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Cover: Dorsal view of Mantis Shrimp *Cloridina ichneumon* (Fabricius, 1798) & *Gonodactylus demanii* (Henderson, 1893). © Fisheries Research Station, Junagadh Agricultural University, Sikka.



Diversity and distribution of mantis shrimps (Arthropoda: Crustacea: Stomatopoda) in the Gulf of Kachchh, Gujarat, India

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Abstract: Diversity and distribution study of Stomatopoda has been carried out in selected locations of Gulf of Kachchh from 2014 to 2020. Four species belonging to four genera in two families were recorded from Gulf of Kachchh, Gujarat. *Carinosquilla multicolorata* (White, 1848) was recorded for the first time from the west coast of India. *Cloridina ichneumon* (Fabricius, 1798) was recorded for the first time from Gujarat coast. *Gonodactylellus demanii* (Henderson, 1893) was reported after 50 years from Gulf of Kachchh, Gujarat, and *Gonodactylus smithii* Pocock, 1893 is a commonly occurring species in the intertidal zone of the Gulf of Kachchh. Species are described and illustrated with key characters and distributional status in Gulf of Kachchh. An annotated checklist of nine species of Stomatopoda occurring in Gujarat is presented.

Keywords: Annotated checklist, *Carinosquilla multicolorata*, *Cloridina ichneumon*, *Gonodactylellus demanii*, *Gonodactylus smithii*, intertidal zone, new records, west coast India.

Gujarati: કચ્છના અખાતમાં પસંદગીના સ્થળોએ વર્ષ ૨૦૧૪ થી ૨૦૨૦ દરમિયાન સ્ટોમેટોપોડાની જૈવિક વિવિધતા અને વિતરણનો અભ્યાસ હાથ ધરવામાં આવેલ. ગુજરાતના કચ્છના અખાતમાંથી બે કુળની ચાર જાતોની ચાર પ્રજાતિ નોંધવામાં આવેલ છે. *Carinosquilla multicolorata* (White, 1848) પ્રજાતિ ભારતના પશ્ચિમ કિનારેથી પ્રથમ વખત નોંધાયેલ છે, જ્યારે *Cloridina ichneumon* (Fabricius, 1798) પ્રજાતિ ગુજરાતના દરિયા કિનારેથી પ્રથમ વખત નોંધાયેલ છે. *Gonodactylellus demanii* (Henderson, 1893) પ્રજાતિ ૫૦ વર્ષ બાદ ફરીથી ગુજરાતના કચ્છના અખાતમાંથી નોંધાયેલ છે અને *Gonodactylus smithii* Pocock, 1893 કચ્છના અખાતના ભરતીઓટના વિસ્તારમાં સહજ રીતે જોવા મળતી પ્રજાતિ છે. કચ્છના અખાતમાં નોંધાયેલ પ્રજાતિઓ સચિત્ર, તેના વર્ણન, મુખ્ય લાક્ષણિકતાઓ અને વિતરણની સ્થિતિ સાથે આપવામાં આવેલ છે. ગુજરાતમાં જોવા મળતી સ્ટોમેટોપોડાની નવ પ્રજાતિઓની વિસ્તૃત યાદી સાથે આપવામાં આવેલ છે.

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INTRODUCTION

Stomatopoda Latreille, 1817 are commonly known as Mantis Shrimp, which are among the most aggressive predators with the most complex behaviour (Ahyong & Harling 2000; Ahyong 2001, 2012; van der Wal et al. 2017). They have unique raptorial appendages for hunting their prey. Prey is captured by 'spearing' or 'smashing', based on dactyl position (extended or folded) during the strike (Ahyong & Harling 2000; Ahyong 2001, 2012; Schram et al. 2013). They are cosmopolitan in distribution in tropical and subtropical coastal waters, found in a wide range of habitats including continental shelf, slope and intertidally, down to the depth of about 1,500 m; a few species are also found in cool temperate habitat of sub-Antarctic waters (Ahyong 2012; Schram et al. 2013; van der Wal et al. 2017). Worldwide, a total of 486 stomatopod species belonging to 119 genera in 17 families are known (WoRMS 2021) and more than 330 species are reported from the Indo-West Pacific region (Ahyong 2012).

Fabricius (1798) was the first to study Stomatopoda from India. Some of the notable studies on stomatopods with their distribution and biology from Indian waters include Wood-Mason (1875, 1895), Wood-Mason & Alcock (1891), Henderson (1893), Thurston (1895), Kemp (1911, 1913, 1915), Kemp & Chopra (1921), Gravely (1927), Chopra (1934), Alikunhi (1952), Chhapgar & Sane (1967, 1968), Manning (1967), Shanbhogue (1969, 1986), Dutt & Ravindranath (1975), Ghosh (1984, 1987, 1991, 1995, 1998), Rao et al. (1989), Lyla et al. (1997), Holthuis (2000), Ramakrishna et al. (2003), Venkataraman et al. (2004), Pillai & Thirumilu (2008), Kathirvel (2008) Gopalakrishnan et al. (2012), Divipala & Thirumilu (2013), Ahyong (2016), Kumaralingam & Raghunathan (2016), Sen et al. (2016), Ahyong & Kumar (2018), and Niveditha et al. (2019).

Kathirvel (2008) compiled a checklist of 66 species belonging to 23 genera in eight families of Stomatopoda in Indian waters. Most recently, Trivedi et al. (2020) compiled a comprehensive checklist of Indian stomatopods consisting of 72 species belonging to 35 genera in 10 families.

Stomatopoda of the Gujarat coast are limited to a few studies of Shanbhogue (1969, 1986), Murthy et al. (2015), Vachhrajani (2015), Zynudheen et al. (2004), and Trivedi et al. (2020). From Gujarat, seven species belonging to six genera in two families of Stomatopoda are recorded (Trivedi et al. 2020). In addition to the list, we added two more records to the Gujarat mantis shrimp fauna. Hence a total of nine species belonging

to eight genera in two families have been recorded until now (Table 1).

MATERIALS AND METHODS

The Gulf of Kachchh is situated on the west coast of India and comprises of 42 islands and reefs that provide shelter for corals, mangroves, seaweed, seagrass, and associated faunas. The intertidal area of Gulf of Kachchh is rocky, sandy, muddy and salt marshes. Seven locations were selected for the study, i.e., Kalubhar Island, Narara Reef, Dantiyo Reef, Sikka Reef, Goose Reef, Dedeka & Mundeka Island, and Pirotan Island. Four species of stomatopods were collected from the Gulf of Kachchh during the study period. The collected specimens were preserved in 95% ethyl alcohol. All specimens were deposited in the museum of the Fisheries Research Station, Junagadh Agricultural University, Sikka, Gujarat, India with accession numbers FRSACS-01 to FRSACS-04. Taxonomic identification was done using Henderson (1893), Pocock (1893), Kemp (1913), Kemp & Chopra (1921), Manning (1967), Ahyong (2001, 2016) and personal communication with experts. Comprehensive checklist of Gujarat water is prepared based on present field work and past published literatures (Table 1 & 2). Diagnostic characters, habitat, and distribution of each species is given. The size of specimens is given as the total length (TL) measured from the tip of the rostrum to the tip of the sub median spines of the telson; the carapace length (CL) excludes the rostrum. Synonymy of all species treated in this study follows that of WoRMS (2021). The present paper follows the standard classification of Ahyong (2001).

RESULTS AND DISCUSSION

Four species of Stomatopoda belonging to four genera and two families were recorded from Gulf of Kachchh, Gujarat, India. *Carinosquilla multicolorata* (White, 1848) and *Cloridina ichneumon* (Fabricius, 1798) were recorded for the first time from Gujarat coast. *Gonodactylellus demanii* (Henderson, 1893) reported 50 years ago from Gulf of Kachchh was observed again and *Gonodactylus smithii* Pocock, 1893 is a commonly occurring species in the Gulf of Kachchh. A checklist of stomatopod species of Gujarat with their occurrence sites are shown (Table 1). All the species are described and illustrated, and their world distribution summarized.

Table 1. Checklist of Stomatopoda recorded in Gujarat coast.

	Species	References (Gujarat coast)
Family: Gonodactylidae Giesbrecht, 1910		
1	<i>Gonodactylellus demanii</i> (Henderson, 1893)	Gujarat (Shanbhogue, 1986; Trivedi et al. 2020; present study)
2	<i>Gonodactylus chiragra</i> (Fabricius, 1781)	Gujarat (Shanbhogue, 1986; Trivedi et al. 2020)
3	<i>Gonodactylus smithii</i> Pocock, 1893	Gujarat (Trivedi et al. 2020; present study)
Family: Squillidae Latreille, 1802		
4	<i>Carinosquilla multicolorata</i> (White, 1848)	present study
5	<i>Clorida bombayensis</i> (Chhappgar & Sane, 1967)	Gujarat (Vachhrajani, 2015; Trivedi et al. 2020)
6	<i>Cloridina ichneumon</i> (Fabricius, 1798)	present study
7	<i>Erugosquilla hesperia</i> (Manning, 1968)	Gujarat (Trivedi et al. 2020)
8	<i>Harpiosquilla harpax</i> (de Haan, 1844)	Gujarat (Trivedi et al. 2020)
9	<i>Miyakella nepa</i> (Latreille in Latreille, Le Peletier, Serville & Guérin, 1828)	Gujarat (Zynudheen et al. 2004; Murthy et al. 2015; Vachhrajani, 2015; Trivedi et al. 2020)

Table 2. Distribution of Stomatopoda recorded in selected location of the Gulf of Kachchh.

	Species	KI	NR	DR	SR	GR	D&MI	PI
Family: Gonodactylidae Giesbrecht, 1910								
Genus: Gonodactylellus Manning, 1995								
1	<i>Gonodactylellus demanii</i> (Henderson, 1893)	-	-	-	+	+	+	-
Genus: Gonodactylus Berthold, 1827								
2	<i>Gonodactylus smithii</i> Pocock, 1893	+	+	+	+	+	+	+
Family: Squillidae Latreille, 1802								
Genus: Carinosquilla Manning, 1968								
3	<i>Carinosquilla multicolorata</i> (White, 1848)	-	-	+	+	-	-	-
Genus: Cloridina Manning, 1995								
4	<i>Cloridina ichneumon</i> (Fabricius, 1798)	-	-	+	+	+	-	+

KI—Kalubhar Island | NR—Narara Reef | DR—Dantiyo Reef | SR—Sikka Reef | GR—Goose Reef | D&MI—Dedeka & Mundeka Islands | PI—Pirotan Island.

TAXONOMY

Order: Stomatopoda Latreille, 1817

Family: Gonodactylidae Giesbrecht, 1910

Genus: Gonodactylellus Manning, 1995

Gonodactylellus demanii (Henderson, 1893) (Image 1a–f)

Gonodactylus demani Fishelson, 1971: 119, 128
[type locality: Red Sea]

Gonodactylus demanii Henderson, 1893: 455, pl. 11,
fig. 23–24 [type locality: India]

Gonodactylus hendersoni Manning, 1967: 4, fig. 1–2
[type locality: Myanmar]

Material examined: 01 Male (1) TL= 35 mm, CL= 11 mm; Obs. by Piyush Vadher (Goose Reef), FRSACS-01

Description:

Carapace smooth, slightly narrower anteriorly,

rostrum with sharp median spine; lateral margin divergent anteriorly, anterolateral angles rounded. Eyes large, cornea 1/4th length of stalk. Mandibular palp composed of three segments.

Raptorial claw folded beneath carapace; propodus dilated at distal end, deeply channeled for reception of dactylus. Dactylus inflated basally, slender distally, minutely serrated on inner margin upward to apex. Thoracic somites 6–7, lateral processes narrowed with rounded anterior and posterior margin. Thoracic somite 8 lateral process bluntly rounded. Abdominal segments 1–5 smooth, with low marginal carina; somites 1–4 rounded posterolaterally, somite 5 bluntly rectangular. Abdominal somite 6 slightly convex dorsally, dorsally with six longitudinal carinae terminating in small spine.

Telson broader than long; mid-dorsally with three longitudinal ridges, the intermediate marginal teeth



Image 1. *Gonodactylellus demanii* (Henderson, 1893), Male, TL 35 mm, Goose Reef, FRSACS-01: a—dorsal view | b—ventral view | c—telson | d—uropod | e—carapace | f—raptorial claw. © Fisheries Research Station, Junagadh Agricultural University, Sikka.

well-developed, lateral teeth small, quite distinct, two rounded tubercles at posterior end. Median and submedian with keel-shaped spinules on dorsal surface. Uropod with a short dorsal spine over first segment of exopod.

Colour: Entire body of the animal greenish with black dots scattered on some thoracic and abdominal somites. Preserved species in spirit or formalin yellowish-brown with a speckling of black chromatophores, which tend to form a transverse band in the posterior third region of the carapace.

Habitat: *Gonodactylellus demanii* is commonly found in tide pools of lower-inter tidal zone.

Distribution: Gulf of Aden, Mozambique, Pakistan, Persian Gulf, Somalia (Cappola & Manning 1995); Myanmar (Manning 1967); Red Sea (Fishelson 1971; Cappola & Manning 1995).

India: Gujarat (Shanbhogue 1969, 1986); Maharashtra (Kemp 1913; Chhappgar & Sane 1968); Tamil Nadu (Henderson 1893; Thurston 1895; Kemp 1913; Kemp & Chopra 1921; Gravely 1927; Manning 1967; Shanbhogue 1969, 1986). *Gonodactylellus demanii* (Henderson, 1893) was recorded by Shanbhogue (1969) from the Gulf of Kachchh, Gujarat, India. Presently, it is known from Sikka Reef, Goose Reef, and Dedeka & Mundeka Islands of Gulf of Kachchh (Table 2).

Remarks: *Gonodactylellus demanii* resembles *G. chiragra* (Fabricius 1781) in shape and structures but distinguished in dorsal process of ophthalmic somite minute or inconspicuous whereas conspicuous in *G. chiragra*. Telson of both the species has swollen ridges but median of *G. demanii* has more strongly convex than *G. chiragra*. Telson ridges ending with spines possess "V" shaped furrow in *G. demanii* whereas "V" shaped furrow absent in *G. chiragra* (Kemp 1913). This species is rare in the Gulf of Kachchh. *G. osheai* Ah Yong, 2012 is identical to *G. demanii* in having a small cluster of setae on inner proximal margin of uropod endopod but *G. osheai* differentiated in having its anterior margin of the rostral plate sloping posteriorly, the anterolateral corners of the rostral plate distinctly rounded whereas *G. demanii* anterior margins of the rostral plate are concave and the anterolateral corners are angular to sharp (Ahyong 2012). In addition to dissimilarity, intermediate teeth of the telson distinctly longer than half the length of the submedian teeth in *G. osheai* whereas, the intermediate teeth of the telson are shorter than half the length of the submedian teeth in *G. demanii* (Ahyong 2012). This species is rare in Gulf of Kachchh.

Genus: *Gonodactylus* Berthold, 1827

Gonodactylus smithii Pocock, 1893

(Image 2a–f)

Gonodactylus smithii Pocock, 1893: 475, pl. 20B [type locality: Arafura Sea]

Gonodactylus arabica Ghosh, 1991: 201, 205, fig. 2 [type locality: India]

Gonodactylus chiragra var. *anancyrus* Borradaile, 1900: 395, 397, 401 [type locality: New Caledonia, Papua New Guinea]

Gonodactylus chiragra var. *intermedia* de Man, 1929: 2, 25, pl. 3, fig. 9 [type locality: Myanmar]

Gonodactylus minikoensis Ghosh, 1991: 201, 202, fig. 1 [type locality: India]

Material examined: 02 Male (1) TL= 70 mm, CL= 19 mm; (2) TL= 65 mm, CL= 14 mm; Obs. by Piyush Vadher (Goose Reef); 01 Female (1) TL= 64 mm, CL= 15 mm; Obs. by Hitesh Kardani (Sikka Reef), FRSACS-02.

Description

Carapace smooth, slightly narrower in front, rostrum slightly broader than long, rostral plate's margin concave anteriorly, apical spine on rostrum longer than base; lateral margin divergent anteriorly, anterolateral angles convex or rounded.

Ocular scales broad, flattened. Eyes large, cornea 1/4th longer than stalk. The mandibular palp present; composed of three segments. Raptorial claw folded underside of the carapace; propodus dilated at distal end. Dactylus inflated basally, slender dactylus possess rows of microscopic spinules on its inner margin upward to the apex.

Thoracic somites 6–7 lateral processes narrowed with rounded anterior and posterior margin. Thoracic somite 8 possesses blunt rounded lobe. Abdominal segments 1–5 smooth. Abdominal segment 6 with sharp carinae, posteriorly ending with six sharp acute spines.

Telson anchor shaped, broader than long with distinct median carina, sub median and lateral carina. Intermediate and sub-mediate denticles with minute sharp movable spine. Outer margin of uropod exopod distal segment with 10–13 uneven movable spines.

Habitat: *Gonodactylus smithii* Pocock, 1893 is commonly found under the crevices of dead corals.

Colour: Entire body deep green with light green patches; propodus of the raptorial limb reddish purple at the anterior end; dactylus light purple.

Distribution: Arafura Sea (Pocock 1893); Myanmar (Man 1929); New Caledonia (Borradaile 1900; Ahyong 2001); Papua New Guinea (Borradaile 1900); Western Indian Ocean to Vietnam (Ahyong 2001).



Image 2. *Gonodactylus smithii* Pocock, 1893, Male, TL 70 mm, Goose Reef, FRSACS-02: a—dorsal view | b—ventral view | c—telson | d—uropod | e—carapace | f—raptorial claw. © Fisheries Research Station, Junagadh Agricultural University, Sikka.

India: Gujarat (Trivedi et al. 2020); Lakshadweep Islands (Shanbhogue 1969, 1986; Rao et al. 1989; Ghosh 1991; Venkataraman et al. 2004; Sen et al. 2016); Andaman & Nicobar Islands (Niveditha et al. 2019). The species was found in all locations sampled in the Gulf of Kachchh (Table 2). *Gonodactylus smithii* Pocock, 1893 has cosmopolitan distribution in Gulf of Kachchh.

Remarks: This species resembles *Gonodactylus chiragra* (Fabricius, 1781) and *Gonodactylus platysoma* Wood–Mason, 1895 in shape and structure but are immediately distinguished by the acute anterolateral angles of rostrum, generally more slender median carinae of telson and merus of claw with crimson coloured blotch on inner margin (Ghosh 1991). This species is common throughout Gulf of Kachchh.

Family: Squillidae Latreille, 1802

Genus: *Carinosquilla* Manning, 1968

Carinosquilla multicolorata (White, 1848)

(Image 3a–f)

Squilla multicolorata White, 1849: 144, pl. 6, fig. 1 [type locality: Philippines]

Material examined: 01 Male (1) TL= 73 mm, CL= 17 mm; Obs. by Hitesh Kardani (Sikka Reef), FRSACS-03

Description

Rostral plate as long as broad; carapace with longitudinal rows of sharp carina. Eye stalk lack carinae. Ocular scales without bifurcation, whole. Medial carina distinct, anteriorly bifurcated, opening posterior to dorsal pit. Raptorial claw oblong, merus outer region with longitudinal row of carina, carpus dorsal margin with rows of small teeth; dactylus with five uneven sharp teeth. Mandibular palp present. Maxilliped 1–4 with epipod. TS5 dorsal carinae transverse, except medially. TS6–8 and AS1–6 dorsal carinae subparallel, most or all posteriorly armed above intermediate carinae.

Thoracic somite 5 lateral process possesses a slender spine anterolaterally on anterior lobe; posterior lobe small, broad, rounded laterally. Thoracic somite 6 lateral process anterior lobe quadrate shaped, rounded apex, posterior lobe broad rounded. Thoracic somite 7 lateral process anterior lobe short, blunt; posterior lobe larger than anterior lobe, broad, rounded. Thoracic somite 8 triangular anterolateral margin, apex acute; sternal keel triangular. All abdominal somites with equals carinae spines; submedian 1–6; intermediate 1–6, lateral 1–6, marginal 1–5. Telson as long as broad; prelateral lobe with sharp tooth at the apex longer than margin of lateral tooth, dorsal surface with numerous longitudinal carinae structure, denticles submedian 3, intermediate

8–9, lateral 1. Uropodal protopod inner margin possess eight slender spines, endopods articulated with ventral tuberculation process. Uropodal exopodal segments possess nine movable spines on outer margin. Endopods carinate distally.

Habitat: *Carinosquilla multicolorata* (White, 1848) is found in the crevices of rocks in the Gulf of Kachchh.

Distribution: Japan to Vietnam, Malaysia, northeastern Indian Ocean, Singapore, Thailand (Ahyong 2016); Philippines (White 1849; Ahyong 2016).

India: Tamil Nadu (Kemp 1913; Shanbhogue 1969, 1986; Lyla et al. 1997; Gopalakrishnan et al. 2012; Divipala & Thirumilu 2013; Ahyong & Kumar 2018); West Bengal (Ghosh 1995, 1998). *C. multicolorata* (White, 1848) reported for the first time from the west coast of India. It is here reported from Dantiyo Reef and Sikka Reef of Gulf of Kachchh (Table 2).

Remarks: Descriptive characters of the present specimen agree well with the detailed descriptions of Kemp (1913), Ahyong & Moosa (2004), and Ahyong et al. (2008). *C. multicolorata* resembles *Carinosquilla carita* Ahyong, 2001 but immediately distinguished in a presence of a mandibular pulp whereas absent in *C. carita* and *C. carita* possess more slender anterior lobe on thoracic somite 6 and a blunt spiniform apex on the prelateral lobe where as a sharp in *C. multicolorata* (Ahyong 2001).

Genus: *Cloridina* Manning, 1995

Cloridina ichneumon (Fabricius, 1798)

(Image 4a–f)

Squilla ichneumon Fabricius, 1798: 416 [type locality: India]

Squilla microphthalma H.M. Edwards, 1837: 523 [type locality: India]

Material examined: 01 Male (1) TL= 53 mm, CL= 15 mm; Obs. by Piyush Vadher (Sikka Reef), FRSACS-04

Description

Dorsal surface of the carapace and abdomen smooth, carapace lacks median or lateral carinae. Rostrum triangular, as long as wide, rounded apically. Cornea wider two times in the total length of eye. Eyes pear shaped, as long as 2/3rd which reaches to the basal segment of antennular peduncle. Medial and submedian carina absent on first five abdominal segments. Raptorial claw oblong, merus unarmed, carpus dorsal margin with rows of small teeth; dactylus with five uneven, evenly spaced sharp teeth. Mandibular palp present.

Thoracic somite 5 lateral process possesses a sharp spine. Thoracic somites 6–8 lateral processes smooth

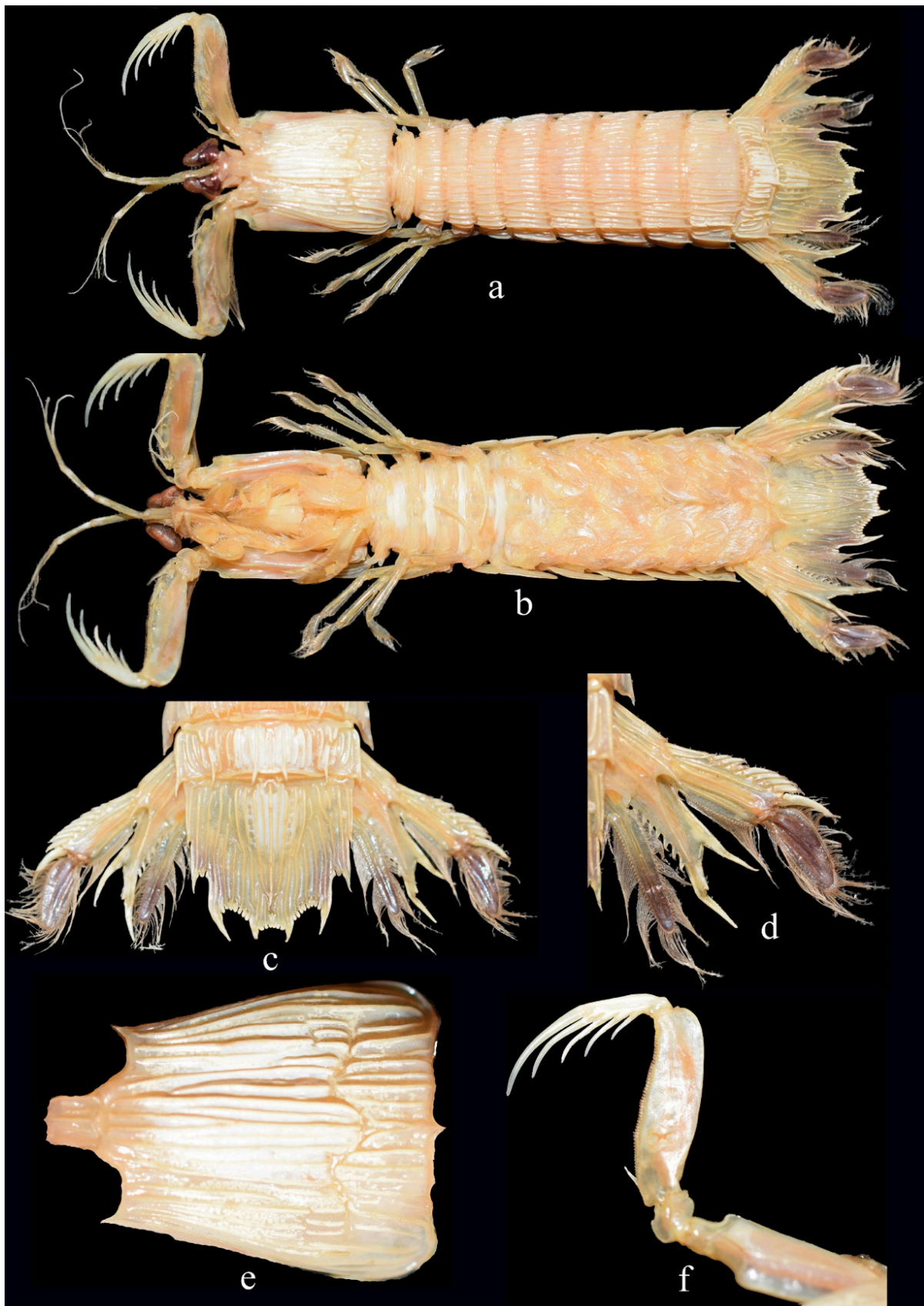


Image 3. *Carinosquilla multicolorata* (White, 1848), Male, TL 73 mm, Sikka Reef, FRSACS-03: a—dorsal view | b—ventral view | c—telson | d—uropod | e—carapace | f—raptorial claw. © Fisheries Research Station, Junagadh Agricultural University, Sikka.

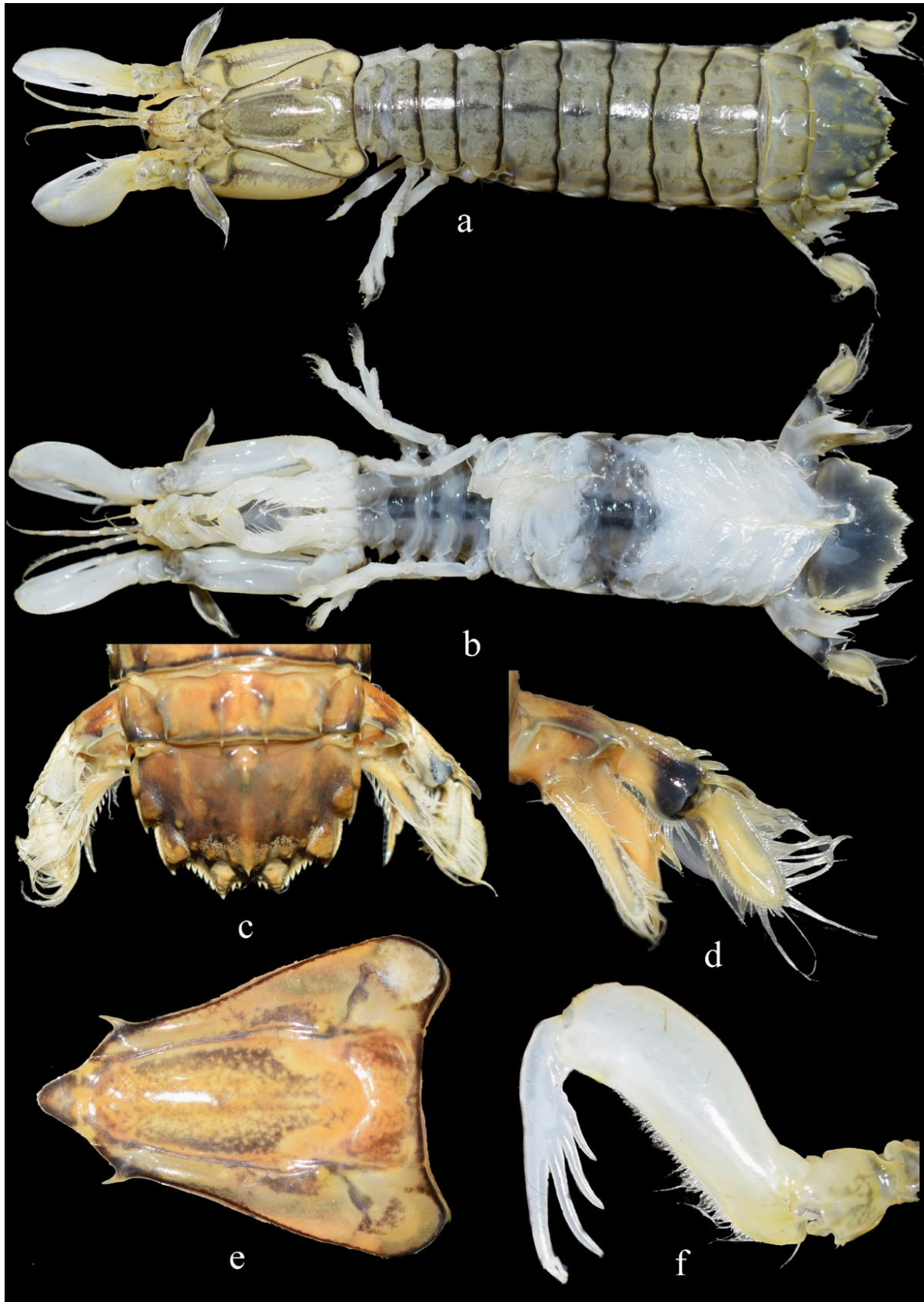


Image 4. *Cloridina ichneumon* (Fabricius, 1798), Male, TL 53 mm, Sikka Reef, FRSACS-04: a—dorsal view | b—ventral view | c—telson | d—uropod | e—carapace | f—raptorial claw. © Fisheries Research Station, Junagadh Agricultural University, Sikka.

convex lobed. Abdominal somites 1–6 smooth, unarmed. Telson as long as wide, median carinae distinct, dorsal surface with uneven small tooth, marginal carina with distinct sharp teeth at posterior margin, lateral and submedian carinae possess minute sharp teeth at distal margin. Uropod comprises a row of seven small spines on inner margin.

Habitat: *Cloridina ichneumon* (Fabricius, 1798) commonly found in sandy zone of lower intertidal zone.

Colour: Specimens observed after about 2-month preservation in formalin show general body colour pale white: posterior margins of carapace, exposed thoracic and first five abdominal somites bear black colour, in male these bands are more prominent, characteristic patch of black colour present on distal part of proximal segment of uropodal exopod.

Distribution: Eastern Africa, Gulf of Thailand, Singapore, South China Sea (Ahyong 2016).

India: Maharashtra (Kemp 1913; Chhapgar & Sane 1968; Shanbhogue 1986; Holthuis 2000; Ahyong 2016); Tamil Nadu (Kemp 1913; Kemp & Chopra 1921; Shanbhogue 1986). *C. ichneumon* (Fabricius, 1798) reported first time from Gujarat coast. It is here reported from Dantiyo Reef, Sikka Reef, Goose Reef, and Pirotan Island of Gulf of Kachchh (Table 2).

Remarks: Descriptive characters and diagnosis of the present specimen well agreed with the detailed descriptions by Kemp (1913), Kemp & Chopra (1921), and Shanbhogue (1986).

C. ichneumon resembles *Cloridina stephensoni* Ahyong, 2001 but distinguished in having as long as or longer than broad rostral plate and the apices of the dorsal processes formed to acute spines whereas in *C. stephensoni* possess shorter rostral plate, unarmed apices of dorsal processes of the antennular somite (Ahyong 2001).

CONCLUSION

In the Gulf of Kachchh, Mantis Shrimp possess high diversity in Goose Reef and Sikka Reef compared to the other reef of the Gulf of Kachchh (Table 2). They are mostly found in the crevices of rocks, under dead corals and inside the holes of water pools. *Gonodactylus demanii* (Henderson, 1893), *Carinosquilla multicaudata* (White, 1848), and *Cloridina ichneumon* (Fabricius, 1798) are rare and sparsely distributed in the lower intertidal zone of the Gulf of Kachchh whereas *Gonodactylus smithii* Pocock, 1893 is very common in the intertidal zone. *G. smithii* Pocock, 1893 is found in the crevices

of pools exposed at low tide. The reproductive season for mantis shrimp in the region seems to be during the monsoon given the abundance of larvae seen during the monsoon in the field. Juveniles were found in winter season.

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