Macrobrachium patheinense, a new species of freshwater prawn (Crustacea: Decapoda: Palaemonidae) from Myanmar

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Abstract.—A new species of freshwater palaemonid prawn, Macrobrachium patheinense, is described from Mayan Creek near Pathein City, Ayeyawaddy Division, Myanmar. The new species is most closely related to *M. mirabile* (Kemp, 1917), *M. palaemonoides* Holthuis, 1950, *M. superbum* (Heller, 1862) and *M. inflatum* Liang & Yan, 1985, but can be differentiated by the rostrum shape and dentition, telson shape, and the second pereiopod chela proportions.

Like other South East Asian countries, Myanmar has a wealth of freshwater streams, lakes, ponds and rivers, but unlike its adjacent countries, the freshwater crustaceans have been poorly studied. Important relevant investigations on freshwater decapods have been undertaken in India, Thailand, China, Malaysia, Philippines, and Indonesia (Cai & Dai 1999, Cai & Ng 2001, Chace & Bruce 1993, Holthuis 1978, Jalihal et al. 1988, Liang & Yan 1985, Shokita & Takeda 1989, Tiwari 1947, Wowor & Choy 2001, Yeo et al. 1999, and others).

It was not until 1918 that the first significant carcinological study of Myanmar's fauna was conducted, and since then only 12 species of the shrimp genus *Macrobrachium* Bate, 1868 have been recorded (see Jalihal et al. 1988, Jayachandran 2001, Kemp 1918, Tiwari 1952). A major study by Cai & Ng (2002) reviewed the taxonomy of the Myanmar palaemonid freshwater prawns, reporting one new species and five new records of *Macrobrachium* for the country.

Myanmar's unique geographic position means that it has close connections with India, China, and the rest of the Indo-Malaysian region to the east and south. Thus, there is a strong likelihood that further investigation will lead to more new taxonomic and zoogeographic discoveries. In Myanmar, freshwater shrimps and prawns are important components of inland fisheries, and further taxonomic and ecological studies must be made an urgent priority in order to ensure sustainable management and conservation of stocks.

Specimens were collected from Mayan Creek near Thayet Kone village, about five miles west of Pathein City, Ayeyawaddy Division, on 6 September 2001. All specimens were preserved in formalin for shipping to Japan and examined at the Laboratory of Aquatic Resource Science, Faculty of Fisheries, Kagoshima University. Among the collected specimens, 38 individuals of a *Macrobrachium* species possessed similar distinctive characteristics that could not be attributed to any known species, and are thus here described as a new species.

The holotype and 33 paratypes are deposited in the Laboratory of Aquatic Resource Science, Faculty of Fisheries, Kagoshima University, Kagoshima, Japan (KUMB). Additional paratypes are also deposited in the Kitakyushu Museum of Natural History, Kitakyushu, Japan (KMNM), and the Zoological Reference Collection (ZRC), Raffles Museum, National University of Singapore.

Numbers in parentheses in "Materials examined" indicate the post-orbital cara-



Fig. 1. *Macrobrachium patheinense*. Lateral view of holotype, KUMBcr 1101; male (8.9 mm). Scale equals 5 mm.

pace length in millimeters. Abbreviations used include: M, male; F, female.

Family Palaemonidae Rafinesque, 1815 Genus Macrobrachium Bate, 1868 Macrobrachium patheinense, new species Figs. 1–2

Materials examined.—Mayan Creek, Thayet Kone village, Pathein City, Ayeyawaddy Division, 6 Sep 2001: holotype, M (8.96), KUMBcr 1101, paratype, 2M (9.16, 8.85), KMNH IvR 400.100, KMNH IvR 400.101, 2M (7.21, 8.75), ZRC 2003.0324, 33M (9.25, 9.14,9.11, 8.47, 8.19, 8.50, 8.65, 8.85, 8.61, 8.33, 8.68, 8.48, 9.08, 9.12, 8.48, 8.31, 8.67, 8.65, 9.67, 8.98, 8.64, 8.10, 8.83, 7.97, 8.61, 8.16, 8.24, 7.92, 8.63, 9.10, 9.07, 7.91, 8.55), KUMBcr 1102–1134.

Diagnosis.—Carapace smooth, with antennal and hepatic spine. Rostrum slender, long; dental formula 2+10/5. Mandible with 3-segmented palp. Scaphocerite broad, with slightly concave outer margin. First pereiopod slender, reaching to end of scaphocerite. Second pereiopod equal, extremely slender; carpus 2 times as long as merus, finger 1.8 times as long as palm, without teeth on cutting edge. Telson with 2 pairs of dorsolateral spinules; posterior margin ending in median tooth; 2 spines and 2 plumose setae on each side, inner spines well developed, outer spine very short, plumose setae shorter than inner spines.

Description.—Rostrum (Figs. 1, 2a) long, slender, reaching beyond end of antennular peduncle almost to end of scaphocerite, tip curving slightly upwards, upper margin with 12 teeth (mode 13, range 11-17), of which 2 teeth (mode 2, range 2-3) are placed behind orbit; first tooth smaller than second, placed further from second than third; upper margin of rostrum with single row of setae between teeth; lower margin with 5 ventral teeth (mode 4, range 3-8), first tooth level with seventh and eighth teeth; ventral portion with single row of setae. Carapace (Fig. 1) has strong antennal spine below lower orbital angle, produced anteriorly to broadly rounded lobe; hepatic spine smaller than antennal spine, placed below and some distance behind antennal spine; branchiostegal groove present.

Abdomen smooth, glabrous, with broadly rounded first to third pleurites; fourth and fifth pleurites produced posteriorly, sixth abdominal somite about 1.5 times as long as fifth. Telson (Figs. 2b, c) 1.4 times length of sixth abdominal somite, with 2 pairs of VOLUME 117, NUMBER 4



Fig. 2. *Macrobrachium patheinense*. Holotype, KUMBcr 1101; male (8.9 mm). a, lateral view of rostrum; b, dorsal view of telson; c, tip of telson; d, antennule; e, antenna; f, mandible; g, second pereiopod; h, chela of second pereiopod; i, dactylus and propodus of third pereiopod; j, first pleopod; k, second pleopod; l, uropodal diaeresis. Scales equal 1 mm.

dorsolateral spinules; posterior margin ending in a median tooth, flanked on each side by 2 spines and 2 plumose setae; inner spine well developed, 4 times as long as median tooth, outer spine very short, 2 plumose setae slightly shorter than inner spine.

Eyes well-developed, with cornea as long as stalk.

Basal segment of antennular peduncle (Fig. 2d) broad, stylocerite very short, distinctly pointed, not reaching middle of basal segment; anterolateral spine of basal segment reaching about middle of second segment; second segment as long as third segment; anterior margin of basal segment strongly curved. Scaphocerite (Fig. 2e) 3.2 times as long as broad, not reaching tip of rostrum; outer margin slightly concave, ending in a tooth, not reaching end of lamella. Mandible (Fig. 2f) with outer, lateral, 3-segmented palp. Other mouth parts typical for genus.

First pereiopod slender, reaching end of scaphocerite (Fig. 1); fingers slightly longer than palm, with numerous setae; carpus about twice as long as chela, broadest distally, narrowing proximally; merus shorter than carpus; ischium about half as long as merus. Second pereiopods (Figs. 2g, h) equal in size and shape, extremely slender, carpus reaching beyond scaphocerite by half its length; chela gradually narrowing proximally, finger very long, slender, about 1.8 times as long as palm (mean 1.7, range 1.4-1.9), same width throughout length, cutting edge entire, tip curves inwards; carpus as long as chela, unarmed, with distal portion broadest; merus about half as long as carpus (mean 0.7, range 0.5-0.9) but equal with ischium. Pereiopods 3-5 slender, subequal in size; third pereiopods overreaching scaphocerite by length of entire dactylus; dactylus (Fig. 2i) slender, concave on ventral, with numerous setae on dorsal surface, measuring about 1/3 of propodus length; propodus with eight spinnules on ventral surface, about twice as long as carpus; merus nearly as long as propodus; ischium about same length as carpus; fourth

pereiopods shorter than fifth but longer than third.

Exopod of first pleopod (Fig. 2j) ovalshaped, with small endopod, inner margin concave. Second to sixth pleopods nearly equal with endopods and exopods; endopod with a slender appendix interna. Second pleopod (Fig. 2k) with appendix masculina, placed between appendix interna and endopod; appendix masculina longer, stronger than appendix interna, bearing several stiff setae. Uropods reaching beyond end of telson; exopods ovate, outer margin straight, inner margin convex, uropodal diaeresis (Fig. 2l) with a spine slightly longer than outer angle; endopods broadly ovate, smaller than exopods.

Color.-Grayish white when live.

Etymology.—The specific name is adapted from the type locality (Pathein) where the specimens were collected.

Distribution.—Macrobrachium patheinense inhabits freshwater and slightly brackish water habitats, known so far only from the type locality.

Remarks.—Macrobrachium patheinense is similar to the Palaemon-like Macrobrachium species, that have slender and delicate pereiopods, especially M. mirabile (Kemp, 1917), M. palaemonoides Holthuis, 1950, M. superbum (Heller, 1862) and M. inflatum Liang & Yan, 1985. Macrobrachium patheinense is, however, distinguishable from M. mirabile by the shape of the rostrum and telson. The rostrum of M. patheinense is slender and longer than the scaphocerite, while that of M. mirabile is shorter than the scaphocerite, and has a high dorsal crest (Kemp 1917). The telson of the former has two pairs of plumose setae slightly shorter than the inner spine, but that of the latter has only one pair of plumose setae longer than the inner spine. The new species is also distinguished from M. palaemonoides by shapes of the rostrum and telson, and the proportions of chelae of the second pereiopods. The rostrum of M. patheinense is armed with teeth along the entire upper margin, but that of M. palaemonoides has an unarmed area on its distal half (Holthuis 1950, Kamita 1974). The telson terminates in a short median tooth in M. patheinense, but this tooth is longer in M. palaemonoides (Kamita 1974). The movable finger of the second pereiopod is 1.4-1.9 (mean 1.7) times as long as the palm in M. patheinense, but 1.3-1.4 times as long as the palm in M. palaemonoides (Chace & Bruce 1993, Holthuis 1950). The new species can easily be distinguished from M. superbum by the shape of the rostrum and the second pereiopod chela proportions. The rostrum doesn't reach beyond the distal end of the scaphocerite in M. superbum (Cai & Dai 1999, Holthuis 1950), but distinctly further in M. patheinense. In addition, the upper margin of the rostrum is generally straight in M. superbum, but distally upcurved in M. patheinense. The movable finger of second pereiopod is 1.2-1.5 times as long as the palm in M. superbum, but 1.4-1.9 (mean 1.7) times in M. patheinense. The rostral shape and formula of M. patheinense is most similar to those of M. inflatum, but the second pereiopods and telson of both species are different. The movable finger of the second pereiopod of M. inflatum is subequal to the length of the palm (0.9-1.0 from the figures of Cai & Dai (1999) and Liang & Yan (1985)), but that of M. patheinense is much longer than the palm (1.4-1.9, mean 1.7). The telson of M. inflatum bears three pairs of plumose setae, these setae being longer than the inner spine on the posterior margin, but M. patheinense has only two pairs of plumose setae that are slightly shorter than the inner spine.

The unique chela of *M. patheinense* resembles that of *Leandrites stenopus* Holthuis, 1950, and *Pseudopalaemon bouvieri* Sollaud, 1911, however the presence of a mandibular palp in *M. patheinense* confirms its placement in *Macrobrachium* and distinguishes it from all *Leandrites* and *Pseudopalaemon* species (Holthuis, 1993).

Thus, the new species appears to occupy an interesting phylogenetic position and should be included in future studies investigating generic relationships within the family Palaemonidae.

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Literature Cited

- Cai, Y., & A. Y. Dai. 1999. Freshwater shrimps (Crustacea: Decapoda: Caridea) from the Xishuangbanna region of Yunnan Province, southern China.—Hydrobiologia 400:211–241.
- ——, & P. K. L. Ng. 2001. The freshwater decapod crustaceans of Halmahera, Indonesia.—Journal of Crustacean Biology 21(3):665–695.
- ——, & ——. 2002. The freshwater palaemonid prawns (Crustacea: Decapoda: Caridea) of Myanmar.—Hydrobiologia 487:59–83.
- Chace, F. A., Jr., & A. J. Bruce. 1993. The Caridean Shrimps (Crustacea: Decapoda) of the *Albatross* Philippine Expedition 1907–1910. Part 6: Superfamily Palaemonoidea.—Smithsonian Contributions to Zoology 543:1–52, pls. 1–7.
- Heller, C. 1862. Neue Crustaceen, gesammelt wahrend der Weltumseglung der k. k. Fregatte Novara. Zweiter vorlauliger Bericht.—Verhandlungen der kaiserlich-koniglichen zoologisch-botanischen Gesellschaft in Wien 12:519–528.
- Holthuis, L. B. 1950. The Decapoda of the Siboga Expedition. Part 10. The Palaemonidae collected by the Siboga and Snellius Expeditions with remarks on other species. 1. Subfamily Palaemoninae.—Siboga Expeditie 39(a9):1–268, figs. 1–52.
 - ——. 1978. A collection of decapod Crustacea from Sumba, Lesser Sunda Islands, Indonesia.— Zoologische Verhandelingen 162:1–55.
- . 1993. The Recent genera of the Caridean and Stenopodidean Shrimps (Crustacea, Decapoda), with an Appendix on the Order Amphionidacea. Nationaal Natuurhistorisch Museum, Leiden, 328 pp.
- Jalihal, D. R., S. Shenoy, & K. N. Sankolli. 1988. Freshwater prawns of the genus Macrobrachium Bate, 1868 (Crustacea, Decapoda, Palaemonidae) From Karnataka, India.—Records of the Zoological Survey of India, Miscellaneous Publication, Occasional Paper No. 112:1–74.
- Jayachandran, K. V. 2001. Palaemonid Prawns: Bio-

diversity, Taxonomy, Biology and Management. Science Publishers, Enfield, 624 pp.

- Kamita, T. 1974. Four species of the Nepalese prawns.—Researches on Crustacea 6:1–16, pls. 1–2.
- Kemp, S. 1917. Notes on Crustacea Decapoda in the Indian Museum. IX. *Leander styliferus*, Milne-Edwards, and related forms.—Records of the Indian Museum 13:203–231, pls. 8–10.
 - —. 1918. Crustacean Decapoda of the Inle Lake Basin.—Records of the Indian Museum. 14:81– 102, pls. 15–16.
- Liang, X.-Q., & S.-I. Yan. 1985. New species and new record of palaemonidae from China (Crustacea Decapoda) (in Chinese with English summary).—Acta zootaxonomica Sinica, 10(3):253– 258. figs. 1–4.
- Shokita, S., & M. Takeda. 1989. A new freshwater prawn of the genus *Macrobrachium* (Decapoda, Caridea, Palaemonidae) from Thailand.—Bulletin of the National Science Museum, Tokyo, Series A (Zoology), 15(3):147–154.

- Sollaud, E. 1911. Pseudopalaemon Bouvieri, nouveau genre, nouvelle espece, de la Famille des Palaemonidae.—Bulletin du Museum National d'Histoire Naturelle, Paris 17:12–16.
- Tiwari, K. K. 1947. Preliminary descriptions of two new species of *Palaemon* from Bengal.—Records of the Indian Museum 45(4):329–331.
- Wowor, D., & S. C. Choy. 2001. The freshwater prawns of the genus *Macrobrachium* Bate, 1868 (Crustacea: Decapoda: Palaemonidae) from Brunei Darussalam.—The Raffles Bulletin of Zoology 49(2):269–289.
- Yeo, D. C. J., Y. Cai, & P. K. L. Ng. 1999. The freshwater and terrestrial decapod Crustacea of Pulau Tioman, Peninsular Malaysia.—The Raffles Bulletin of Zoology, Supplement No. 6:197– 244.

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