspecies of the genus *Palaemon* FABRICIUS (Crustacea: Decapoda). *Ann. Mag. nat. Hist.*, **5**(12): 27-32.

Explanation of Plate 1

Macrobrachium niphanae sp. nov., paratypes.—Top, male; bottom, female.

