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Prevalence of *Macrobrachium gangeticum* (*Macrobrachium choprai*) Bate. in Siang river at D'Ering wild life sanctuary, Arunachal Pradesh (a biodiversity hot-spot)

V.K.Srivastava*, S. Bose and Kento Kadu

Department of Zoology

J.N.College, Pasighat, PO-Hill Top-791103, Arunachal Pradesh (India)

E-mail- srivks1@rediffmail.com, srivks1@gmail.com

Abstract

*The paper deals with the extended distribution of *Macrobrachium gangeticum* (which is a large sized prawn) in Siang river at D' Ering Sanctuary of Arunachal Pradesh. Siang river is a fast flowing river and availability of the *M. gangeticum* to this river exhibits its capacity to resist the water current; however, it was collected during winter months when the water current was comparatively low but still not much low. *M. gangeticum* was identified by its large size and presence of dorsal elevated rostral keel.*

Key Words- *Macrobrachium gangeticum*, distribution, Siang river

Introduction

The paper deals with distribution and availability of *Macrobrachium gangeticum* (Bate) in Siang river at D' Ering sanctuary of Arunachal Pradesh. Earlier, it was known to be the *Macrobrachium choprai* (Tiwari); but later, it was re-named as *M. gangeticum* Bate (Tiwari and Holthuis, 1996). Normally it is distributed in Gages basin (Tiwari, 1949) with very laminar flow zone of rivers; however, its distribution is also reported from Assam (Tiwari, 1955) and Arunachal Pradesh in the rivers of slow water current. Considering its distribution in north-east region (apart from Assam) of the country, it is also reported from Meghalaya, Sikkim and Tripura (Ghosh *et al.* 1999; Ghosh and Roy, 2000 and Roy, *et al.*, 2003). In Arunachal Pradesh, it is reported from smaller tributaries of Siang river with comparatively slow water current (Ghosh *et al.* 2006). Present paper reports the prevalence of *M. gangeticum* from Siang river in which water current was slightly high (Srivastava, 2006).

Material and Methods

Adult *M. gangeticum* was collected from the Siang River with the help of fishermen at D'Ering Sanctuary of Arunachal Pradesh, fixed in formalin and brought to the laboratory for morphometric measurements.

Results and Discussion

M.gangeticum was earlier known to be the *Macrobrachium choprai* (Tiwari), but recently it was recredited as *Macrobrachium gangeticum*, Bate (Tiwari and Holthuis, 1996). Generally, it was more

prevalent in the Ganges basin specially in Ganga river (Singh and Srivastava, 1989) and other peninsular rivers of the country with very slow water current as these are the bottom dwellers; but its

Table-1 Morphometric measurements of *Macrobrachium gangeticum* (*M. choprai*) Bate. of Siang river Arunachal Pradesh (Males)

| S.N | Characters | Number of specimen measured | | | | | |
|-----|--------------------------------------|-----------------------------|--------------------------|--------------------------|--------------------------|----------------------|-------------------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | Total length (mm) | 125 | 145 | 148 | 127 | 115 | 125 |
| 2 | Carapace length (mm) | 28 | 33 | 35 | 27 | 24 | 24 |
| 3 | Rostrum (mm) | | | | | | |
| | <i>a- Length</i> | 31 | 32 | 32 | 40 | 24 | 33 |
| | <i>b- Post-keel length</i> | 10 | 10 | 10 | 11 | 08 | 10 |
| | <i>c-Rostral formula</i> | $\frac{(2)8 + 2}{5}$ | $\frac{(2)7 + 1 + 1}{4}$ | $\frac{(2)7 + 1 + 1}{4}$ | $\frac{(2)7 + 1 + 1}{5}$ | $\frac{(2)9 + 1}{5}$ | $\frac{(2) + 8 + 1}{4}$ |
| 4 | Telson length (mm) | 14 | 16 | 17 | 16 | 10 | 14 |
| 5 | Antennule (mm) | | | | | | |
| | <i>a- Pre-coxa</i> | 07 | 7.5 | 7.5 | 07 | 06 | 07 |
| | <i>b- Coxa</i> | 06 | 06 | 06 | 05 | 04 | 06 |
| | <i>c-Basis</i> | 05 | 05 | 05 | 4.5 | 04 | 05 |
| 6 | Eye (mm) | | | | | | |
| | <i>Size of cornea</i> | 5.0 | 05 | 05 | 05 | 4 | 05 |
| 7 | 1st Chelipede (mm) | | | | | | |
| | <i>a-Ischium</i> | 08 | 10 | 10 | 08 | 08 | 08 |
| | <i>b- Merus</i> | 12 | 12 | 15 | 12 | 10 | 12 |
| | <i>c- Carpus</i> | 17 | 17 | 19 | 17 | 13 | 17 |
| | <i>d- Propodus</i> | 08 | 08 | 9.0 | 08 | 06 | 08 |
| | <i>e- Dactylus</i> | 06 | 05 | 6.0 | 06 | 04 | 06 |
| 8 | 2nd Chelipede (mm) | | | | | | |
| | <i>a-Ischium</i> | 13 | 16 | 21 | 16 | 14 | 15 |
| | <i>b- Merus</i> | 14 | 20 | 25.5 | 18.5 | 14 | 16 |
| | <i>c- Carpus</i> | 18 | 25 | 29.0 | 22 | 18 | 18 |
| | <i>d- Propodus</i> | 25 | 32 | 41 | 39 | 24 | 26 |
| | <i>e- Dactylus</i> | 14 | 17 | 22 | 15 | 12 | 14 |
| | Periopds (mm) | | | | | | |
| | <i>a-Ischium</i> | 07 | 08 | 09 | 07 | 06 | 07 |
| | <i>b- Merus</i> | 15 | 17 | 19 | 15 | 13 | 15 |
| | <i>c-Carpus</i> | 08 | 10.5 | 10.5 | 08 | 07 | 08 |
| | <i>d- Propodus</i> | 13 | 17 | 17 | 14 | 11 | 12 |
| | <i>e- Dactylus</i> | 06 | 7.0 | 7.5 | 06 | 05 | 05 |
| 10 | Uropods (mm) | 19 + 17 | 22 + 19 | 22 + 19 | 19 + 17 | 17 + 15 | 17 + 15 |

* In rostral formula, values given in parenthesis are pre-orbit teeth

Table-2 Morphometric measurements of *Macrobrachium gangeticum* (*M. choprai*). Bate. of Siang river Arunachal Pradesh (Females)

| S.N | Characters | Number of specimen measured | | | | | | |
|-----|--------------------------------------|-----------------------------|----------------------|----------------------|----------------------|----------------------|--------------------------|--------------------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | Total length (mm) | 87 | 110 | 87 | 108 | 115 | 122 | 110 |
| 2 | Carapace length (mm) | 19 | 23 | 19 | 22 | 24 | 29 | 26 |
| 3 | Rostrum mm) | | | | | | | |
| | <i>a- Length</i> | 18 | 21 | 20 | 21 | 24 | 24 | 24 |
| | <i>b- Post-keel length</i> | 09 | 09 | 09 | 8.5 | 11 | 09 | 08 |
| | <i>c-Rostral formula*</i> | $\frac{(2)9 + 1}{4}$ | $\frac{(3)6 + 2}{4}$ | $\frac{(2)8 + 1}{4}$ | $\frac{(2)8 + 2}{4}$ | $\frac{(2)8 + 2}{4}$ | $\frac{(2)7 + 1 + 1}{6}$ | $\frac{(2)7 + 1 + 1}{5}$ |
| 4 | Telson length (mm) | 09 | 13 | 10 | 9.5 | 12.5 | 15 | 09 |
| 5 | Antennule (mm) | | | | | | | |
| | <i>a- Pre-coxa</i> | 05 | 07 | 05 | 07 | 07 | 07 | 7.5 |
| | <i>b- Coxa</i> | 03 | 3.5 | 03 | 3.5 | 04 | 04 | 04 |
| | <i>c-Basis</i> | 03 | 04 | 03 | 3.5 | 04 | 04 | 04 |
| 6 | Eye (mm) | | | | | | | |
| | <i>Size of cornea</i> | 4.5 | 05 | 04 | 04 | 5 | 05 | 04 |
| 7 | 1st Chelipede (mm) | | | | | | | |
| | <i>a-Ischium</i> | 07 | 08 | 07 | 06 | 08 | 08 | 8.5 |
| | <i>b- Merus</i> | 08 | 9.5 | 08 | 9.5 | 9.5 | 10 | 9.5 |
| | <i>c- Carpus</i> | 09 | 11 | 09 | 13 | 11.5 | 12.5 | 11 |
| | <i>d- Propodus</i> | 02 | 5.5 | 02 | 05 | 5.5 | 06 | 5.5 |
| | <i>e- Dactylus</i> | 1.25 | 3.5 | 1.25 | 03 | 3.5 | 03 | 03 |
| 8 | 2nd Chelipede (mm) | | | | | | | |
| | <i>a-Ischium</i> | 09 | 10 | 09 | 10 | 11 | 12.5 | 10 |
| | <i>b- Merus</i> | 09 | 10 | 09 | 11 | 11.5 | 13 | 10 |
| | <i>c- Carpus</i> | 10 | 12 | 10 | 14 | 14.5 | 18 | 11 |
| | <i>d- Propodus</i> | 10 | 10 | 9.5 | 16 | 11 | 15 | 10 |
| | <i>e- Dactylus</i> | 6 | 06 | 6 | 07 | 06 | 07 | 06 |
| 9 | Periopds (mm) | | | | | | | |
| | <i>a-Ischium</i> | 4 | 05 | 04 | 05 | 06 | 06 | 06 |
| | <i>b- Merus</i> | 10 | 12 | 10 | 11 | 12 | 14 | 15 |
| | <i>c-Carpus</i> | 05 | 5.5 | 05 | 06 | 07 | 08 | 07 |
| | <i>d- Propodus</i> | 09 | 12 | 09 | 12 | 13.5 | 14.5 | 14 |
| | <i>e- Dactylus</i> | 03 | 4.5 | 03 | 04 | 4.5 | 05 | 05 |
| 10 | Uropods (mm) | | | | | 17 + 14 | 17 + 14 | 17 + 15 |

*In rostral formula Values given in parenthesis is pre-orbit teeth



availability in Siang river at D. Ering sanctuary drew the attention towards the its resistance to water current.

During the present study, a total of 13 *M.gangeticum* (Bate.) were collected in the month of November from the Siang river through the fishermen near the D'Ering sanctuary at oyiramghat. Out of thirteen, 6 were males (115mm to 148 mm size) and 7 were females (87mm to 122 mm size). Fishermen collected the specimen mostly from the cavities of logs and underside of the boulders which provided refuge to *M.gangeticum* of such places. Morphometric measurements of males and females are provided in table 1 & 2 respectively.

In present study, *M.gangeticum* was identified by presence of prominent rostral keel as more than half of the proximal end of dorsal surface of rostrum was elevated as a convex keel and bear 9 to 11 teeth. However, 2 teeth were invariably pre-orbit in position (Fig-1).

Males ranged from 115 mm to 148 mm total length with carapace length 24 mm to 35 mm. Rostral length was recorded 24 mm to 40 mm; post keel rostral length 8 mm to 11 mm and generally had 2 teeth. Ventral surface of the rostrum carried 4 to 5 teeth. Rostral formula was found to be slightly variable, ranging from $(2)7+1+1/4$ to $(2)9+1/5$ in different members. In males, carpus was longer than other segments in 1st chelipedes; while in 2nd chelipede propodus was longer than other segments. However, in periopods merus was longer than other segments. (Table-1). Females of the *M.gangeticum* ranged from 87 mm to 122 mm total length carapace length 19 mm to 29 mm. These had rostral length 18 mm to 24 mm and post keel length 8.0 mm to 11 mm. They showed rostral formula varying from $(2)8+2/4$ to $(2)7+1+1/5$ and rarely $(2)7+1+1/6$. (Table-2). In females, carpus was longer than other segments in 1st and 2nd chelipedes; while in periopods merus was longer than other segments (Table-2). Ghosh *et al.* (2006) also observed the same conclusion in *M.gangeticum*. The area under study is river course traversing the D. Ering sanctuary and has a bit more gradient (1.0 m/ 1000 m) and fast water current 0.65 ± 0.28 m/ sec in winter (Srivastava,

2006) which indicated the adaptability of the *M.gangeticum* towards the fast water current. Though, they were collected from the crevices and cavities of logs and under spaces of boulders during the winter season, its dwelling in such a fast current cannot be ignored. The availability of this at study site exhibits its extended distribution and resistance to rheic factor.

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