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First record of the callianassid ghost shrimp *Neocallichirus jousseaumei* (Nobili, 1904) (Decapoda: Axiidea) from India

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Abstract: From India, two species of the callianassid ghost shrimp genus *Neocallichirus* Sakai, 1988 are known. In this study, *Neocallichirus jousseaumei* (Nobili, 1904) is first recorded from India based on a single specimen collected from intertidal zone of Diu coast. A brief description for giving evidence of the identification and notes on habitat is presented.

Keywords: Callianassidae, description, Indian coast, new record.

Callianassid ghost shrimp (Decapoda: Axiidea) is among the most common burrowing organisms in littoral and sublittoral soft sediments (Sakai 1999). The global diversity of the Axiidea contains 465 species classified into 128 genera and 14 families in the world, although taxonomy of those taxa is still in a state of flux (Dworschak 2015). Sakai (2011) recognized 29 species in the genus *Neocallichirus* Sakai, 1988 whereas currently 62 valid species (38 living and 24 fossils) have been recorded from different regions of the world until now (WoRMS Editorial Board 2018). From India, several authors have reported upon callianassid fauna (e.g., Alcock & Anderson 1894, 1899; Sakai 1999, 2005). With regard to the genus *Neocallichirus* Sakai, 1988, two species, viz., *Neocallichirus audax* (de Man, 1911) and *N. rathbunae* (Glaessner, 1929) have been reported from the country (Rao & Kartha 1966; Sakai 1999). In this short communication, we record *N. jousseaumei* (Nobili 1904) from India for the first time on the basis of a single specimen from Diu coast. A brief description evidencing the identification and notes on the habitat are presented.

Materials and Methods

The intertidal zone of Diu (Union territory) coastal area is composed of different habitats, such as mangroves, sandy mud, mud, sand and rock with tidal pools. The specimen was collected from the Khukri on 16 October 2015 during rainy season in the upper intertidal of sandy-mud zone, under cobbles. It was collected and preserved in 10% buffered formalin solution. It was deposited in the museum of the Department of Life Sciences, Maharaja Krishnakumarsinhji Bhavnagar University, Bhavnagar (Voucher/Museum ID: LSAIAT21). The specimen was identified using keys of Sakai (1999, 2011) and the redescription of *N. jousseaumei* by Dworschak (2011). Size of the specimen is indicated

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by carapace length (cl) measured from the tip of the rostrum to the midpoint of the posterodorsal margin of the carapace and the total length measured from the tip of the rostrum to the midpoint of the posterodorsal margin of the telson. Measurements were taken with vernier caliper. Other abbreviations used in the text are: Plp1 - first pleopod; Plp2 - second pleopod.

Result and Discussion

Systematics

Class Malacostraca Latreille, 1802
Order Decapoda Latreille, 1802
Suborder Pleocyemata Burkenroad, 1963
Infraorder Axiidea De Saint Laurent, 1979
Family Callianassidae Dana, 1852
Genus *Neocallichirus* Sakai, 1988

Neocallichirus jousseaumei (Nobili, 1904) (Image 1 A–C)

Material Examined: Reg. no. LSAIAT21, 16.x.2015, 1 male, tl 69.2mm, cl 20mm, Khukri coast, Diu (20.703^{0}N & 70.976^{0}E), upper intertidal zone of sandy/muddy beach, coll. Imtiyaz Beleem.

Description: Carapace as long as pleomeres 1 and 2 combined, with distinct linea thalassinica extending over entire length; rostrum broadly rounded in dorsal view, not reaching midlength of eyestalks, but reaching beyond lateral projections; anterolateral projections obtuse; dorsal oval distinctly defined with deep transverse cardiac furrow, extending anteriorly just above linea thalassinica as shallow grooves, acrossing postrostral region. Epistome bearing dense tuft of long setae on each subantennular region.

Eyestalks contiguous, narrowing distally to minutely denticulate terminal margin; no conspicuous terminal process. Cornea black, situated dorsolaterally in distal half of eyestalk, about 1/2 width of eyestalk; proximal area of cornea filled with black pigmentation. Antennular peduncle 2.5 times as long as carapace. Antennal peduncle longer and more slender than antennular peduncle.

Third maxilliped with ischium-merus subquadrate, about 1.1 times as long as wide; distal margin of merus obliquely truncate; propodus approximately as long as wide, with strongly convex lower margin.

Chelipeds distinctly unequal and dissimilar. Major cheliped massive; ischium with row of minute denticles proximally on inferior margin; merus widest proximally, with convex, denticulate blade on inferior margin; carpus slightly shorter than merus, distinctly higher than long, with straight superior and convex inferior margins; palm much longer than carpus and about as long as high, with low but sharp keel in proximal half of superior margin, inferior margin of palm weakly serrated; fixed finger slightly curved, cutting edge with low tubercles proximally; dactylus curved, slightly longer than fixed finger. Minor cheliped relatively stout; ischium with row of minute denticles proximally on inferior margin; merus unarmed; carpus as long as high; palm slightly longer than high; fixed finger shorter than palm; dactylus slightly curved; cutting edges of fixed finger and dactylus smooth, without conspicuous armature.

Second pereopod and fifth pereopods without distinctive features. Third pereopod with propodus subquadrate, heel subtruncate, not much produced. Fourth pereopod semicheleate; propodus with fixed finger reaching midlength of dactylus. Pleomere 6 with lateral constriction at about two-thirds length. Male first pleopod uniramous, consisting of two articles (Image 1D); second article longer than first, biramous with rounded lobe and acute hooked tip distally (Image 1E). Uropodal endopod slightly longer than telson, subrhomboidal, about as long as wide; exopod longer than endopod, with anterodorsal plate. Telson subtrapezoidal, narrowing posteriorly, about 1.2 times as wide as long; posterior margin gently convex, unarmed.

Color in life: Transparent with tinge of pink on the pleon and chelipeds.

Habitat: *Neocallichirus jousseaumei* (Nobili, 1904) occurs widely in boulder or lime stone rocks (carbonate rock) and sand to muddy-sand sediments (Sepahvand et al. 2012, 2014). In coastal area of Diu, we collected the specimen in upper intertidal zone of which the substrate consisting of muddy sand and boulders (Image 2A,B).

Distribution: Widely distributed in the Indo-West Pacific: Mauritius (Kensley 1976); Kangeang Reef, Bay of Kankamaran, Djibouti, Gulf of Aden, Red Sea (type locality; Nobili 1904, 1906), Socotra and Persian Gulf (Sakai & Apel 2002; Sepahvand & Sari 2010, Sepahvand 2014); Qeshm Island and Gulf of Oman (Sepahvand et al. 2012); Pakistan (Naderloo & Türkay 2012); Thailand, Philippines (Dworschak 2011); Cocos (Keeling) Islands (Dworschak 2014); Indonesia (de Man 1905; Sakai 2005); Tuamotu, French Polynesia, Ryukyu Islands, Japan (Sakai 1999; Sepahvand et al. 2018), India (new record).

Remarks

Diagnostic characters of the specimen examined agrees well with the description of *N. jousseaumei* given by Dworschak's (2011). The shape of male first and second pleopods of our specimen resembles that of the lectotype of *C. jousseaumei* Nobili, 1904

Image 1. ***Neocallichirus jousseaumei*** **(Nobili, 1904). (A) dorsal view, (B) ventral view, (C) lateral view, (D) first pleopod, (E) second pleopod. Scale bar = 1cm. © Imtiyaz Beleem & Paresh Poriya.**

(MNHN Th 83). The synonymization of *N. indicus* with *Neocallichirus jousseaumei* (Nobili, 1904) by Dworschak' (2011) "a serious error; for *jousseaumei* it should read 'senior' instead of 'junior' as evidenced by date of authors and text of the paper" (Naderloo & Türkay 2012).

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Image 2. A - Khukri beach; B - *Neocallichirus jousseaumei* (Nobili, 1904) in sandy habitat. © Imtiyaz Beleem.

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