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RESEARCH ARTICLE

A REVISION TO THE FIRST RECORD OF THE GENUS *MIYADIELLA* KUBO,
1949 FROM INDIAN WATER

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ABSTRACT

The genus *Miyadiella* was described by Kubo (1949) represents two species namely *Miyadiella podophthalmus* (Stimpson, 1860) and *Miyadiella ornate* Holthuis, 1955b. The validity of the genus was questioned by Starobogatov (1972), Holthuis (1980) and Burkenroad (1983). Type species of the genus *Miyadiella pedunculata* Kubo, 1949 was synonymised under *Penaeus podophthalmus* Stimpson, 1860 by Starobogatov (1972) and the genus was synonymised under *Atypopenaeus* created by Alcock, 1905. But Hayashi (1992) strongly stated that long eyestalk is the typical character for the genus *Miyadiella*. Pérez-Farfante and Kensley (1997) also supports Hayashi's view and tentatively keeps separate *Miyadiella* from *Atypopenaeus* by adding two additional typical characters for the genus i.e., presence of spinules on first rostral teeth as well as along the postrostral carina and relatively short fifth pereopod. During the present study author got the opportunity to study the materials preserved in Central Marine Fishery Research Institute (CMFRI), Cochin, Tamilnadu, India [Reg. No. AR. 267, from Bombay, collected by Kunju and labeled as *Atypopenaeus stenodactylus* (Stimpson, 1860)] and arrived into conclusion that the specimen will be *Miyadiella podophthalmus* (Stimpson, 1860).

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INTRODUCTION

Among a variety of edible decapod crustaceans, prawns contribute largely to the fishery wealth of many nations. Exploitation of prawn resource from the seas around each country is playing increasingly significant role in furthering their national economy. In recent years, in spite of some ecological hazards, the demand for prawns and prawn products has increased so much that every country is making efforts to utilize hitherto unknown but usable stocks and expansion of prawn fisheries and industries near coast line is rightly being given the maximum encouragement in the development programme of each nation. In India, with the introduction of mechanization and due to the development of efficient export industries, prawn fishery has substantially improved during last three decades. The foreign exchange earnings by export of prawns and prawn products from the country has grown up considerably. In short, as in every prawn fisheries together with all the segments of the industry concerned with prawn products export are playing increasingly prominent role in the economy of the country. Given this economic significance and the fact that penaeid prawns occur in a wide variety of shallow – water

marine, estuarine and back water habitats, knowledge on the ecology, feeding, reproduction, lifecycle, fecundity, prey predator relationship, behavior, population dynamics and fisheries potentials have vastly increased over the last three decades. The knowledge of the systematics of prawns is an essential prerequisite for their wise management and exploitation. Earliest contribution on the penaeid prawn from Indian water was by Fabricius (1798). Some important contributions on the prawns of this region during nineteenth century were by Milne Edwards (1837), Miers (1878), Bate (1888), Wood-Mason (1891), Wood-Mason and Alcock (1891), Alcock and Anderson (1894, 1899). Alcock (1901, 1905, 1906) and George (1979) was the taxonomist of twentieth century who tried to make a comprehensive study on the penaeid taxonomy. Beside these there are so many taxonomic works on the group like by Fisher and Beanchi (1983), Paulinose (1986), Achuthankutty and Parulekar (1986), Reddy (1995), Pathan and Jahlihal (1997), Chanda and Bhattacharya (2002, 2003, 2004, 2009, 2014), Chanda and Roy (2004, 2005), Chanda (2014a, 2014b, 2014c, 2015). In spite of these work, there are some lacuna on the penaeid systematics and distribution of Indian region. So, present work is an attempt to fill up one of such lacuna found by the author on genus *Miyadiella* Kubo, 1949 during the study. Present study reveals that Indian water represents only one species of the genus

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Miyadiella Kubo, 1949 i.e., *Miyadiella podophthalmus* (Stimpsons, 1860) recorded by Kunju (1967) from Maharashtra as *Atypopenaeus stenodactylus* (Stimpson, 1860). Apparently, *Atypopenaeus stenodactylus* and *Miyadiella podophthalmus* shows morphologically similar due to delicate body, integument with setae; rostrum short, reaching beyond middle of first antennular segment, armed only with dorsal teeth; epigastric tooth separated from first rostral tooth; carapace with rounded orbital angle, antennal spine short, post-orbital sulcus rounded, hepatic spine short, pterygostomian spine absent. But closure examination shows that structure of petasma, thelycum, long eye stalk, spinules on first rostral tooth and post rostral carina are the distinguishing characters of *Miyadiella podophthalmus*.

MATERIALS AND METHODS

The present study is mainly based on the observation of specimens preserved in the general collection of CMFRI, Cochin, Tamilnadu (Reg. No. AR. 267, from Bombay, collected by Kunju). The materials preserved in rectified spirit (90%) were studied under a stereoscopic binocular microscope. The detailed synonymies have been furnished to the genus and species and also their diagnosis, distribution, taxonomic remarks have been furnished. In addition an attempt has been made to include a comprehensive coverage of the references in the reference section. For all citations of taxon author's name and year of publication has been given. A brief history, diagnosis and distribution of the species are dealt separately in results and discussion section.

RESULTS AND DISCUSSION

Genus *Miyadiella* Kubo, 1949

The genus *Miyadiella* was created by Kubo (1949) with *M. pedunculata* as type from Osaka-Wam, Japan. The genus was first recorded from India by Kunju (1967) from Maharashtra, West Coast of India as *Atypopenaeus*. A brief history with special reference to Indian contributions are listed below.

- 1860 *Penaeus* Stimpson, Proc. Acad. nat. Sci. Philad., 12 : 43.
 1949 *Miyadiella* Kubo, J. Tokyo Coll. Fish., 36 (1): 105, 264;
 Dall *et al.*, 1990, Adv. Mar. Biol., 27: 1-489.
 1967 *Atypopenaeus* Kunju, Symp. Ser. Mar. Biol. Assoc. India,
 (i) Pt. 4: 1382-1397; Kurian and Sebastian, 1993, Hindustan
 Publ. Corpor. Delhi : 81.

Type Species: *Miyadiella pedunculata* Kubo, 1949, J. Tokyo Coll. Fish., 36 (1): 264 [= *Penaeus podophthalmus* Stimpson, 1860, Proc. Acad. Nat. Sci. Philad., 12: 43].

Type Locality: Osaka-Wam, Japan.

Diagnosis of the genus

Integument with setae; rostrum short, not reaching distal margin of first antennular segment, with dorsal teeth only; epigastric tooth markedly separated from first rostral tooth; spinules on first rostral teeth; orbital spine absent, antennal spine prominent; pterygostomian angle blunt; hepatic spine sharply pointed; postrostral carina extending to about midlength or three-fourths of carapace, bearing rows of minute spinules; post-ocular sulcus well marked, sulcus variable in

size; hepatic sulcus and carina distinct anteriorly, extending anteroventrally, indistinct posteriorly; branchiocardiac carina long, indistinct; longitudinal and transverse suture absent; sixth abdominal somite without cicatrices; telson elongate without spine, with few spinules and several, elongated, plumose marginal setae; eye extremely elongate, reaching upto midlength of third antennular segments; parapenaeid spine absent; first and second antennular segments elongated, flagella subequal, dorsal one slightly longer than ventral, shorter than carapace; basal spine present on second and third segment may be absent in first; ischial spine present on first, second and third pereopod; petasma semi-open, symmetrical, median and lateral lobes simple, not folded, median lobe bearing moderately broad proximal projection, lateral lobe long; thelycum open, with broad anteromedian spine on sternite XIV, preceded by rounded scales with elongate flap like lateral plates; median protuberance of sternite XIII either short, sometimes extending upto sternite XIV.

Remarks

Miyadiella and *Atypopenaeus* are two closely related genera which are difficult to distinguish. Pérez-Farfante and Kensley (1997) supported Hayashi's (1992) observation of long eye stalk, as the typical character of the genus *Miyadiella* and added some additional characters like – spinules on first rostral tooth and post rostral carina, which is also typical to *Miyadiella*, and furthermore relatively shorter fifth pereopod are sufficient to separate the two genus. In India the genus *Miyadiella* is very rare and till date only one species *Miyadiella podophthalmus* (Stimpson, 1860) is known from India.

Miyadiella podophthalmus (Stimpsons, 1860)

M. podophthalmus was originally described by Stimpsons (1860) from Hong Kong as *Penaeus podophthalmus*. Hayashi (1992) transfer the species to genus *Miyadiella*. The species was first recorded from India by Kunju (1967) from Maharashtra, West coast of India as *Atypopenaeus stenodactylus*. A brief history of the species with special references to Indian contribution are given below.

- 1860 *Penaeus podophthalmus* Stimpson, Proc. Acad. nat. Sci.,
 Philad., 12 : 22-47; Alcock, 1906, Cat. Indian Dec. Crust.
 Part-III Mac. Fas 1 : 1-55.
 1967 *Atypopenaeus stenodactylus*, Kunju, Symp. Ser. Mar.
 Biol. Ass. India, (i) Pt. 4 : 1382-1397; Kurian and
 Sebastian, 1993, Hindustan Publ. Corpor., Delhi : 81.
 1992 *Miyadiella podophthalmus* Hayashi, Dendro. Crust.
 Japanese waters, Tokyo: 1-300.

Type Species : *Penaeus podophthalmus* Stimpson, 1860, Proc. Acad. nat. Sci., Philad., 12 : 22-47.

Type Locality: Hong Kong.

Material Examined

No specimens were collected during present study but author examined one male (62 mm.), CMFRI Reg. No. AR. 267, from Bombay, collected by Kunju (1967).

Diagnosis of the species

Integument with setae; rostrum short, reaching beyond middle of first antennular segment, armed dorsally with 7+1 teeth;

epigastric tooth separated from first rostral tooth; spinules on first rostral teeth; carapace with rounded orbital angle, antennal spine short, post-orbital sulcus rounded, hepatic spine short, pterygostomial spine absent; post rostral carina extending upto midlength of carapace, bearing rows of minute spinules, first rostral tooth also bearing minute spinules; cervical sulcus short, cervical carina marked; hepatic sulcus and carina marked anteriorly, anteriorly curved downwards, branchiocardiac carina long, not prominent; telson armed with three pairs of lateral spines; eye extremely elongate, reaching upto midlength of second antennular segment; antennular flagella subequal, dorsal one longer; basal spine present on second and third pereopod, ischial spine on first, second and third pereopod; fifth pereopod reaching to the end of basal third of the scaphocerite; petasma semi-open, symmetrical, with minute cincinnuli along dorsomedian margin; median and lateral lobes simple, not folded, median lobe bearing moderately broad proximal projection, lateral lobes, long rather flexible costa; thelycum open, bearing basally broad anteromedian spine on sternite XIV, preceded by elongate flap like lateral plates.

Remarks

Material examined agree completely with the description of *M. podophthalmus* (Stimpson, 1860) and hence, *A. stenoductylus* as recognised by Kunju (1976) has been regarded as *Miyadiella podophthalmus* in the present study and Kunju was the scientist who collected the specimen of genus *Miyadiella*, first time from Indian water.

Distribution

India: Maharashtra, West coast of India.
Elsewhere: South China sea; Japan; Hong Kong.

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