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Palaemonid prawns of Purba Medinipur with two new records from West Bengal, India

Priti Ranjan Pahari[1], Mitali Das[1] and Tanmay Bhattacharya[2]

[1]Department of Zoology, Tamralipta Mahavidyalaya, Tamluk, Purba Medinipur 721 636, W.B., India
[2]Formerly of Department of Zoology, Vidyasagar University, Midnapore 721 102, West Bengal, India

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ABSTRACT

This paper reports 8 species of palaemonid prawns viz., *Macrobrachium dayanum, M. equidens, M.gangeticum, M.hendersodayanum, M.javanicum, M.tiwarii, Exopalaemon styliferus* and *Leptocarpus fluminicola* from Purba Medinipur district of West Bengal. Of these *M. hendersodayanum* and *M. tiwarii* are being recorded for first time from West Bengal and *M. javanicum* is reported for the first time from the district. Thus the total number of palaemonid species of Purba Medinipur stand to 18. It has also been suggested that *Nematopalaemon tenuipes* has gone locally extinct in this region since it has not been recorded after 1969.

Key words: *Palaemonid, Macrobrachium hendersodayanum, Macrobrachium javanicum, Macrobrachium tiwarii*

Introduction

Palaemonids being inhabitant in every kind of water bodies ranging from mountain streams to sea water, considered are integral part of freshwater, brackishwater, as well as marine ecosystem. Some species like *Macrobrachiun rosenbergii* and *Macrobrachiun malcolmsonii* are large and have great potential in aquaculture.

Purba Medinipur district (22°57′10″– 21°36′33″N and 88°21′40″- 86°33′50″E) of West Bengal has been rich source in freshwater and brackishwater palaemonid prawns. Rao *et al.* (1969) recorded 11 species of palaemonids from Hooghly estuary of West Bengal. Ramakrishna *et al.* (2003) reported these species from Digha coast of Purba Medinipur. Pahari *et al.* (2018) recorded 10 species of *Macrobrachium* from Purba Medinipur of West Bengal viz., *M.rosenbergii, M.rude, M.malcolmsoni, M.banjarae, M.lamarrei, M.idae, M.idella idella, M scabriculum, M.villosimanus* and *M.mirabile* and suggested that further in depth investigation may reveal existence of more species. This paper reports findings of a detailed survey of Purba Medinipur district conducted between February 2019 to September 2019.

Materials and Methods

This survey was conducted from February 2019 to September 2019. Prawns were collected using different types of nets like drag net, stake net, cast net, dip net, bag net, barrier net, scoop net, push net, and from ponds, rice fields, canals, rivers (Rupnarayana, Rasulpur, Haldi), estuaries, and local fishermen. After collection, the specimens were preserved in 95% ethanol. Body parts of taxonomic importance were dissected and studied under stereoscopic binocular microscope (Magnus MS 24). Specimens were measured using a sliding caliper with an ocu-

lar micrometer. Species were identified using standard literature like George (1969); Jalihal *et al.* (1975, 1984) and Jayachandran (2001).

Results

An annotated list including synonymy,diagnostic characters,distribution is given below.

Family Palaemonidae Rafinesque, 1815
Subfamily Palaemoninae Rafinesque, 1815
Genus *Exopalaemon* Holthuis, 1950

DIAGNOSIS: Rostrum with elevated dentate basal crest; carapace with branchiostegal spine and branchiostegal suture,without hepatic spine; 4th thoracic sternite without slender median process; mandible with palp; 3 posterior pairs of pereopods with dactyl simple, not biunguiculate, shorter than propodus; endopod of male 1st pleopod without appendix interna.

***Exopalaemon styliferus* (Milne Edwards, 1840)**

Materials examined : 3 males and 2 females from Sankarara canal near Tamluk (76.5 - 90 mm) 22.06.2019, 5 females from Rupnarayana river near Geonkhali (77-80 mm**)** 04.03.2019.4 males and 9 females (79-86mm) from Rasulpur river near Patuaghat, 30.04.2019.

Synonyms:
Palaemon longirostris H. Milne Edwards, 1837
Palaemon styliferus H. Milne Edwards, 1840
Leander longirostris Henderson, 1893
Leander styliferus Kemp, 1915
Palaemon (Exopalaemon) styliferus Holthuis, 1950

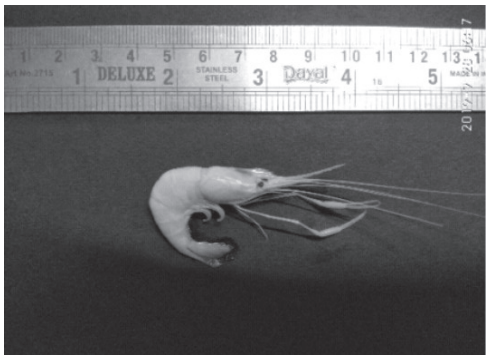


Fig. 1. *Exopalaemon styliferus*

Diagnostic Characters

Rostrum very long, extending beyond antennal scale by 1/3rd of its length, basal crest high, distal end edentate with 1 or 2 teeths; Rostral formula 6-8/8-9 with 1 post-orbitals; Carapace with antennal and branchiostegal spine and branchiostegal groove; 2nd chelate leg longer than 1st, ischium longer than merus, merus equal to carpus, carpus is half or shorter than chela; palm inflated, fingers slender and tips curved and longer than palm; endopod of male 1st pleopod without appendix interna. telson slender and elongate, 2 pairs of spines on the dorsally and 2 pairs of spines posteriorly present in telson.

Distribution

Bangladesh, India, Indonesia, Iran, Iraq, Kuwait, Malayasia, Mayanmar, Pakistan, Thailand, Vietnam
India : Maharashtra, Orissa, West Bengal
West Bengal : Darjeeling, Jalpaiguri, Paschim Medinipur, Purba Medinipur.

Remarks

This species is very common throughout the year in this district and has considerable commercial value as it is often found along with the medium sized species like *Macrobrachium equidens, Macrobrachium idella.*

Genus *Leptocarpus* Holthuis, 1950

DIAGNOSIS.: Rostrum with elevated basal crest; carapace without branchiostegal or hepatic spines, with branchiostegal suture; 4th thoracic sternite with slender median process; mandible with palp; 3 posterior pairs of pereopods with dactyl simple, shorter than propodus; endopod of male 1st pleopod without appendix interna.

Leptocarpus fluminicola (Kemp, 1917)

Materials examined : 8 ovigarous females(35-38 mm) from Natshal, 26.03.2019, 2 ovigerous females (42-45 mm) from Kolaghat.06.05.2019.2 males and 6 females (36-40 mm)
Synonym:
Leander fluminicola Kemp, 1917

Diagnostic Characters

Transparent body; Rostrum slightly longer than antennal scale, basal crest little raised, tip strongly upturned, 8-10 teeths on dorsal margin situated on basal crest, an edentate part beyond basal crest ending with 1-3 subapical teeth, lower margin with 3-5 teeth; carapace with only antennal spine and distinct branchiostegal groove; antennal scale well developed, outer margin ends with a sharp spine

which overreached by lamella; 2nd pereiopod longer than 1st, ischium shorter than merus, carpus longer than merus and chela, chela spoon shaped, fingers equal to palm; telson triangular, 2 pairs of spines on dorsal surface and 2 pairs of spines on posterior end, inner pair overreaching the tip; uropodal exopod with accessory spine.

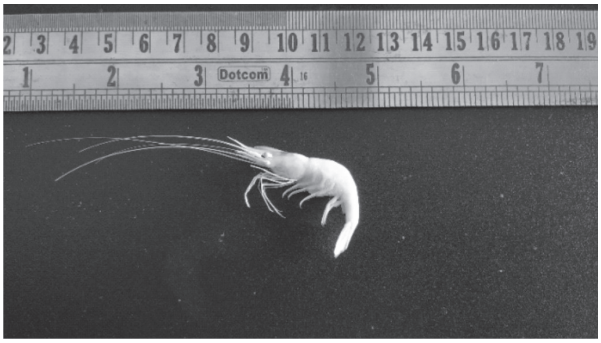


Fig. 2. *Leptocarpus fluminicola* female

Distribution: India, Myanmar
India : Kerala, West Bengal
West Bengal : Hooghly estuary, Matlah estuary, Purba Medinipur

Remarks

This species is very common during the spring (February, march), and late monsoon (September). Ovigerous females from spring are larger then those found in september.

Genus *Macrobrachium* Bate, 1868

DIAGNOSIS.: Rostrum rarely with elevated basal crest; carapace without branchiostegal spine, with hepatic spine, and branchiostegal suture; 4th thoracic sternite with median process; mandible with palp; 3 posterior pairs of pereopods with dactyl simple, shorter than propodus; endopod of male 1st pleopod without appendix interna.

***3.Macrobrachium dayanum* (Henderson, 1893)**

Materials examined : 6 females from Patashpur (45-52 mm) 13.07.2019, 3 males from Radhamoni (60-62 mm)11.04.2019,11 females from Radhamani, 10.04.2019
Synonyms:
Palaemon dayanus Henderson, 1893
Macrobrachium dayanum Holthuis, 1950

Diagnostic characters **:** Rostrum reaching tip of antennal scale, tipupturned, rostral formula 8-11/6-7 with 2-3 post orbitals; Carapace with antennal and

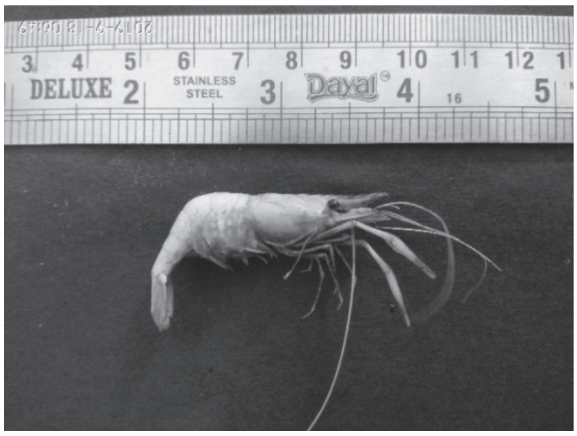


Fig. 3. *Macrobrachium dayanum* female

hepatic spines, latter smaller, situated below, spotted with dense dark brown pigment: antennular and antennal flagella pigmented; 2nd pereiopods equal or subequal, 1/2 tio 1/3 of body length, chela larger than carpus palm compressed, fingers equal, pubescent, 2/3 as long as palm, with conspicuous longitudinal ridges: Fixed finger with one conical teeth and 3-4 denticles proximally, movable finger with large proximal teeth: Chelipeds prominently banded with stripes of dark brown pigment; body is pigmented irregularly.

Distribution: Bangladesh, India, Indonesia, Mayanmar

India : Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, West Bengal.
West Bengal: Howrah, Hooghly, Kolkata, Purba Medinipur
Remarks: *Macrobrachium dayanum* is purely freshwater species but not common in Purba Medinipur district like other freshwater species of *Macrobrachium.*

***Macrobrachium equidens* (Dana, 1852)**

Materials examined**:** 7 females (62-64 mm) amd 1 male (85 mm) from fish market near Kolaghat 01.07.2019,5 females (60 -62 mm) from Natshal , 16.05.2019

Synonym:

Palaemon equidens Dana, 1852

Diagnostic characters
Rostrum reaching beyond the level of distal end of

antennal scale, dorsal margin convex or slightly sinuous, tip distinctly upcurved, rostral formula: 2-3 + 8-9/4-7, dorsal teeth unequally spaced, usually with wider gaps near posterior and anterior ends of rostrum; branchiostegal suture not extending posteriorly beyond hepatic spine; telson with posterior apex not over reaching posterolateral spines; 1st pereiopod with chela '/2 as long as carpus; 2nd pereiopods subequal in length, similar in form, palm subcylindrical, fingers covered with soft, dense pubescence, not dentate on opposable margins, not gaping (in full-grown males), about 0.75-0.80 as long as palm, without pubescence, chela longer than carpus, palm 0.67-0.75 as long as carpus, carpus 0.6 to 0.8 times as long as merus,without longitudinal grooves; 3rd pereopod overreaching antennal scale by length of dactyl, propodus partially pubescent, not covered with spines or scales.

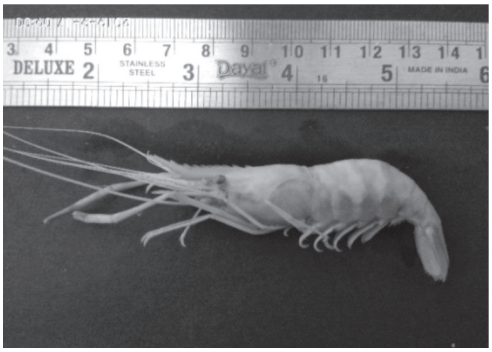


Fig. 4. *Macrobrachium equidens*

Distribution

Borneo, China, Fiji, India, Indonesia, Madagascar, Malayasia, Mozambique, Nigeria, Papua New Guinea, Philippines, South Africa, Sri Lanka, Thailand, Vietnam
India : Andaman and Nicober islands, Andhra Pradesh, Goa, Kerala, Maharashtra, Orissa, Puducherry. West Bengal,
West Bengal: Hooghly, South 24 Paragana, Purba Medinipur

Remarks

This species is closely related to *M.idae, and M.idella idella.* But is easily distinguishable by the colour on second pereiopods and velvety pubescence. It reproduces in brackish and sea water, often found in estuaries near sea mixed with penaeid prawns. Common but never found in huge amount. It is marketed fresh, consumed locally, and has an moderate economical value.

***Macrobrachium gangeticum* (Bate, 1868)**

Materials examined: 2 females (115 and 123 mm) from Kolaghat, .04.07.2019

Synonym:

Palaemon choprai Tiwari, 1947

Diagnostic characters

Rosrum not reaching the tip of antennal scale, basal crest very high like keel, rest are directed forward, adrostral carina very prominent: 1st pereiopod reaching beyond antennal scale by 1/3 of carpus, palm longer than fingers; 2nd pereiopod longer than first pair, merus as long as palm, carpus slender than merus, slightly thickened distally, and shorter than chela, palm cylindrical, longer than fingers, movable finger incurved at tip, with 2 conicle denticles in proximal part and covered with pubescence except the cutting edge and distal tip, fixed finger sparsely spinulose, pubescent along dorsal and ventral surfaces, with 1 very prominent denticle that fits in between denticles of movable fingers; Base of telson is broad and tip is acute, 2 pairs of dorsal spine and 2 pairs at distal end. Inner pair of distal spines longer than outer pair but not reaching the tip of telson.

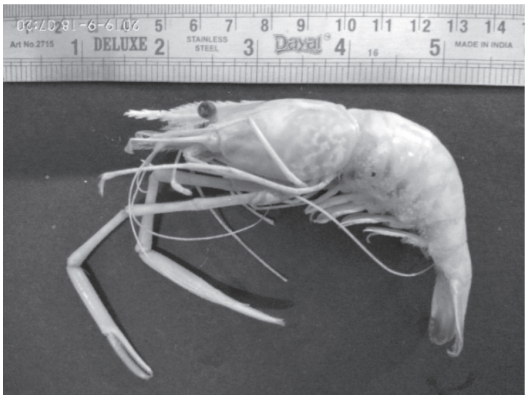


Fig. 5. *Macrobrachium gangeticum*

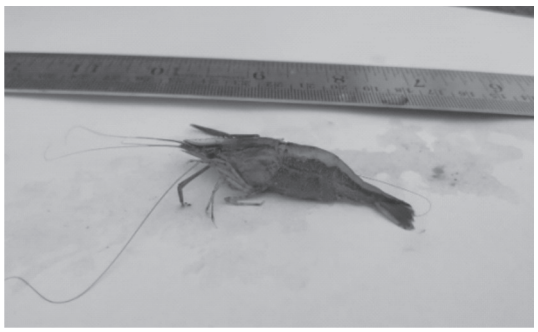
Distribution

India, Bangaladesh
India : Arunachal Pradesh, Assam, Bihar, Uttar Pradesh, West Bengal
West Bengal: Maldah, Murshidabad, Purba medinipur
Remarks: *Macrobrachium gangeticum* belongs to the largest group of *Macrobrachium* along with *M.rosenbergii* and *M. malcolmsonii.* Being exclusively freshwater species, it is very much available in

middle and upper stretch Ganga river system, and cultured commercially (Kanaujia *et al.*, 2005), but is rare in this district.

***Macrobrachium hendersodayanum* (Tiwari, 1952)**

Materials examined**:** 1 male and 3 frmales (47- 56 mm) from Ghatal 18.03.2019, 2 females from radhamani (54-57mm) 26.02.2019,4 berried females from fish market near Tamluk (56-57)**,** 09.09.2019**.**
Synonym:
Palaemon hendersodayanus Tiwari. 1952
Diagnostic characters
Rostrum as long as the antennal scale, deep in mid section, upper margin straight with 6-9 equidistant teeth wuth 2 post-orbitals, ventral margin with 2-4 teeth, triangular in profile; carapace smmoth with 2-3 small dark violet or black patches; 1st chelate keg extending upto tip of antennal scale, carpus 2 times as long as chela; 2nd chelate leg subequal, 0.4 -0.6 times as long as total body length, ischium subequal to merus, carpus as long as merus, palm longer than fingers and slightly compressed, inner margin of fingers with velvety pubescence along 1/4 -3/4 its length, hairs arise in shallow, spherical or elliptical pits; colouration: Background body colour is orange or yellowish-brown with deep violet stripes or patches in pleura of all abdominal segments, tip of the rostrum, antennal scale, Small bands on segments of second cheliped inclusive of fingers.



6(a)

6(b)

Fig. 6. *Macrobrachium hendersodayanum* (a) Lateral view. (b) Dorsal view

Distribution

Native to India - Karnataka, Maharashtra, Himachal Pradesh, West Bengal
Remarks : This species is being recorded for the first time from West Bengal. It is rather rare in this district. Morphological characters and measurement of specimens found here agree fully with the morphological description by Jayachandran (2001) but varies in some ways from colour description given by Jalihal and Sankolli, (1975). In these specimens examined, some additional variations like a prominant stripe of deep violet or black colour along the ventral rostral margin, small patches on the basal sengment of antennular peduncle are also noted.

Usually it is known as a hill stream prawn species, but the present record indicates it may be found in the coastal zone at 10 m mean sea level.

Not popular in local fisheries due to its colour pattern.

***Macrobrachium javanicum* (Heller, 1862)**

Materials examined: 2 males (64-72 mm) and 3 females (60-62mm) from Sankarara canal near Tamluk 23.02.2019,4 females (58-61mm) from Haldi river near Haldia.
Synonyms:
Palaemon javanicus Heller, 1862
Palaemon acutirostris De Man, 1888
Palaemon (Eupalaemon) equidens De Man,1888
Palaemon equidens Lanchester, 1901
Palaemon neglectus Kemp, 1918
Macrobrachium neglectus Suvatti, 1937
Macrobrachium javanicum Holthuis, 1950

Diagnostic characters.: Rostrum not reaching level of distal end of antennal scale, dorsal margin sinuous, rostral formula: 3 + 8-10/3-5, dorsal teeth subequally spaced, except Posteriormost post orbital tooth; branchiostegal suture not extending posteriorly beyond hepatic spine; antennal scale with lateral margin nearly straight; 1st pereiopod with chela half as long as carpus; 2nd pereiopods subequal in lengthand similar, palm slightly compressed, fingers without dense pubescence, dentate on opposable margins, not widely gaping, 0.5-0.6 as long as palm, palm not pubescent, chela twice as long as carpus, palm longer than carpus in longer cheliped but equal to the shorter, carpus longer than merus,

without longitudinal grooves; 3rd pereopod overreaching antennal scale by less than length of dactyl, propodus notcovered with spines or scales: tip of telson not over reaching posterolateral spines; Uropodal exopod with accessory spine.

Fig. 7. *Macrobrachium javanicum*

Distribution: India, Indonesian archipelago, Java, Malayasia, Mayanmar, Singapore, Thailand.
India: Kerala, Tamilnadu, West Bengal
West Bengal: Paschim Medinipur, Purba Medinipur

Remarks

This species is very rare in Purba Medinipur district previously reported from Paschim Medinipur district of West Bengal by Chanda, 2014. It is being reported for the first time from Purba Medinipur district.

***Macrobrachium tiwarii* (Shenoy Sankoli, 1988)**

Materials examined**:** 9 males and 13 females (36.5 to 42 mm) from wetlands near Sankarara canal near, 10 females from Haldia.
Synonyms:
Palaemon (Eupalaemon) danae Nobili,1903
Palaemon (Eupalaemon) ritsemae Roux, 1931
Palaemon kistnensis Tiwari, 1952

Diagnostic characters

Rostrum extending slightly beyond the tip of antennal scale, dorsal margin straight, slightly convex above orbit, rostral formula 8-11/3-4 with 1-2 postorbitals, dorsal teeths arranged in groups, separated by wide gaps, proximal group with 3-4 equidistant teeths, followed by a group of 3-4 equidistant teeths and a distal group of 2 smaller teeths, ventral margin with 3-5 equidistant teeths; 1st pereiopod reaching the level of antennal scale. carpus 2.0 -2.4 times as long as chela, 1.0 -1.3 times as long as merus; 2nd pereiopod is half as long as total body length, reaching antennal scale by 1/4th of distal carpus, chela, merus, horter than carpus, fingers 0.7-0.8 times as long as palm, small gap when closed; telson slender, slightly extending beyond level of outer lateral spine of uropodal exopod: appendix masculina of 2nd pleopod in male 1.8-1.9 times longer the appendix interna, 0.6 length of endopod, fringed with spine like setae along inner margin and with 1 long and 2-4 sub-equal shorter and stiff but smooth setae distally; accessory subapical spine absent in uropodal exopod.

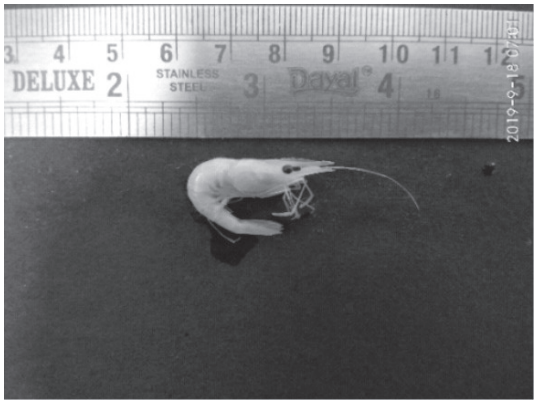


Fig. 8. *Macrobrachium tiwarii*

Distribution

Native to India. Found in Karnataka,Tamilnadu and West Bengal.
Remarks: This species is found in Purb Medinipur district in freshwater bodies associated with other closely related like species *Macrobrachium lamerrei lamerrei*, but it can be easily distinguished by rostral pattern, rostral length, appendix masculina. This is rather rare and is recorded for the first time record from West Bengal.

Genus *Nematopalaemon tenuipes*

DIAGNOSIS- Rostrum with elevated basal crest; carapace with marginal branchiostegal spine, without branchiostegal suture or hepatic spine; mandible with palp; 3 posterior pairs of pereopods with dactyl simple, not biunguiculate, longer than propodus; 1st pleopod of male without appendix interna on endopod.

Nematopalaemon tenuipes

Synonyms :
Leander tenuipes Henderson, 1893

Palaemon luzonensis Blanco, 1939
Palaemon (Nematopalaemon) tenuipes. Holthuis, 1950
Nematopalaemon tenuipes. Holthuis, 1980

Diagnostic characters

Rostrum overreaching antennal scale, rostral formula: 1-3 + 3 + 1/2-6; 6th abdominal somite no more than 2/3 as long as postorbital carapace length, 2nd pereiopod mostly reaching beyond antennal scale by chela, carpus shortest segment, palm strongly inflated, fingers slender, last three pereiopods slender, elongate, non chelate, dactyls more than twice length of propodus.

Distribition

China, India, Myanmar, New Zealand, Phillipines, Somalia, South Africa, Taiwan, Thailand.
India: Andhra Pradesh, Gujarat, Maharashtra, West Bengal.
West Bengal: Hooghly estuary (Hooghly). Roopnarayan river and Digha coast (Purba Medinipur), Matlah estuary (South 24 Parganas)

Remarks

This species since previously reported from Purba Medinipur district (previously a part of Medinipur district) by Rao (1969) from Roopnarayana estuary and Rmakrishna *et al*. (2003) from Digha coast has been included here but no specimens could be found by us during our survey.

Discussion and Conclusion

Rao (1969) recorded 11 species of palaemonid prawns, 8 species of *Macrobrachium* and one species each of *Exopalaemon, Leptocarpus,* and *Nematopalaemon* from Hooghly estuary in West Bengal. These species have been also included in the list of marine invertebartes of Digha coastal region by Ramakrishna *et al*. (2003). Pahari *et al.* (2018) added two more species of *Macrobrachium* to the list. As such total number between recorded species of palaemonid prawn from Purba Medinipur district was 13. Present paper records 6 more species of *Macrobrachium* viz., *M. dayanum, M.equidens, M. gangeticun, M. hendersodayanum, M.javanicum* and *M. tiwarii* from Purba Medinipur district. So it may be concluded that this district has 19 species of palaemonid prawns including 16 species of *Macrobrachium* and one species each of *Exopalaemon, Leptocarpus, Nematopalaemon.* Of these *M.hendersodayanum* and *M. tiwarii* are being recorded for the first time from West Bengal and *M.javanicum* is reported for the first time from Purba Medinipur district. However, since no one after Rao (1969) has recorded *Nematopalaemon tenuipes* (Henderson, 1893) from this region and it has also not been recorded in the present study, it appears that this species has gone locally extinct.

Acknowledgement

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