

Studies on sexual dimorphism in fresh water prawn, *Macrobrachium Assamense Peninsularie* from Garhwal Himalaya, India

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Abstract

The study of sexual dimorphism is very important in taxonomy, bionomics and breeding biology related research works. Mature males have proportionally small body size as well as head and claw. They exhibit a typical brood chamber formed by the first, second and third abdominal pleurae. Male prawns have a very dark blackish and brownish colour. Mature females can be easily recognized by their longer and stronger chelipeds with larger spines than in case of males. Female prawns are slight yellowish in colour with black spott mark on the all over the body parts.

Keywords: *Macrobrachium assamense peninsularie* | Sexual Dimorphism | Khoh-River

Introduction

Most of the prawn species of commercial interest belong to the *Macrobrachium* distributed in the tropical and sub tropical regions of the world (Jalihal *et.al.*, 1993). Currently, there are nearly 250 species of the *Macrobrachium* genus in the world (Short, 2004). Sexual dimorphism is very significant in biodiversity assessments and also very important in biometry, breeding biology, induced breeding, breeding, pheromone biology and other related works. Sexual dimorphisms in prawn have already been reported in different species (Koshy, 1969, 71; RajyaLakshmi, 1980; Jayachandran and Joseph, 1985, 88).

Present work deals with the sexual dimorphic nature of freshwater *Macrobrachium assamense peninsularie* (Tiwari, 1955) from Khoh River of Garhwal Himalaya, India.

Sampling Sites

Khoh-basin is geographically situated between 78.30° E to 78.40° E longitude and 29.45° N to 29.55° N latitude (Map - 1). Khoh is a spring fed perennial river in the foot hills of Garhwal Himalaya, which is formed by the confluence of two parent streams, the Langurgad (originating from the southern slopes of Dwarikhal) and the Silgad (originating from western slopes of south-east Lansdowne).

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These parent tributaries confluence near Dogadda town to form the River Khoh. Ecologically the river has two parts, the upper part with fast flowing water current and pebbly bottom surrounded by big boulders while the lower part has sandy bottom and slow speed of water current. On the way it joins other rain fed tributaries originating from south east mountain slopes of Hathikund and Kohllu Chaur. At Saneh Bhabar, the river confluent with Saneh river and enters into the Bijnor district (U.P.), and near Dhampur (Uttar Pradesh) it confluent with the major Ramganga river.



Map-1

Size Range of Prawns

During the present study of breeding biology, the total length of the prawns ranged from 3.4 cm to 6.2 cm and total weight ranged from 1.698 g to 8.494g. A total of 149 specimens were collected (66 females and 83 males). Cold water prawns prefers hilly areas with gravel, cobbles and bedrock with a little amount of sand, as the substrate.

Sexual dimorphism

In the present study a significant sexual dimorphism was noticed in the prawn *Macrobrachium assamense peninsularie*

(Tiwari, 1955). In the breeding season more females, *M. a. peninsularie* (Tiwari, 1955) are expected to associate with males, particularly in a situation where there are few males in the population. Similar results are also reported by Olatunde (1978) in cat fish. However, this was not the case with *M. vollehovenii*, which had more males in the population (Kingdom and Erondou, 2013).



Plate - 1

Subphylum	Crustacea
Class	Malacostraca
Order	Decapoda
Infraorder	Caridea
Family	Palaemonidae
Genus	<i>Macrobrachium</i>
Species	<i>Assamense</i>
Sub-species	<i>Peninsularis</i>

Mature males have proportionally small body size as well as head and claw. They exhibit a typical brood chamber formed by the first, second and third abdominal pleurae. Male prawns have a very dark blackish and brownish colour. Mature females can be easily recognized by their longer and stronger

chelipeds with larger spines than in case of males (Plate 1). Female prawns are slight yellowish in colour with black spott mark on the all over the body parts. Sexual differentiation is controlled by the presence of the androgenic hormone, which induce the male characteristics of the genital tract (Charniaux-Cotton and Payen 1985). A similar result was reported by Sharma and Subba (2005) in *Macrobrachium lamarrei* (H. Milne-Edward 1937). Sandifer and Smith (1985) also observed that fresh water mature female prawn have proportionally small body size as well as head and claw.

Koshy (1971) observed that in *Macrobrachium dayanus* the regression coefficients differ significantly in carapace length, length of rostrum and the length of the first cheliped in relation to the length of the cephalothorax between the sexes, thereby establishing the sexual dimorphism. Jayachandran and Joseph (1985) reported sexual dimorphism in *Macrobrachium scabriculum* and found that carapace length and length of telson in relation to total length and length of rostrum in relation carapace length showed significant difference at elevations. Jayachandran and Joseph (1988) noticed that the greater range of the measurement of females compared to that in males was due to the fact that the females grow to much larger size than the males. On the other hand, in many species like *Macrobrachium rosenbergii* and *Macrobrachium malcomsonii*, it is the male which grows to larger size than females.

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