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**SHORT COMMUNICATION**

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Piyush Vadher, Hitesh Kardani, Prakash Bambhaniya & Imtiyaz Beleem

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# First record of ghost shrimp *Corallianassa coutierei* (Nobili, 1904) (Decapoda: Axiidea: Callichiridae) from Indian waters

**Piyush Vadher [1], Hitesh Kardani [2], Prakash Bambhaniya [3] & Imtiyaz Beleem [4]**

[1,2,3] Fisheries Research Station, Junagadh Agricultural University, Sikka, Jamnagar, Gujarat 361140, India.
[4] Office of the Superintendent of Fisheries, (Commissioner of Fisheries, Agriculture, Farmer Welfare and Co-operation Department) Fisheries harbour area, Mangrol, Gujarat 362226, India.
[1] vadherpiyush4@gmail.com, [2] hiteshkardani@gmail.com (corresponding author), [3] prakashbambhaniya72@gmail.com, [4] imtiyazbelim7@gmail.com

**Abstract:** A Callichiridae ghost shrimp species *Corallianassa coutierei* (Nobili, 1904) is recorded and described here for the first time from the Indian waters. Formerly, five species under the family Callichiridae were recorded from different coastal waters of India. In addition, *C. coutierei* was infested with several copepods. Additional description of *C. coutierei* with key characters and distribution status is given for this species. A comprehensive checklist of the infraorder Axiidea is prepared based on previous records from Indian waters.

**Keywords:** Checklist, copepods, new record, Goose reef, Gulf of Kachchh, Gujarat.

Axiidea de Saint Laurent, 1979, an infraorder of Decapoda is also known as ghost shrimp, mud shrimp or burrowing shrimp (Dworschak et al. 2012), although they are only distantly related to true shrimp, they are ecologically and morphologically adapted as burrowing forms (Dworschak 2015). Axiidea is the infaunal organisms that build complex burrows, found in marine and estuarine areas of bays (Golubinskay et al. 2016). Axiidea comprises a total of 11 valid families (WoRMS 2020a) dwelling in shallow water of intertidal or subtidal water (less than 200 m or 660 ft). Axiidea comprises 19 species belonging to five families and 16 genera, distributed in the Indian waters (Table 1). Family Callichiridae comprises of 96 species belonging to 17 genera worldwide (WoRMS 2020b).

The ghost shrimp genus *Corallianassa* was described by Manning in 1987 from America (family: Callianassidae Dana, 1852). The genus *Corallianassa* comprises 13 species in the World (WoRMS 2020c). A scrutiny of literature pertaining to ghost shrimps of Indian waters revealed that the genus *Corallianassa* is hitherto not reported from Indian waters. Therefore, the present taxon, including the genus is the first report from Indian waters.

Ghost shrimp can be the host for copepods. The cavity between the shell and body of the ghost shrimp can be a favourable site for these associated arthropods. Only a few accounts on the copepods of ghost shrimps have been described and recorded worldwide (Pillai 1959; Corsetti & Strasserm 2003; Kihara & Rocham 2013; Sepahvand et al. 2017a,b, 2019). From India Pillai (1959) had recorded and described two new species of *Clausidium* Kossmann, 1874 parasitic on

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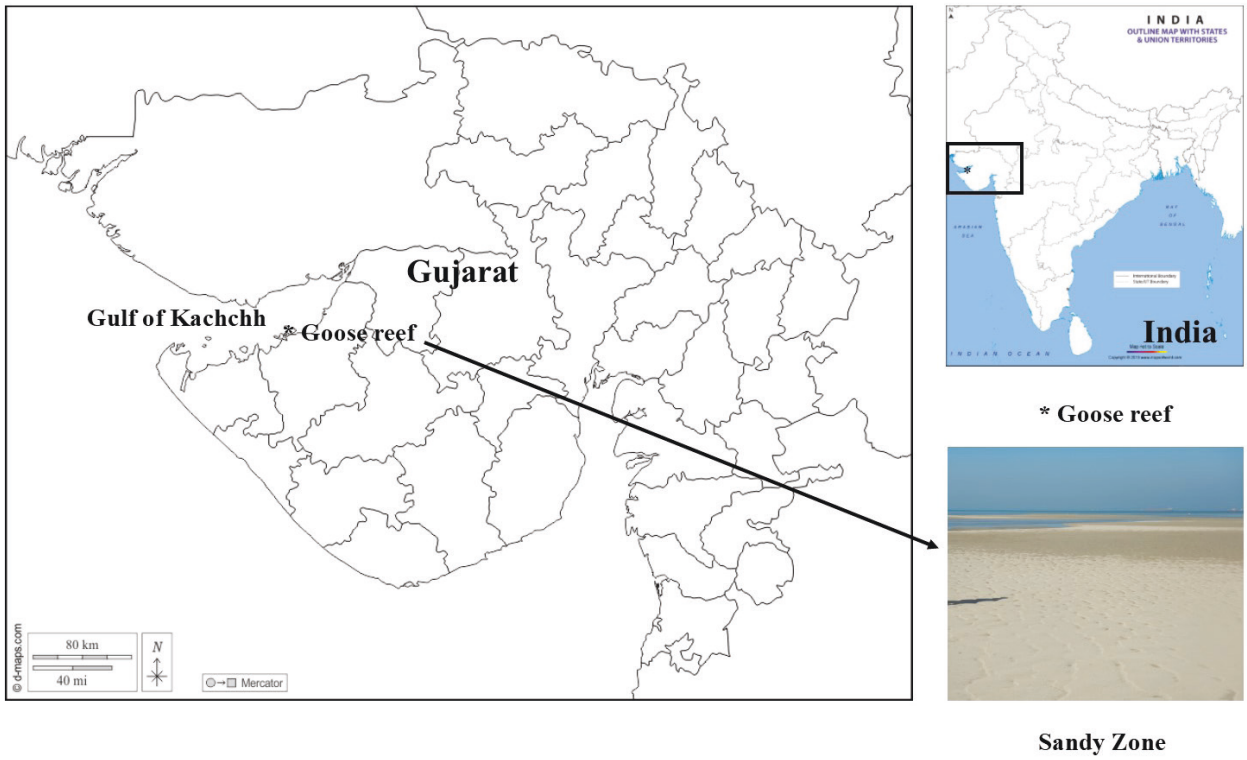


**Image 1. Study area of the new find of the ghost shrimp *Corallianassa coutierei*.**

*Callianassa* Leach, 1814 (in Leach, 1813–1815). Many researchers suggested their relationship as symbiont (Corsetti & Strasser 2003; Kihara & Rocha 2013) while many suggested them as parasites (Wilson 1935, 1937; Pearse 1947; Humes 1949; Pillai 1959). In this study, *C. coutierei* infested with copepods (*Clausidium* sp.) on the carapace region (Image 3b) can be either parasitic or symbiotic, although all the clausidiid copepods are categerised as parasitic upon different species of *Corallianassa* (Wilson 1935). Hence, this study reports *Corallianassa* genus infested with copepods for the first time from Indian waters.

## Materials and Methods

The present study was carried out at Goose reef (22.498N & 69.808E) in the Gulf of Kachchh, Gujarat (Image 1). Intertidal area of the Island is having a sandy shore, rocky shore, and coral reefs. Goose reef is under tremendous anthropogenic pressure of various industries which have constructed their offshore terminals. A single live specimen was collected, which was hidden in the sandy zone of the island. The collected specimen was transferred to the laboratory of Fisheries Research Station, Junagadh Agricultural University, Sikka. Identification was carried out through standard literature of (Man 1905; Ngoc-Ho 2005; Dworschak 2018) and communication with experts.

Size of the specimen is indicated 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 (tl) measured from the tip of the rostrum to the midpoint of the posterodorsal margin of the telson. A comprehensive checklist was compiled and prepared based on previous literatures and publications of an infraorder Axiidea from Indian waters (Table 1).

## Results

We report the ghost shrimp *C. coutierei* (Nobili, 1904) along with an associated species of copepod *Clausidium* Kossmann, 1874 for the first time in Indian waters (Image 2c,d). A comprehensive checklist of an Infraorder Axiidea listed a total of 19 species belonging to five families and 16 genera with distribution status in Indian waters is provided (Table 1). Maximum species were reported belonging to the family Callichiridae (six genera, six species) followed by Axiidae (four genera, six species), Callianassidae (four genera, five species), Callianideidae (one genus, one species), and Callianopsidae (one genus, one species).

**Systematics**

**Class:** Malacostraca Latreille, 1802
**Order:** Decapoda Latreille, 1802
**Infraorder:** Axiidea De Saint Laurent, 1979
**Family:** Callichiridae Manning & Felder, 1991
**Genus:** *Corallianassa* Manning, 1987

***Corallianassa coutierei* (Nobili, 1904)** (Image 2 & 3)

**Synonymy:**

*Callianassa* (*Callichirus*) *coutierei* Nobili, 1904
*Callianassa* (*Callichirus*) *placida* de Man, 1905
*Callianassa coutierei* (Nobili, 1904)
*Callianassa placida* de Man, 1905
*Callichirus placidus* (de Man, 1905)
*Corallichirus placidus* (de Man, 1905)
*Glypturus coutierei* (Nobili, 1904)

**Material examined**

FRSACDA1, 04.i.2018, 1 male, tl 75mm, Goose reef (22.494N & 69.802E), Intertidal zone of sandy shore, coll. Prakash Bambhaniya.

**Description**

Dorsal oval shaped as long as carapace, rostrum with acute anterolateral carapace spine (Image 2b), shorter than eyestalk. Cornea large. Third maxilliped-merus-ischium with 2.2 times as long as wide, merus shorter than ischium, ischium with crista dentata mesially, propodus as wide as long, dactylus shorter than propodus width about 0.2 of propodus. Cheliped

**Table 1. Checklist of the infraorder Axiidea of Indian waters.**

| | Infraorder | Family | Genus | Species | Author | Distribution |
|---|---|---|---|---|---|---|
| 1 | Axiidea | Axiidae | *Ambiaxius* | *Ambiaxius alcocki* (McArdle, 1900) | Radhakrishnan et al. 2012; Samuel et al. 2016 | Southwestern coast of India |
| 2 | | | *Calaxiopsis* | *Calaxiopsis felix* (Alcock & Anderson, 1899) | Alcock & Anderson 1899; Radhakrishnan et al. 2012; Samuel et al. 2016 | Indian coast |
| 3 | | | *Calocaris* | *Calocaris macandreae* Bell, 1846 | Alcock & Anderson 1894 | Laccadive Sea, India |
| 4 | | | *Eiconaxius* | *Eiconaxius andamanensis* (Alcock, 1901) | Rao 2010; Radhakrishnan et al. 2012; Samuel et al. 2016 | Andaman & Nicobar Islands |
| 5 | | | | *Eiconaxius kermadeci* Bate, 1888 | Alcock & Anderson 1894 | Laccadive Sea, India |
| 6 | | | | *Eiconaxius laccadivensis* Alcock & Anderson, 1894 | Radhakrishnan et al. 2012; Samuel et al. 2016 | Lakshadweep Islands, India |
| 7 | | Callianassidae | *Gilvossius* | *Gilvossius tyrrhenus* (Petagna, 1792) | Patel & Mahyavanshi 1974 | Okha Port, Gujarat |
| 8 | | | *Paratrypaea* | *Paratrypaea bouvieri* (Nobili, 1904) | Sakai 1999 | Gulf of Mannar |
| 9 | | | | *Paratrypaea maldivensis* (Borradaile, 1904) | Pearson 1905 | Gulf of Mannar |
| 10 | | | *Pugnatrypaea* | *Pugnatrypaea pugnatrix* (de Man, 1905) | Sakai 2005 | Tharangambadi, Tamil Nadu |
| 11 | | | *Rayllianassa* | *Rayllianassa lignicola* (Alcock & Anderson, 1899) | Alcock & Anderson 1899; Rao 2010; Radhakrishnan et al. 2012; Samuel et al. 2016 | Andaman & Nicobar Islands, Bay of Bengal |
| 12 | | Callianideidae | *Callianidea* | *Callianidea typa* H. Milne Edwards, 1837 | Rao 2010 | Andaman & Nicobar Islands |
| 13 | | Callianopsidae | *Callianopsis* | *Callianopsis caecigena* (Alcock & Anderson, 1894) | Alcock & Anderson 1894 | Bay of Bengal, India |
| 14 | | Callichiridae | *Audacallichirus* | *Audacallichirus audax* (de Man, 1911) | Rao & Kartha 1966; Sakai 1999, 2005; Dworschak 1992 | Ratnagiri, Maharashtra; eastern coast of India; Kannur, Kerala |
| 15 | | | *Balsscallichirus* | *Balsscallichirus masoomi* (Tirmizi, 1970) | Sakai 1999, 2005; Sankolli 1971 | Bombay, Maharashtra; Ratnagiri, Maharashtra |
| 16 | | | *Corallianassa* | *Corallianassa coutierei* (Nobili, 1904) | Present study | Goose reef, Gulf of Kachchh, Gujarat- India |
| 17 | | | *Karumballichirus* | *Karumballichirus karumba* (Poore & Griffin, 1979) | Sakai 1999, 2005 | Chilka Lake, Odisha; Kayamkulam Lake, Kerala; Travancore, Tamil Nadu |
| 18 | | | *Michaelcallianassa* | *Michaelcallianassa indica* K. Sakai, 2002 | Sakai 2005 | Tharangambadi, Tamil Nadu |
| 19 | | | *Neocallichirus* | *Neocallichirus jousseaumei* (Nobili, 1904) | Beleem et al. 2019 | Diu, India |

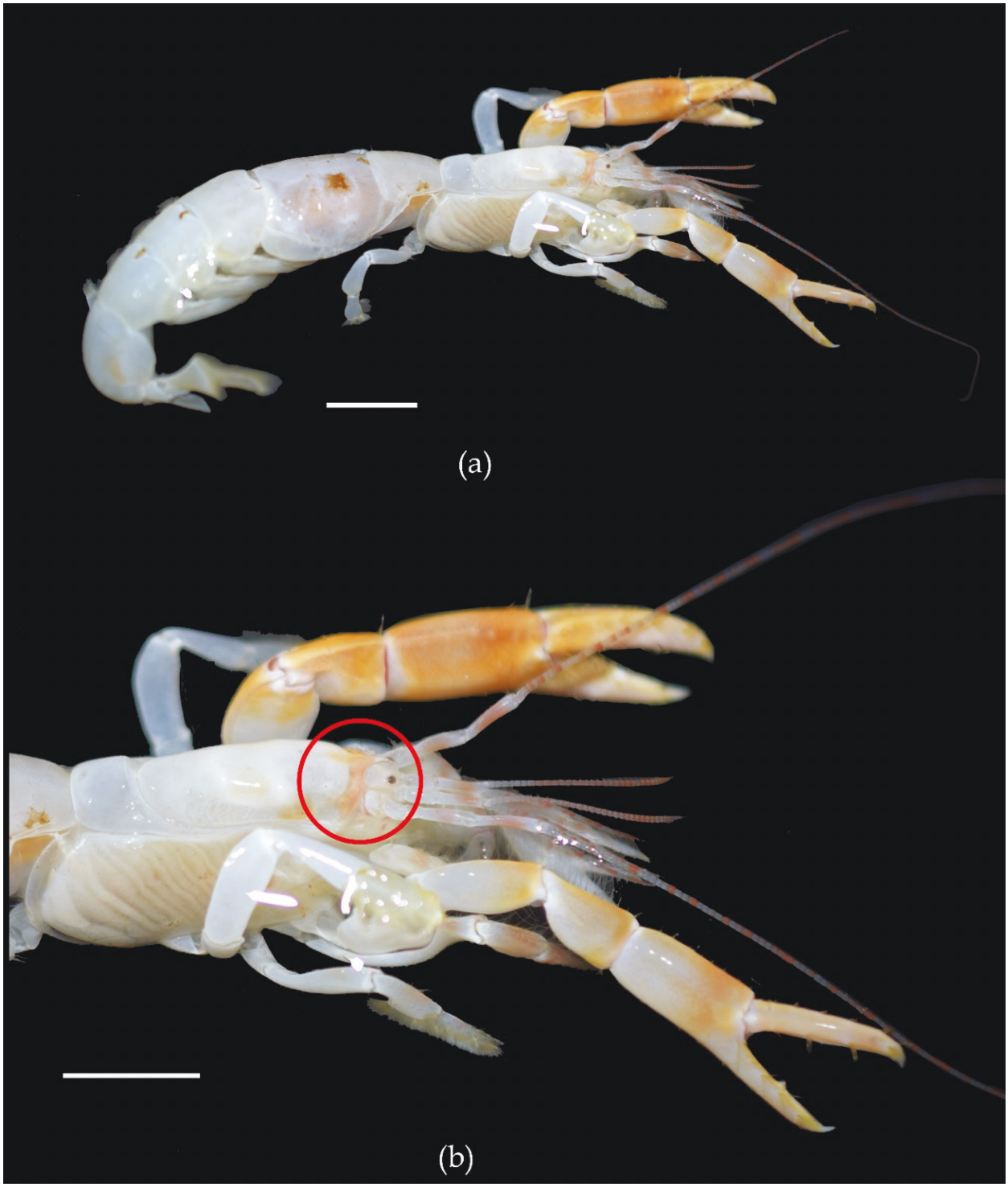


**Image 2. a—entire view of *Corallianassa coutierei* (Nobili, 1904) | b—anterolateral carapace spine of C. coutierei (Bar represents= 1cm).**


distinctly unequal in shape. Major cheliped massive, ischium unarmed anteriorly, lower margin possesses four teeth increasing gradually in size; merus having row of tubercles at lower margin; carpus broader than long; propodus smooth; cutting edge of fixed fingers sharp with small sharp triangular tooth proximally; dactylus longer than fixed finger, cutting edge sharp, unarmed. Minor cheliped relatively stout; ischium with four teeth distally increasing gradually in size, merus and carpus unarmed; propodus twice longer than carpus; cutting

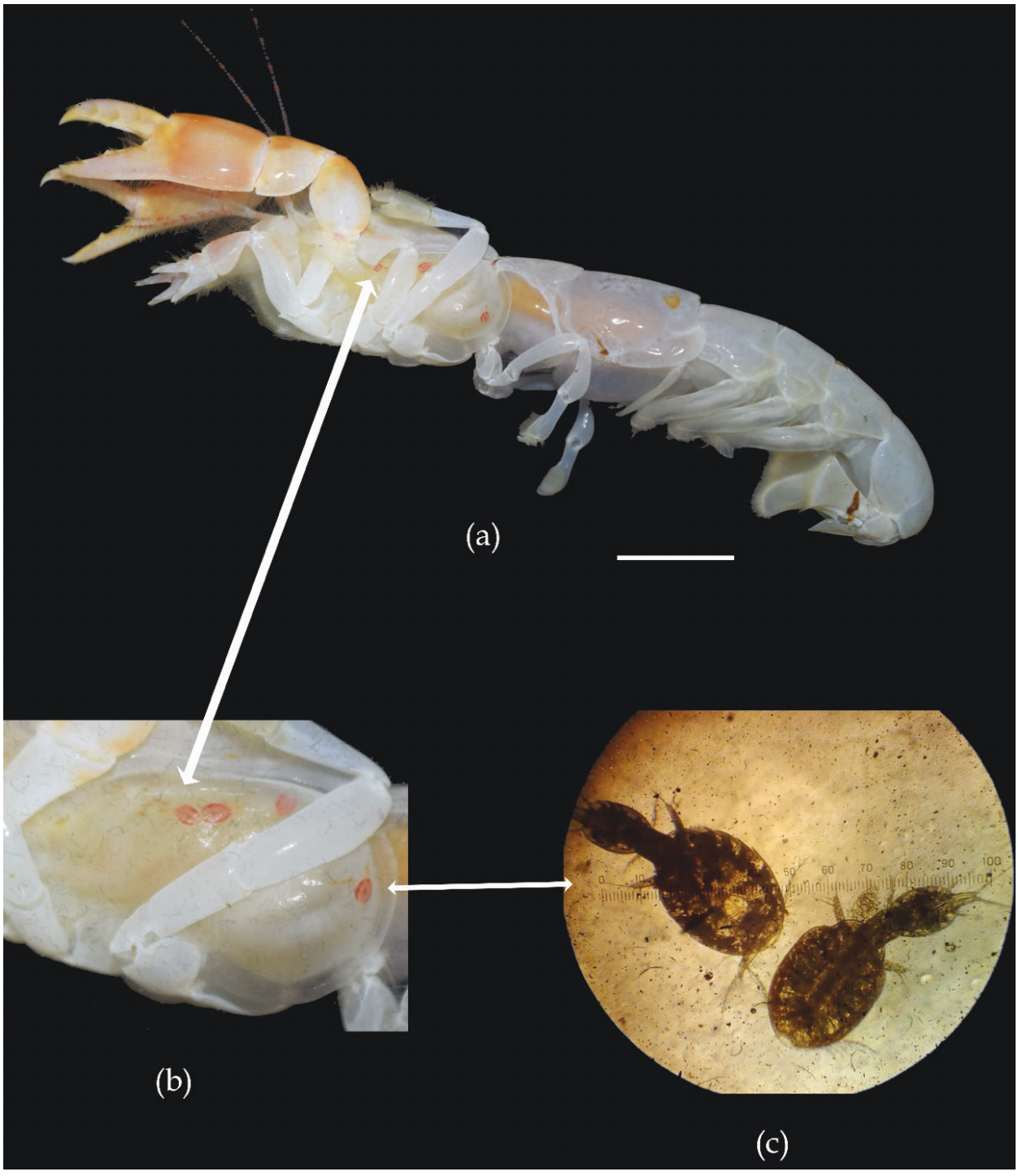


**Image 3. a—lateral view of *C. coutierei* | b—copepods (*Clausidium* sp.) infested on carapace region of *C. coutierei* | c—female-male interlocking mechanism of copepods. (Bar size= 1cm). © Fisheries Research Station, Junagadh Agricultural University, Sikka.**

edge of fixed finger with median small sharp tooth; dactylus slightly longer than fixed finger, cutting edge sharp, unarmed. Third pereopod as long as high. Telson trapezoid in shape as wide as long. Uropod, endopod oval shaped, longer than telson; uropodal exopod with strongly elevated dorsal plate, as long as endopod.

**Colour**

Entire animal whitish; carapace tinge of orange spots; chelipeds light brown with white blotches.

**Habitat**

Present species was found hidden in sandy shore of

Goose reef during low tide.

### Distribution

Arabian Gulf (Ngoc-Ho 2005); Djibouti (Sakai 1999; Dworschak 2018); Fiji (Sakai 2005); French Polynesia (Ngoc-Ho 2005); Gilbert Islands (Sakai 1999); Hawaii (Edmondson 1944); Indonesia (Man 1905; Aguilera et al. 1986; Sakai 1999); Iran (Sepahvand et al. 2013); Madagascar (Sakai 1999; Ngoc-Ho 2005); Maldives (Borradaile 1904; Man 1928); Papua New Guinea (Dworschak 2018); Philippines (Sakai 1999; Dworschak 2018); Tahiti (Sakai 1999).

India: This species is reported from Goose reef, Gulf of Kachchh, Gujarat (present study).

### Remarks

Taxonomical characters of the present specimen examined agree well with the detailed description given by Dworschak (2018). *C. coutierei* resembles *C. longiventris* (A. Milne-Edwards, 1870) but differentiated by the shape of major and minor chelipeds. Cheliped is slenderer in *C. longiventris* with triangular carpus, whereas the carpus is rectangular in *C. coutierei*. Sepahvand et al. (2017a) reported two species of copepods, *Clausidium makranensis* Sepahvand & Kihara, 2018 and *C. sarii* Sepahvand & Kihara, 2018 from *Neocallichirus natalensis* (Barnard, 1947) and *Corallianassa martensi* (Miers, 1884), respectively. This was observed in *C. coutierei* associated as *C. martensi* in this report, and it is also documented in other species *Corallianassa* (Pearse, 1947; Sephavand et al. 2017a).

## Conclusion

From India, with regards to family Callichiridae, six species are recorded, namely, *Audacallichirus audax* (de Man, 1911), *Balsscallichirus masoomi* (Tirmizi, 1970), *Karumballichirus karumba* (Poore & Griffin, 1979), *Michaelcallianassa indica* K. Sakai, 2002, *Neocallichirus jousseaumei* (Nobili, 1904), and *Corallianassa coutierei* (Nobili, 1904) (present study) (Table 1). The present investigation reports the occurrence of *C. coutierei* in association with *Clausidium* for the first time from the Indian waters. The longer duration of their relationship inclines to assume that they might be in symbiotic association. Further detailed research is required to understand the relationship of copepods (either symbiotic or parasitic). Study is also required on ghost shrimps pertaining to diversity, life history, ecology which are still lacking in India. Molecular analysis of copepods and ghost shrimps can be performed to understand their range of extension towards the Indian waters.

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