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All Authors	Win Mar and Pyone Pyone Myint
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Some Freshwater Palaemonid Prawns (Crustacea: Decapoda: Palaemonidae) from Magway Environs

Win Mar and Pyone Pyone Myint

Abstract

This study represents a preliminary investigation into the occurrence of freshwater prawn nearby Magway environs. Eight species of the genus *Macrobrachium* Bate, 1865 namely *M. aemulum*, *M. cavernicola*, *M. clymene*, *M. lamarrei*, *M. lanchesteri*, *M. latidactylus*, *M. palaemonoides*, *M. rosenbergii* were recorded. With respect to *M. aemulum*, *M. cavernicola*, *M. clymene* and *M. latidactylus*, there are no previous record and information. Morphological characters were used to identify the species level. There is a need to extend the study of other freshwater prawns to add to the list of palaemonid species of Myanmar. The authors hoped that this study may contribute substantially to the regional freshwater prawn biodiversity and an additional contribution to Myanmar Carcinology.

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Introduction

Shrimp and prawn are invertebrates belonging to the same group called decapods that included in the class Crustacea. The Palaemonoidae (Rafinesque, 1815) is the largest family of the order Decapoda, comprised of 2 subfamilies and 102 genera (Li, Bruce and Manning, 2004). The subfamily Palaemoninae are less diverse phylogenetically, but more diverse ecologically. They distributed widely in world: marine, estuarine and fresh-waters (Holthuis, 1980).

The vast majority of freshwater prawn species of commercial interest are recorded to the genus *Macrobrachium* which is well known because of the number of species, wide geographic distribution, and commercial importance (Hernández, Murugan, Ruiz-Campos and Maeda-Martínez, 2007).

According to I T I S (Integrated Taxonomic Information System), there are approximately 270 species of the genus *Macrobrachium* which are distributed throughout the tropical and subtropical regions of the world.

In the recent year, Jayachandran, Raji and Mohan (2004, 2007), Xuân (2006), Li, Cai and Clarke (2006) and Klotz (2008) recorded the new species of *Macrobrachium* India, Vietnam and China and India respectively. Yukio,

1. Dr, Associate Professor, Department of Zoology, Sagaing University
2. Dr, Assistant Lecturer, Department of Zoology, Monywa University

Imai, Lasasimma, Souliyamath and Ito (2011) recognised the fourteen species of the genus *Macrobrachium* from the Laotian river system and of which 11 species are new records to the Laotian fauna. Arumugam also listed that a total of 24 species of *Macrobrachium* prawns are available from Tamil Nadu, India.

In Myanmar, Cai and Ng (2002) reviewed the taxonomy of seventeen species of *Macrobrachium*. In addition, Hla Phone and Suzuki (2004) reconfirmed ten species of *Macrobrachium* and also erected a new species of *Macrobrachium patheinense* from Myanmar. Win Mar (2007) reported the five species of the same genus including one new record, *M. lanceifrons* (Dana, 1852) from Taungthaman Lake, Upper Myanmar.

The work on shrimp and prawn in Myanmar is in infant stage. There exists scanty of information pertaining to taxonomy and diversity of shrimp and prawn of Myanmar. Therefore further taxonomic studies of Myanmar's shrimp and prawn should be investigated in order to append the list of palaemonid species and biodiversity prosperity of Myanmar.

At Magway environs, there is scarcity information on the taxonomy of prawns. So investigation on the occurrence of freshwater prawn species from Magway environs is necessary. In view of this, the present study was conducted to record and describe the some morphological characters of fresh water palaemonid prawn species from Magway environs.

Materials and methods

Study period

The study period lasted from May, 2010 to July, 2011.

Specimen collection and identification

Prawn samples were collected from the fishermen near by Magway located between latitudes 20° 09' - 20° 11' North, and longitudes 94° 53' -94° 54' East. Collected specimens were photographed, preserved in 70% alcohol and identified in accordance with Holthuis (1950) and Cai and Ng (2002) mainly based on the important taxonomic characters of male.

Taxonomic hierarchy was drawn followed by I T I S (Integrated Taxonomic Information System).

Results

Eight species of the freshwater prawn under genus *Macrobrachium* were recorded in this study.

Taxonomic hierarchy of studied species

Kingdom	Animalia
Phylum	Arthropoda
Class	Crustacea Brünnich, 1772
Subclass	Malacostraca Latreille, 1802
Order	Decapoda Latreille, 1802
Suborder	Pleocyemata Burkenroad, 1963
Infraorder	Caridea Dana, 1852
Superfamily	Palaemonoidea Rafinesque, 1815
Family	Palaemonidae Rafinesque, 1815
Subfamily	Palaemoninae Rafinesque, 1815
Genus	<i>Macrobrachium</i> Bate, 1865
Species	<i>Macrobrachium aemulum</i> (Nobili, 1906) <i>Macrobrachium cavernicola</i> (Kemp, 1924) <i>Macrobrachium clymene</i> (De Man, 1902) <i>Macrobrachium lamarrei</i> (H. Milne-Edwards, 1837) <i>Macrobrachium lanchesteri</i> (De Man, 1911) <i>Macrobrachium latidactylus</i> (Thallwitz, 1891) <i>Macrobrachium palaemonoides</i> Holthuis, 1950 <i>Macrobrachium rosenbergii</i> (De Man, 1879)

Morphological characters of freshwater prawn species1. *Macrobrachium aemulum* (Nobili, 1906)

Rostrum : short, not curved upward, without a distinct elevated basal crest, upper margin with 12 teeth, lower margin with 12 teeth, 3 teeth of the dorsal margin of rostrum behind the orbit.

Second pereiopod : second chelate legs very long; carpus distinctly longer than merus and chela; fingers distinctly shorter than palm; finger of the large chela with 2 teeth. (Fig. A)

2. *Macrobrachium cavernicola* (Kemp, 1924)

Rostrum : straight, short, upper margin with 7 teeth, lower margin with 3 teeth.

Second pereopod : second chelate legs subequal in shape; carpus shorter than merus and chela, triangular in longitudinal section; fingers distinctly shorter than palm; finger of the second legs with 2 teeth. (Fig. B)

3. *Macrobrachium clymene* (De Man, 1902)

Rostrum : short and high, not curved upward, with elevated basal crest, upper margin with 7 teeth, ventral margin with 3 teeth, 4 teeth of the dorsal margin of rostrum behind the orbit.

Second pereopod : Second chelate legs subequal in shape, carpus distinctly shorter than merus and shorter than chela, more or less triangular in longitudinal section; entirely pubescent and spinulose; tubercles on the second leg very long; fingers distinctly shorter than palm; finger of the second chelate legs with 2 teeth. (Fig. C)

4. *Macrobrachium lamarrei* (H. Milne Edwards, 1837)

Rostrum : rostrum straight, distal half curved upwards, without a distinct elevated basal crest, lower and upper margin with 6 teeth; 3 teeth of the dorsal margin of the rostrum behind the orbit.

Second pereopod : carpus as long as the merus and longer than the chela, without tubercles; finger distinctly shorter than palm; finger of the large chela with 2 small teeth. (Fig. D)

5. *Macrobrachium lanchesteri* (De Man, 1911)

Rostrum : slightly upturned at anterior one third, without distinct elevated basal crest, upper margin with 7 teeth, lower margin with 3 teeth; 2 teeth of dorsal margin of the rostrum behind orbit.

Second pereopod : carpus distinctly longer than merus; finger shorter than palm, smooth, without tubercles; finger of the large chela with 2 small teeth. (Fig. E)

6. *Macrobrachium latidactylus* (Thallwitz, 1891)

Rostrum : dorsal margin slightly convex, without a distinct elevated basal crest, teeth directed forwards, upper margin with 11 teeth, lower margin with 4 teeth.

Second pereopod : Second chela subequal in shape; carpus as long as merus; carpus shorter than the chela, with small tubercles and hairs; finger longer than

the palm, strongly curved at the tip; palm of large chela with some scattered short hairs. (Fig. F)

7. *Macrobrachium palaemonoides* Holthuis, 1950

Rostrum : distal half curved upwards, without a distinct elevated basal crest, upper margin with 7 teeth, lower margin with 6 teeth, 3 teeth of the dorsal margin of rostrum behind the orbit.

Second pereiopod : slender, smooth without spine, carpus longer than the merus and chela; finger shorter than palm, finger of the large chela with 2 small teeth. (Fig. G)

8. *Macrobrachium rosenbergii* (De Man, 1879)

Rostrum : very long, with a distinct elevated basal crest, anterior end curved upward, surpassing distal border of scaphocerite; upper margin with 12 teeth, lower margin with 7 teeth.

Second pereiopod : carpus distinctly longer than merus and shorter than chela; entirely pubescent and spinulose; fingers distinctly shorter than palm; palm cylindrical and somewhat compressed. (Fig. H)



A. *M. aemulum*



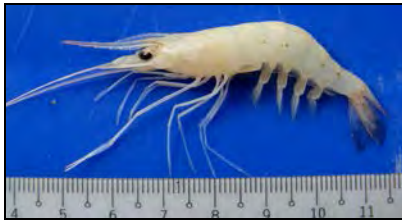
B. *M. cavernicola*



C. *M. clymene*



D. *M. lamarrei*

E. *M. lanchesteri*F. *M. latidactylus*G. *M. palaemonoides*H. *M. rosenbergii*Fig. Recorded species of Genus *Macrobrachium*

Discussion

Myanmar though has a wealth of freshwater streams, lakes, ponds and rivers; investigations on the fauna of shrimps and prawns have been intermittent and literature on the freshwater crustaceans of Myanmar is rather scanty. In addition there are available on the fauna of fresh and brackish water shrimps and prawns of adjacent countries in general, but little is known about the palaemonid prawn of Myanmar.

In this study, eight species of freshwater prawns under genus *Macrobrachium* namely *M. aemulum*, *M. cavernicola*, *M. clymene*, *M. lamarrei*, *M. lanchesteri*, *M. latidactylus*, *M. palaemonoides* and *M. rosenbergii* were recorded.

In Myanmar, twenty six species of *Macrobrachium* was reported including two new species, *Macrobrachium lanatum* (Cai and Ng, 2002) and *Macrobrachium patheinense* (Hla Phone and Suzuki, 2004). Win Mar (2007) presented that one new record namely *M. lanceifrons* (Dana, 1852) from Taungthaman Lake, Upper Myanmar.

Although twenty five species of the genus *Macrobrachium* from Upper Myanmar was recorded by Mie Mie Sein *et al.*, (2009), fifteen could not be identified down to the species level. But three species are observed to be recorded for the first time from Myanmar namely *M. yui* Holthuis, 1950, *M. hildebradti* (Hilgendorf, 1893) and *M. latimanus* (Von Martens, 1868).

Jayachandran *et al.*, (2007) proposed the division of the genus *Macrobrachium* into two subgenera. The subgenus *Macrobrachium* includes those species with the second pair of pereopods with equal or subequal chelae, and the subgenus *Allobrachium* includes those species with the second pair of pereopods with unequal chelae.

In the present work, second pairs of pereopods are distinctly unequal in *M. cavernicola*, *M. clymene* and *M. latidactylus* while those in the remaining species are found to be equal in shaped and their length.

The most important characters to identify the freshwater prawn species of *Macrobrachium* are armature of rostrum, number of dorsal and ventral rostral teeth, proportion of rostrum and scaphocerite, size and proportion of the carpus, merus and dactylus of second pereopod, presence or absence of spinulose setae on the second chelate legs, number of teeth on the cutting edge of fingers, number of plumose setae between the two inner spines of telson, and proportion of the length of telson and inner spine of telson (Win Mar, 2007).

In all the eight species, there are differences not only in the shape of the rostrum but also in the proportion of carpus and merus. Rostrum without distinct elevated basal crest was recorded in the four species such as *M. palaemonoides*, *M. lanchesteri*, *M. aemulum*, and *M. rosenbergii*. However *M. lamarrei*, *M. latidactylus*, *M. clymene* and *M. cavernicola* rostrum with distinct elevated basal crest was found to be recorded.

Although carpus of the second pereopod is generally longer than merus in *M. aemulum*, *M. rosenbergii*, *M. palaemonoides*, *M. latidactylus*, *M. lamarrei* and *M. lanchesteri*, but in *M. cavernicola*, *M. clymene*, the former is generally shorter than latter.

Wowor and Ng (2007) examined that the spination of the second pereopods of adult specimens is very useful in separating the two species. Moreover, Aguirre and Hendrickx (2005) emphasized that morphological abnormalities have been noticed among decapod crustaceans, especially in the malformation of appendages or body segments. Some species also present significant morphological changes in rostral structure and size during growth.

Although identification of the genus *Macrobrachium* is quite difficult due to great morphological variations, further taxonomic studies of shrimp and

prawn should be investigate in order to append the list of palaemonid species of Myanmar.

Conclusion

This study reports the occurrence of eight freshwater prawn species of genus *Macrobrachium* from Magway environs. With respect to *M. aemulum*, *M. cavernicola* and *M. clymene* and *M. latidactylus* there are no previous record and information concerning these species. So it can be tentatively taken that these four species are the first record from studied area.

To date, a total of thirty three species of genus *Macrobrachium* were recorded from Myanmar (Table.1). So our results may give relevant information on the species diversity existing in Myanmar. The authors hoped that this study may contribute substantially to the regional freshwater prawn biodiversity and an additional contribution to Myanmar Carcinology.

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Table 1. Freshwater Palaemonid Prawn of Genus *Macrobrachium* recorded in Myanmar

Sr No.	Species name	Cai & Ng 2002	Hla Phone & Suzuki 2005	Mie Mie Sein <i>et. al</i> , 2009	Present work 2013
1	<i>M. assamense assamense</i> (Tiwari, 1968)	*			
2	<i>M. birmanicum</i> (Schnekel, 1902)	*			
3	<i>M. dayanum</i> (Henderson, 1893)	*			
4	<i>M. hendersoni hendersoni</i> (De Man, 1906)		*		
5	<i>M. idella</i> (Hilgendorf, 1898)		*		
6	<i>M. joppae</i> Holthuis, 1950		*		
7	<i>M. lammarei</i> (H. Milne Edwards, 1837)		*	*	*
8	<i>M. lanatum</i> Cai & Ng, 2002	*			
9	<i>M. lanchesteri</i> (De Man, 1911)	*	*	*	*
10	<i>M. lar</i> (Fabricius, 1798)	*			
11	<i>M. malcolmsonii</i> (H. Milne Edwards, 1844)			*	
12	<i>M. minutum</i> (J.Roux, 1917)		*		
13	<i>M. mirabile</i> (Kemp, 1917)	*	*		
14	<i>M. naso</i> (Kemp, 1918)	*	*		
15	<i>M. neglectum</i> (De Man, 1905)	*			
16	<i>M. nipponense</i> (De Man, 1849)	*		*	
17	<i>M. palaemonoides</i> Holthuis, 1950		*	*	*
18	<i>M. patheinense</i> Hla Phone & Suzuki, 2004		*		
19	<i>M. peguense</i> (Tiwari, 1952)	*			
20	<i>M. platyrostris</i> (Tiwari, 1952)	*			
21	<i>M. rogersi</i> (Tiwari, 1952)	*			
22	<i>M. rosenbergii</i> (De Man, 1911)	*	*	*	*

Sr No.	Species name	Cai & Ng 2002	Hla Phone & Suzuki 2005	Mie Mie Sein <i>et. al</i> , 2009	Present work 2013
23	<i>M. villosimanus</i> (Tiwari, 1947)	*			
24	<i>M.cf.villosimanus</i> (Tiwari, 1947)	*			
25	<i>M. hildebrandti</i> (Hilgendorf, 1893)			*	
26	<i>M. lanceifrons</i> (Dana, 1852)			*	
27	<i>M. latimanus</i> (Vol Martens, 1869)			*	
28	<i>M. yui</i> Holthuis, 1950			*	
29	<i>M. aemulum</i> (Nobili, 1906)				*
30	<i>M. cavernicola</i> (Kemp, 1924)				*
31	<i>M. clymene</i> (De Man, 1902)				*
32	<i>M. latidactylus</i> (Thallwitz, 1891)				*