

## AN ACCOUNT OF NEW RECORDS OF REEF ASSOCIATED CRABS OF ANDAMAN AND NICOBAR ISLANDS

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### INTRODUCTION

The Andaman and Nicobar Islands is located in Bay of Bengal with an area of 8269 km<sup>2</sup>. Andaman and Nicobar Islands comprised of 572 islands spread in a linear distance of nearly 800 kms. These undulating islands are covered with dense forests and an endless variety of exotic flora and fauna between Burma and Indonesia. Andaman and Nicobar Islands are recently recognized as a world-class eco-tourist destination to discover the underwater treasures of marine life. Malacostraca includes most of the large and familiar crustaceans such as crabs, shrimps, lobsters, crayfish, isopods, amphipods and others. Primitively the trunk of malacostraca consists of 15 segments, eight in the thorax and seven in the abdomen but in most recent species the abdomen has only six segments. Decapoda, the largest and most familiar crustaceans with 10,000 species of crabs, shrimps, crayfishes, lobsters, and their relatives. Like the shrimps and lobsters, crabs belong to the order Decapoda (= "ten-legged", referring to the 10 thoracic appendages normally present in these crustaceans). Crabs can be classified into 2 main groups, brachyuran crabs (infraorder Brachyura) and anomuran crabs (infraorder Anomura). Most species of Brachyura, or true crabs, can easily be separated from the so-called "false crabs" belonging to the infraorder Anomura by having 4 pairs of well-developed walking legs. Brachyuran crabs are bioenergetically vital faunal component

of the mangrove ecosystem while decapod crustaceans are dominant in coral habitat.

### REVIEW OF LITERATURE

The true crabs have been studied in India by various workers (Alcock 1899a, 1899b, 1901; Borradaile 1903; Gravely 1927; Chopra 1930 1931; Premkumar 1971; Deb 1985a; Jameson *et al.* 1982; Sethuramalingam and Ajmalkhan 1991; Deb 1992; Jayabaskaran and Venkataraman 1999; Kumaralingam *et al.* (2009). Jayabaskaran *et al.* (2000) studied the brachyuran crabs of Gulf of Mannar region and reported 105 species and Venkataraman *et al.* (2004) provided the baseline information of crabs of India. Very less information is available on distribution of brachyuran crabs from Andaman and Nicobar Islands [Sankarankutty (1961, 1962a, 1962b); Reddy and Ramakrishna (1972); Pretzmann (1984) and Deb (1985a,b)]. Dev Roy and Das (2000) reported 51 species of crabs in mangrove environment of Andaman Islands, of which 19 were coral associates. Kariathil *et al.* (2002) recorded 20 reef associated crab species from Great Nicobar Island. Dev Roy and Nandi (2005) studied the brachyuran diversity of coral reef ecosystem in India. Soundarapandian *et al.* (2008) examined the biodiversity of crabs in Pichavaram mangrove environment of south east coast of India. Kumaralingam *et al.* (2012) studied the diversity and distribution of brachyuran crabs from Ritchie's Archipelago.

### SURVEY

A total of 21 areas were surveyed during 2012 to 2013 (Fig. 1). Collection of crabs was made by most often hand picking in intertidal and subtidal

zones. All collected specimens were identified and confirmed upto species level by standard monographs (Chhapgar, 1957; Sakai, 1976; Serene, 1984; Osawa and Chan, 2010; Poupin and Juncker, 2010).

Sl. No.	Area Surveyed	Coordinates
	<b>North Andaman</b>	
	Diglipur	
1	Trilby Island	Lat, 13°24.577'N & Long 093°04.252'E
2	Peacock Island	Lat, 13°33.692'N & Long 093°03.119'E
4	Diglipur	Lat 13°16.595'N & Long 093°01.202'E
	<b>North-Middle Andaman</b>	
	Mayabunder	
4	Curlew Island	Lat 12°56.092' N & Long 092°53.168'E
5	Sound Island	Lat 12°55.340' N & Long 092°58.422'E
6	Rampur	Lat 12°53.244' N & Long 092°54.273'E
	<b>South Andaman</b>	
	Ritchie's Archipelago	
6	Neil Island station -I	Lat 11°50.230'N & Long 093°01.978' E
7	Neil Island station-II	Lat 11°50.309'N & Long 093°01.806' E
8	Rifleman Island	Lat 11°30.893'N & Long 092°38.746'E
9	Burmanallah station-II	Lat 11°33.787'N & Long 092°44.051'E
10	Burmanallah station-III	Lat 11°34.383'N & Long 092°44.406'E
11	Burmanallah station-I	Lat 11°34.247'N & Long 092°44.244'E
12	Burmanallah station-IV	Lat 11° 33.876'N & Long 092°44.023'E
13	North Bay	Lat 11°42.116'N & Long 092°45.169'E
	Little Andaman Island	
14	Harminder bay	Lat 10° 33.006'N & Long 092° 32.710'E
15	Kalapathar	Lat 10° 39.292'N & Long 092° 34.769'E
16	Pathar Nallah	Lat 10° 53.226'N & Long 092° 32.060'E
	Great Nicobar Island	
17	Shastri Nagar station-I	Lat 06°47.856'N & Long 093°53.177'E
18	Shastri Nagar station-II	Lat 06°47.832'N & Long 093°53.123'E

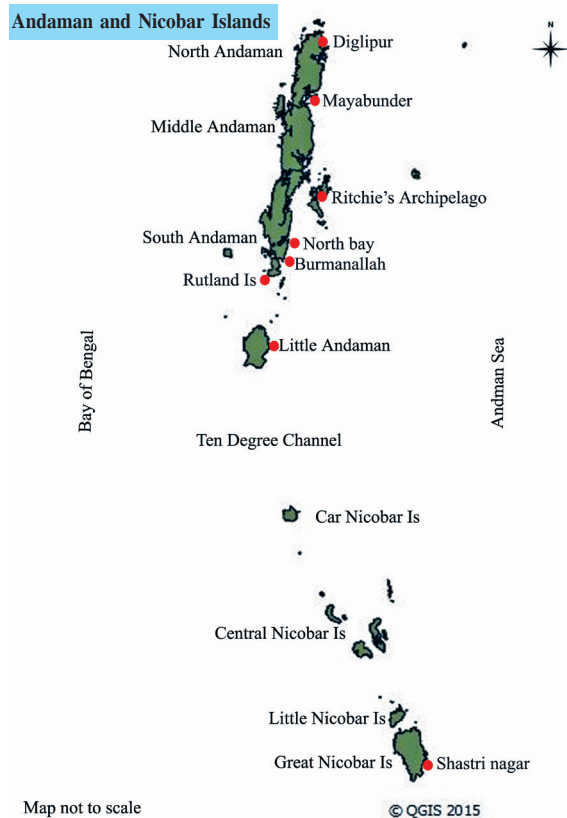


Fig. 1. Map showing the area surveyed

### SYSTEMATIC LIST OF NEWLY RECORDED CRABS FROM ANDAMAN AND NICOBAR ISLANDS

The present paper describes the newly recorded 26 species of brachyuran crabs from Andaman and Nicobar Islands.

Kingdom ANIMALIA Linnaeus, 1758

Phylum ARTHROPODA von Siebold, 1848

Sub Class CRUSTACEA Pennant, 1777

Class MALACOSTRACA Latreille, 1806

Order DECAPODA Latreille, 1803

Family DROMIIDAE de Haan, 1833

Genus *Cryptodromia* Stimpson, 1858

1. *Cryptodromia mariae* Ihle, 1913

Family EPIALTIIDAE MacLeay, 1838

Genus *Xenocarcinus* White, 1847

2. *Xenocarcinus depressus* Miers, 1874

Family GRAPSIDAE MacLeay, 1838

Genus *Metopograpsus* H. Milne Edwards, 1853

3. *Metopograpsus quadridentatus* Stimpson, 1858

Genus *Thalassograpsus* Tweedie, 1950

4. *Thalassograpsus harpax* (Hilgendorf, 1892)

Subfamily VARUNINAE H. Milne Edwards, 1853

Genus *Hemigrapsus* Dana, 1851

5. *Hemigrapsus penicillatus* (de Haan, 1835)

Genus *Gaetice* Gistel, 1848

6. *Gaetice unguulatus* Sakai, 1939

Family INACHIDAE MacLeay, 1838

Genus *Camposica* Latreille, 1829

7. *Camposica retusa* Latreille, 1829

Family MACROPHTHALMIDAE Dana, 1851

Genus *Macrophthalmus* Latreille, 1829

Sub genus *Chaenostoma* Stimpson, 1858

8. *Macrophthalmus (Chaenostoma) lisae* Poupin & Bouchard, 2010

Family PILUMNIDAE Samouelle, 1819

Genus *Ceratoplax* Stimpson, 1858

9. *Ceratoplax ciliata* Stimpson, 1858

Family PORTUNIDAE Rafinesque, 1815

Genus *Lissocarcinus* Adams and White, 1848

10. *Lissocarcinus laevis* Miers, 1886

Genus *Thalamita* Latreille, 1829

11. *Thalamita spinimana* Dana, 1852

Family SESARMIDAE Dana, 1852

Genus *Episesarma* de Man, 1895

12. *Episesarma chengtongense* (Serene & Soh, 1967)

13. *Episesarma palawanense* (Rathbun, 1914)

Family XANTHIDAE MacLeay, 1838

Genus *Atergatis* de Haan, 1833

14. *Atergatis ocyroe* (Herbst, 1801)

15. *Atergatis reticulatus* de Haan, 1833

Genus *Xanthias* Rathbun, 1897

16. *Xanthias latifrons* (de Man, 1887)

Genus *Macromedaeus* Ward, 1942

17. *Macromedaeus orientalis* (Takeda & Miyake, 1969)

Genus *Nanocassiope* Guinot, 1967

18. *Nanocassiope alcocki* (Rathbun, 1902)

Genus *Leptodius* A. Milne Edwards, 1863

19. *Leptodius davaoensis* Ward, 1941

Subfamily LIOMERINAE Sakai, 1976

Genus *Liomera* Dana, 1851

20. *Liomera pallida* (Borradaile, 1900)

Infraorder ANOMURA MacLeay, 1838

Family PORCELLANIDAE Haworth, 1825

Genus *Lissoporcellana* Haig, 1978

21. *Lissoporcellana spinuligera* (Dana, 1853)

Genus *Petrolisthes* Stimpson, 1858

22. *Petrolisthes asiaticus* (Leach, 1820)

23. *Petrolisthes pubescens* Stimpson, 1858

24. *Petrolisthes hastatus* Stimpson, 1858

25. *Petrolisthes fimbriatus* Borradaile, 1898

Superfamily GALATHEOIDEA  
Samouelle, 1819

Family Galatheidae Samouelle, 1819

Genus *Allogalatea* Baba, 1969

26. *Allogalatea elegans* (Adams & White, 1848)

### SYSTEMATIC ACCOUNT

Kingdom ANIMALIA Linnaeus, 1758

Phylum ARTHROPODA von Siebold, 1848

Sub Class CRUSTACEA Pennant, 1777

Class MALACOSTRACA Latreille, 1806

Order DECAPODA Latreille, 1803

Family DROMIIDAE de Haan, 1833

Genus *Cryptodromia* Stimpson, 1858

1. *Cryptodromia mariae* Ihle, 1913 (Fig. 2)



Fig. 2. *Cryptodromia mariae* Ihle, 1913

1913. *Cryptodromia mariae* Ihle, Siboga Expeditie Monografie, 39(b), P. 96.

1950. *Cryptodromia maria* Buitendijk, *Bulletin of the Raffles Museum*, Vol. 21, P. 59-82.

1983a. *Cryptodromia maria* Sakai, *Researches on Crustacea*, Vol. 12, P. 1-44.

2001. *Cryptodromia maria* McLay, *Zoosystema*, Vol. 23(4), P. 807-856.

*Material Observed:* 1 ex, Locality: Riflemen Island, South Andaman, Name of collector: S.Kumaralingam, Coll. Dt: 06.02.2013, Depth: 5 to 10 meters.

### DIAGNOSTIC CHARACTERS

Carapace approximately as wide as long, three antero-lateral teeth, lateralrostral teeth triangular, first two pairs of legs very nodular.

*Distribution:* India (Riflemen Island, Rutland, South Andaman) *Elsewhere:* Japan and west of New Guinea.

Family EPIALTIDAE MacLeay, 1838

Genus *Xenocarcinus* White, 1847

2. *Xenocarcinus depressus* Miers, 1874  
(Fig. 3)

1872. *Xenocarcinus tuberculatus* Milne Edwards, Vol. 8, P. 229-267.

1874. *Xenocarcinus depressus* Miers, Vol. 2, P. 1-5.

1906. *Xenocarcinus depressus* Laurie, Vol. 40, P. 349-432.

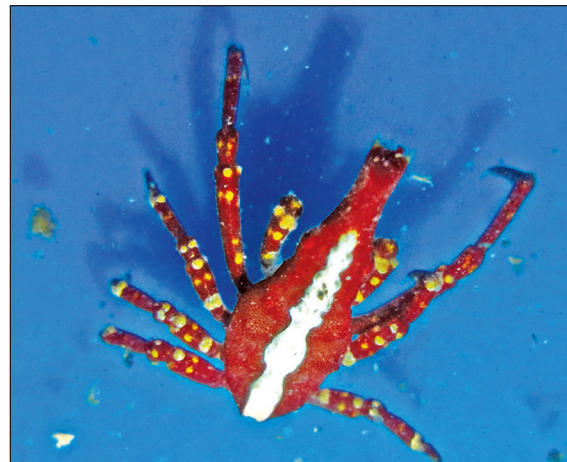


Fig. 3. *Xenocarcinus depressus* Miers, 1874

*Material observed:* 1ex, Locality: Trilby Island, Diglipur, North Andaman, Name of collector: S.Kumaralingam, Coll. Dt: 18.08.2014, Depth: 8 to 10 meters.

### DIAGNOSTIC CHARACTERS

Carapace elongate-ovate, gastric region convex, cardiac slightly concave, surfaces with unequal rounded tubercles, in the cardiac-intestinal region a plum blossom-shaped one. Eye stalks short and stout. First pleopod of the male with a styliform chitinous process with long hairs distally. Abdomen of female ovate (Dai & Yang, 1991).

*Distribution:* India (Diglipur, North Andaman)  
*Elsewhere:* Japan, China, Australia and Fiji.

Family GRAPSIDAE MacLeay, 1838

Genus *Metopograpsus* H. Milne Edwards, 1853

3. *Metopograpsus quadridentatus*

Stimpson, 1858 (Fig. 4)

1858b. *Metopograpsus quadridentatus* Stimpson, *Proceedings of the Academy of Natural Sciences of Philadelphia*, Vol. 10, P. 93-110.

1907. *Metopograpsus quadridentatus* Stimpson, Vol. 49 (1717), P. 1-240.

1936. *Pachygrapsus quadrates* Tweedie, *Bulletin of the Raffles Museum*, Singapore, Vol. 12, P. 44-70.



Fig. 4. *Metopograpsus quadridentatus*  
Stimpson, 1858

*Material observed:* 1ex, Locality: Burmanallah station-II, South Andaman, Name of collector: S. Kumaralingam, Coll. Dt: 24.01.2013, Depth: 1 to 2 meters.

**DIAGNOSTIC CHARACTERS**

Lateral margin of the carapace with a tooth behind the external orbital angle. Cervical groove shallow. Two distinct parallel transverse ridges on the hepatic region of the carapace before the cervical groove. The propodi of the first three ambulatory legs without a row of fine hairs on the posterior surface.

*Distribution:* India (Burmanallah, South Andaman). *Elsewhere:* Singapore, China and Java Island of Indonesia.

Genus *Thalassograpsus* Tweedie, 1950

4. *Thalassograpsus harpax* (Hilgendorf, 1892)  
(Fig. 5)

1892. *Thalassograpsus harpax* Hilgendorf, Vol. 4, P. 37-40.

1911. *Thalassograpsus harpax* Pesta, Vol. 88, P. 36-65.

1918a. *Thalassograpsus harpax* Tesch, *Siboga Expeditie Monografie*, Vol. 82, P. 1-148.

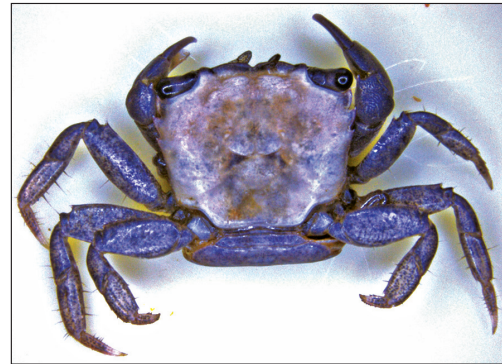


Fig. 5. *Thalassograpsus harpax* (Hilgendorf, 1892)

*Material examined:* 1 ex female, Reg. No: ZSI/ANRC-8335, Locality: Burmanallah station-III, South Andaman, Name of collector: S. Kumaralingam, Coll. Dt: 24.01.2013, Depth: 1 to 2 meters.

**DIAGNOSTIC CHARACTERS**

The surface of carapace near carinae and ridges is imperfectly covered with minute pits or wrinkles. Antero-lateral borders are cut into three sharp teeth, of which the external orbital one is largest and the third one is smallest; The chela of male is very high and swollen on outer surface, the inner surface is covered thickly with soft hairs; the movable finger is slender and much curved, a prominent tooth occurs near its middle point and a few denticles near the distal end; the tips of these segments are only slightly hollowed (Sakai, 1939).

*Distribution:* India (Burmanallah, South Andaman). *Elsewhere:* Japan, Taiwan and Samoa.

Subfamily VARUNINAE H. Milne  
Edwards, 1853

Genus *Hemigrapsus* Dana, 1851

5. *Hemigrapsus penicillatus* (de Haan, 1835)  
(Fig. 6)



Fig. 6. *Hemigrapsus penicillatus* (de Haan, 1835)

- 1833-1849. *Grapsus (Eriocheir) penicillatus* de Haan, P. 1-243.
1879. *Hemigrapsus penicillatus* de Man, Notes from the Leyden Museum, Vol. 1 (19), P. 53-73.
1928. *Brachynotus brevidigitatus* Yokoya, *Science Reports of the Tôhoku Imp. Univ. Sendai*, Vol. 3(4), P. 757-784.

*Material observed:* 2 ex Male, Locality: Harminder Bay, Little Andaman Island, Name of collector: S. Kumaralingam, Coll. Dt: 13.02.2012, Depth: 2 to 3 meters.

### DIAGNOSTIC CHARACTERS

The carapace of this species is more convex than in *Hemigrapsus sanguineus*, more markedly depressed on hepatic and postero-lateral borders. The three antero-lateral teeth are broad and the postero-lateral facet well defined. The chela of male has a patch of soft hairs on inner and outer surfaces near the base of the fingers; in female and juvenile male, the chela is devoid of hairs (Sakai, 1939).

*Distribution:* India (Harminder bay, South Andaman). *Elsewhere:* Japan, Korea and Hawaiian Islands.

Genus *Gaetice* Gistel, 1848

#### 6. *Gaetice ungulatus* Sakai, 1939 (Fig. 7)

1939. *Gaetice ungulatus* Sakai, *Studies on the crabs of Japan*, P. 129



Fig. 7. *Gaetice ungulatus* Sakai, 1939

- 1976a. *Gaetice ungulatus* Sakai, *Crabs of Japan and the Adjacent Seas*, P. 773.

*Material observed:* 1 ex, Locality: Kalapathar, Little Andaman Island, Name of collector: S. Kumaralingam, Coll. Dt: 17.01.2015, Depth: 1 to 3 meters.

### DIAGNOSTIC CHARACTERS

The two antero-lateral teeth are sharper and the third tooth much smaller. The stridulating organ composed of about eight elongate tubercles; in adult male it is composed of about 13 tubercles as aforementioned. The wrist of chelipeds has a small spine at inner angle as in the case of the young of *Gaetice ungulatus*. The fingers are characteristic, being very deeply hollowed at tip, forming a very perfect hoof.

*Distribution:* India (Kalapathar, Little Andaman). *Elsewhere:* Japan-Okinawa.

Family INACHIDAE MacLeay, 1838

Genus *Camposica* Latreille, 1829

#### 7. *Camposica retusa* Latreille, 1829 (Fig. 8)

1829. *Camposica retusa* Latreille, *Les Crustacés, les Arachnides et le Insectes, distribués en familles naturelles*, edition: 2, P. 584.
1950. *Camposica retusa* Barnard, *Descriptive catalogue of South African Decapod Crustacea (Crabs and Shrimps)*, edition: 38, P. 837.
1998. *Camposica retusa* Muraoka, Vol. 11, P.5-67.

*Material examined:* 1ex, Reg No: ZSI/ANRC-9305, Locality: Burmanaallah Station-I, Port Blair, Name of collector: S. Kumaralingam, Coll. Dt: 21.08.2013, Depth: 1 to 2 meters.

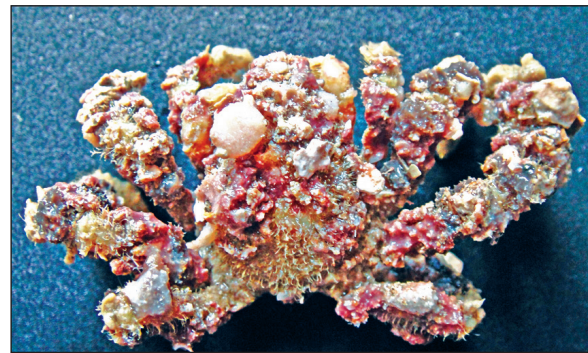


Fig. 8. *Camposica retusa* Latreille, 1829

### DIAGNOSTIC CHARACTERS

Carapace pyriform, dorsally smooth; upper orbit with a postorbital spine against which the eyestalk retracts. Eyestalks long and curved. Distal margin of basal antennal article extending beyond anterior margin of eyestalk, green (antennal) gland distinct and more or less distant from junction of basal antennal article and epistome.

*Distribution:* India (Burmanallah, Port Blair) *Elsewhere:* Red sea, South Africa and Pakistan

Family MACROPHTHALMIDAE Dana, 1851

Genus *Macrophthalmus* Latreille, 1829

Sub genus *Macrophthalmus (Chaenostoma)*  
Stimpson, 1858

8. *Macrophthalmus (Chaenostoma) lisae*  
Poupin & Bouchard, 2010 (Fig. 9)

2010. *Macrophthalmus (Chaenostoma) lisae* Poupin and  
Bouchard, *Zootaxa*, Vol. 2501, P. 61-67.



Fig. 9. *Macrophthalmus (Chaenostoma) lisae* Poupin & Bouchard, 2010

*Material examined:* 1 ex, Reg No: ZSI/ANRC-10485, *Locality:* Neil Island station -I; 1ex Neil Island station-II; Ritchie's Archipelago; South Andaman, *Name of collector:* S. Kumaralingam, Coll. Dt: 25.04.2013; 26.04.2013, *Depth:* 2 to 5 meters.

#### DIAGNOSTIC CHARACTERS

Front very narrow or moderately narrow, lateral margins not markedly diverging, strongly to slightly constricted between bases of ocular peduncles. Merus of third maxilliped subequal to ischium; fingers of male chela spooned.

*Distribution:* India (Neil Island, Ritchie's Archipelago). *Elsewhere:* Madagascar, New Caledonia.

Family PILUMNIDAE Samouelle, 1819

Genus *Ceratoplax* Stimpson, 1858

9. *Ceratoplax ciliata* Stimpson, 1858 (Fig. 10)

1858b. *Ceratoplax ciliata* Stimpson, *Proceedings of the Academy of Natural Sciences of Philadelphia*, Vol. 10, P. 93-110.

1933. *Ceratoplax ciliate* Yokoya, *Journal of the College of Agriculture*, Tokyo Imperial University, Vol. 12(1): P. 1-226.

1976a. *Ceratoplax ciliate* Sakai, *Crabs of Japan and the Adjacent Seas*, P. 773.

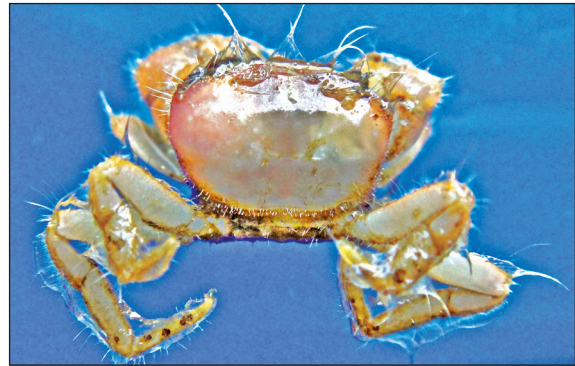


Fig. 10. *Ceratoplax ciliata* Stimpson, 1858

*Material examined:* 1ex, Reg. No: ZSI/ANRC-10662, *Locality:* Rampur, Mayabunder, *Name of collector:* S. Kumaralingam, Coll. Dt: 10.07. 2014, *Depth:* 5 to 8 meters.

#### DIAGNOSTIC CHARACTERS

The carapace is much arched longitudinally, especially in its anterior part, and straight transversely. Towards the margins it is covered with short hairs, like the sub hepatic and subbranchial regions, but the central parts of the carapace are smooth. The first segment of the abdomen of the male is broadened, but clearly falls short of the coxae of the last pair of legs; the second segment is much narrower; the terminal segment is semi-elliptical, longer than broad (Tesch, 1918).

*Distribution:* India (North Reef Island, North Andaman). *Elsewhere:* Gulf of Thailand, Indonesia and west coast of Salawati.

Family PORTUNIDAE Rafinesque, 1815

Genus *Lissocarcinus* Adams and White, 1848

10. *Lissocarcinus laevis* Miers, 1886 (Fig. 11)

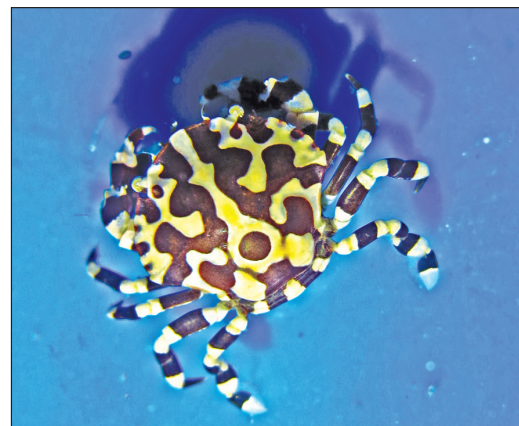


Fig. 11. *Lissocarcinus laevis* Miers, 1886

**Common Name:** Harlequin crab

1886. *Lissocarcinus laevis* Miers, *Zoology*, Vol. 17(2): P. 362.  
 1989. *Lissocarcinus laevis* Takeda, *Memoirs of the National Science Museum*, Tokyo, Vol. 22: P. 135-184.  
 1997. *Lissocarcinus laevis* Huang and Yu, *Illustrations of swimming crabs from Taiwan*, P. 181.

**Material examined:** 1 ex, Reg No: ZSI/ANRC-11253, **Locality:** Peacock Island, Diglipur, **Name of collector:** S. Kumaralingam, Coll. Dt: 21.08.2014, **Depth:** 8 to 10 meters.

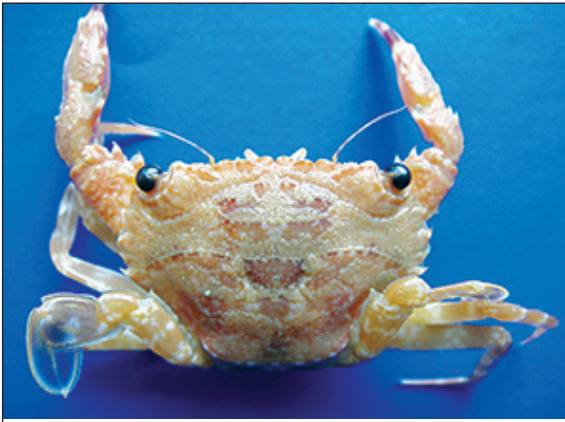
### DIAGNOSTIC CHARACTERS

Carapace conspicuously broader than long, very convex, surface smooth and glabrous; front bilobed, median notch not clear, both lobes sinuous; antero-lateral borders with 5 teeth, first the smallest, 2<sup>nd</sup>-4<sup>th</sup> subequal and rounded, 5<sup>th</sup> small and quite acute. Cheliped merus without teeth; carpus with a strong internal tooth; palm smooth except inner border of upper face.

**Distribution:** India (Landfall Island, North Andaman). **Elsewhere:** South Africa, Madagascar, Sri Lanka, Indonesia.

Genus *Thalamita* Latreille, 1829

11. *Thalamita spinimana* Dana, 1852 (Fig. 12)  
 1852c. *Thalamita spinimana* Dana, *Crustacea*, P. 685.  
 1957. *Thalamita spinimana* Stephenson and Hudson, *Australian Journal of Marine and Freshwater Research*, Vol. 8(3): 312-368.  
 1997. *Thalamita spinimana* Jeng, *Communities of decapod crustaceans around the sea*, P. 66.



**Fig. 12.** *Thalamita spinimana* Dana, 1852

**Material observed:** 1ex, **Locality:** Carlew Island, Mayabunder, **Name of Collector:** S. Kumaralingam, Coll. Dt: 20.08.2014, **Depth:** 8 to 10 meters.

### DIAGNOSTIC CHARACTERS

Front 6-lobed; carapace wide-ranging, first antero-lateral tooth entire; fourth antero-lateral tooth large; ridge on basal antennal joint with spines; 4 to 7 large spines on upper surface of hand of cheliped.

**Distribution:** India (Curlew Island, Mayabunder, Middle Andaman). **Elsewhere:** Fiji, Thailand, Taiwan, China and Australia.

Family SESARMIDAE Dana, 1852

Genus *Episesarma* de Man, 1895

12. *Episesarma chengtongense* (Serene and Soh, 1967) (Fig. 13)

**Common Name:** Pink fingered vinegar crab.

1965. *Episesarma chengtongense* Crosnier, *Faune de Madagascar*, Vol. 18: P. 1-143.



**Fig. 13.** *Episesarma chengtongense* (Serene and Soh, 1967)

**Distribution:** India (Diglipur, North Andaman). **Elsewhere:** Southern China and Southeast Asia.

13. *Episesarma palawanense* (Rathbun, 1914) (Fig. 14)



**Fig. 14.** *Episesarma Palawanense* (Rathbun, 1914)

**Common Name:** Rathbun's vinegar crab

1914. *Episesarma palawanense* Rathbun, *Proc. U.S. Nat. Mus.*, Vol. 47(2044): P. 69-85.



*Material observed: Locality:* Shastri Nagar station-I, Great Nicobar Island, *Name of the Photography:* S. Kumaralingam, Coll Dt: 22.12.2012, *Depth:* 1 to 2 meters.

#### DIAGNOSTIC CHARACTERS

Carapace is little broader than long, narrowing behind, the sub-rectangular epibranchial tooth at some little distance behind the acute orbital angle, the margin behind the second tooth slightly concave. Tubercles on dorsal margin of dactylus of chela similarly sized throughout length, numbering 40 to 50; male first gonopod with broad, rounded pectinated tip; outer surface of palm light brown with white fingertips. Maximum carapace width 4cm. inhabits mangrove adjacent to reef.

*Distribution:* India (Shastri Nagar and Campbell Bay in Great Nicobar Island). *Elsewhere:* Occurs in various parts of Southeast Asia and Nakoda Bay and Palawan Island.

Family XANTHIDAE MacLeay, 1838

Genus *Atergatis* de Haan, 1833

#### 14. *Atergatis ocyroe* (Herbst, 1801) (Fig. 15)

1801. *Atergatis ocyroe* Herbst, Vol. 3, P. 51-54.

1999. *Atergatis ocyroe* Sakai, Vol. 4, P. 1-45.

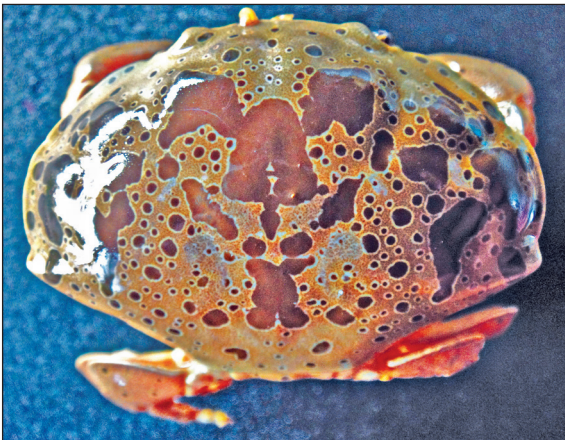


Fig. 15. *Atergatis ocyroe* (Herbst 1801)

*Material examined:* 2 Male ex Reg. No: & 1 female ex, Reg. No: ZSI/ANRC-7130, *Locality:* Kalapathar, Little Andaman Island, *Name of the Collector:* S.Kumaralingam, Coll. Dt: 12.02.2012, *Depth:* 3 to 6 meters.

#### DIAGNOSTIC CHARACTERS

Carapace transversely sub-elliptical, anterolateral borders rimmed with narrow crest.

Spotted with darker red or brown, the blotches often surrounded by a fine white line; chelipeds, legs, external maxillipeds, sternum and abdomen also more less spotted; finger and thumb of cheliped black with white tips.

*Distribution:* India (Kalapathar, Little Andaman, South Andaman). *Elsewhere:* Japan, Thailand (Phuket), Australia, Philippines, Singapore, Pakistani and South Africa.

#### 15. *Atergatis reticulatus* de Haan, 1833

(Fig. 16)

1833-1849. *Cancer (Atergatis) reticulatus* de Haan, P. 243.

1984. *Atergatis reticulatus* Serene, *Faune Tropicale*, P. 349.

1993. *Atergatis reticulatus* Yamaguchi, *Crustacea*, P. 571-598.



Fig. 16. *Atergatis reticulatus* de Haan, 1833

*Material examined:* 1 male ex, Reg. No: ZSI/ANRC- 7132, *Locality:* Harminder Bay, Little Andaman Island, South Andaman, *Name of the collector:* S. Kumaralingam, Coll. Dt: 13.02.2012, *Depth:* 1 to 3 meters.

#### DIAGNOSTIC CHARACTERS

The chelipeds have the crest on the superior margin of the palm clearly defined and generally protruding. The epibranchial angle of the carapace never has a tooth, the crest of the antero-lateral margin is continuous with the postero-lateral margin. The frontal margin is nearly straight with a feeble median fissure (Serène, 1984).

*Distribution:* India (Harminder Bay, Little Andaman Island, South Andaman). *Elsewhere:* Japan, Tokyo Bay, Korea, China and Taiwan.

Genus *Xanthias* Rathbun, 1897

16. *Xanthias latifrons* (de Man, 1887) (Fig. 17)  
1887. *Panopeus latifrons* de Man, *Archiv für Naturgeschichte*, Vol. 53(1): P. 215-288.  
1894. *Xanthodes minutus* Rathbun, *Proceedings of the United States national Museum*, Washington, Vol. 16(933): P.223-260.  
1906. *Xanthias minutes* Rathbun, *Bulletin of the United States Fish Commission*, Vol. 23(3): P. 827-930.  
1967. *Xanthias latifrons* Guinot, *Mémoires de l'Institut fondamental d'Afrique Noire*, Vol. 77(1966): P. 235-352.

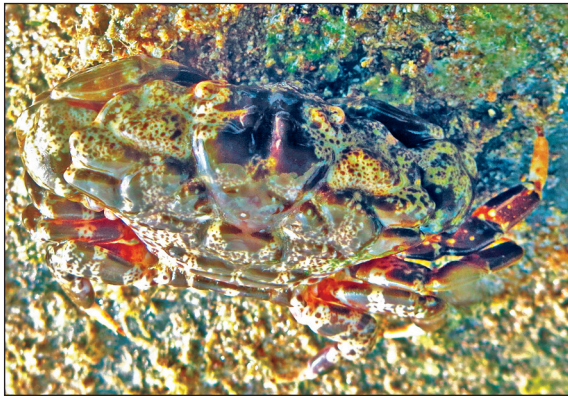


Fig. 17. *Xanthias latifrons* (de Man, 1887)

*Material observed:* 1 ex, *Locality:* Pathar Nallah, Little Andaman Island, *Name of the Collector:* S. Kumaralingam, Coll. Dt: 18.01.2015, *Depth:* 2 to 5 meters.

**DIAGNOSTIC CHARACTERS**

The regions of carapace pleasingly defined by rather deep grooves, Front nearly one third as broad as the greatest width of carapace, the free margins are slightly arcuate and the median notch shallow, they are separated from the supraorbital border by a broad shallow sinus. Of the four antero-lateral teeth, the first is very low and completely fused with the orbital angle, the second is also very low, while the third and fourth are somewhat obtusely angular. The basal antennal segment is slightly longer than broad, having no lobule at its tip. Chelipeds are subequal, the wrist has two obtuse teeth at the inner angle and its upper and outer surfaces are covered with 7 to 8 nodules, which are circumferenced by smooth grooves; palm has two indistinct grooves on outer surface. Ambulatory legs are very slender and naked excepting the setae of the dactylus.

*Distribution:* India (Pathar Nallah, Little Andaman). *Elsewhere:* Indonesia, Red sea, Japan and Hawaiian Islands.

Genus *Macromedaeus* Ward, 1942

17. *Macromedaeus orientalis* (Takeda & Miyake, 1969) (Fig. 18)  
1969f. *Microcassiope orientalis* Takeda and Miyake, *OHMU*, Vol. 2(9): P. 2195-206.  
1976. *Macromedaeus orientalis* Yamaguchi and Tokudome, *Calanus*, Vol. 5: P. 31-46.  
1987. *Macromedaeus orientalis* Yamaguchi et al, *Calanus*, Vol. 10: P. 1-71.



Fig. 18. *Macromedaeus orientalis* (Takeda & Miyake, 1969)

*Material examined:* 1 male ex, Reg. No: ZSI/ANRC-8329, *Locality:* Burmanallah station-III, *Name of the collector:* S. Kumaralingam, Coll. Dt: 24.01.2013, *Depth:* 1 to 2 meters.

**DIAGNOSTIC CHARACTERS**

The carapace is transversely oval and moderately convex fore and after as well as from side to side The eyestalk is very stout and armed with several granules just near the cornea and at the proximal part. The antero-lateral border of the carapace is armed with four teeth excluding the external orbital angle; the teeth are subacute at the tips, directing obliquely forwards and somewhat upwards; the posterior tooth is more strongly directed obliquely outwards than the preceding one; the first is slightly smaller than the last three subequal teeth.

*Distribution:* India (Burmanallah, South Andaman). *Elsewhere:* Japan, Sagami Bay, East coast of Kii peninsula and Amakusa.

Genus *Nanocassiope* Guinot, 1967

18. *Nanocassiope alcocki* (Rathbun, 1902)

(Fig. 19)

- 1902b. *Xanthias alcocki* Rathbun, *Bulletin of the Museum of Comparative Zoology at Harvard College*, Vol. 29(5): P. 123-138.
1925. *Micropanope alcocki* Odhner, *Göteborgs Kungliga Vetenskaps-och Vitterhets-Samhälles Handlingar*, Vol. (4) 29(1): P. 1-92.
- 1967c. *Nanocassiope alcocki* Guinot, *Bulletin du Muséum national d'Histoire naturelle*, Vol. (2) 32(2): P. 345-374.
1998. *Nanocassiope granulipes* Muraoka, *Prefectural Museum of Natural History*, Vol. 11: P.5-67.



Fig. 19. *Nanocassiope alcocki* (Rathbun, 1902)

*Material observed:* 1 ex, *Locality:* Sound Island, Mayabunder, *Name of the Collector:* S. Kumaralingam, *Coll. Dt:* 25.06.2012, *Depth:* 8 to 10 meters.

#### DIAGNOSTIC CHARACTERS

The carapace and thoracic appendages are quite naked, the former is transversely oval in outline and the front relatively broad and divided into two lobes, which are straight and microscopically granulated, each of which is externally separated from the supraorbital border by a small notch. Chelipeds are slightly asymmetrical, the right one being a little larger; the arm is short and high, its superior border crested and its inner surface very flat (Sakai, 1939)

*Distribution:* India (Sound Island, Mayabunder, Middle Andaman). *Elsewhere:* Madagascar, Maldives, Japan and Korea.

Genus *Leptodius* A. Milne Edwards, 1863

19. *Leptodius davaoensis* Ward, 1941 (Fig. 20)

1907. *Leptodius exaratus* Nobili, *Memorie della Reale Accademia delle Scienze di Torino*, Vol. (2)57: P. 351-430.

1961. *Leptodius leptodon* Forest and Guinot, *Crustacés Décapodes Brachyours de Tahiti et des Tuamotu*, P. 195.

1998. *Leptodius leptodon* Shokita and Iriondo, *Ann. Report Interdiscipl. Res. Inst. Environ. Sci.* Vol. 17: P. 61-71.

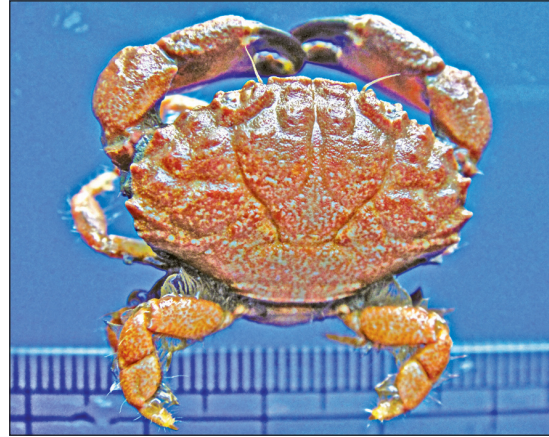


Fig. 20. *Leptodius davaoensis* Ward, 1941

*Material observed:* 1 ex, *Locality:* Shastri Nagar station-II, *Name of the Collector:* S. Kumaralingam, *Coll. Dt:* 07.03.2013, *Depth:* 1 to 2 meters.

#### DIAGNOSTIC CHARACTERS

The carapace and chelipeds have their surfaces granular or smooth, sometimes finely punctate. There are 4 teeth behind the exorbital angle. The carapace is less convex dorsally and the regions less projecting, they are smooth or finely granular, separate by broad, shallow furrows. The exorbital angle is acute and the antero-lateral teeth project. The median node of the front is slightly open. (Serène, 1984)

*Distribution:* India (Shastri Nagar, Campbell Bay, Great Nicobar). *Elsewhere:* Philippines, Palau, Santa Cruz Islands and Japan.

Subfamily LIOMERINAE Sakai, 1976

Genus *Liomera* Dana, 1851

20. *Liomera pallida* (Borradaile, 1900)

(Fig. 21)

1900. *Carpliodes pallidus* Borradaile, *On the Stomatopoda and Macrura brought by Dr. Willey from the South seas*. P. 395-428.
1902. *Carpliodes pallidus* Borradaile, *Marine crustaceans III: The Xanthidae and some other crabs*, P. 237-271.
1967. *Liomera pallid* Guinot, *Bull. Mus. Natn. Hist. Nat.* Paris, Vol. 39(3): P. 540-563.
1984. *Liomera (Liomera) pallid* Serene, *Faune Trop.* Vol. 24: P. 1-400.



Fig. 21. *Liomera pallida* (Borradaile, 1900)

*Material observed:* 1 ex, *Locality:* North Bay, *Name of the Collector:* S. Kumaralingam, Coll. Dt: 25.01.2013, *Depth:* 2 to 3 meters.

#### DIAGNOSTIC CHARACTERS

Carapace with well marked regions; finely granulate; anterolateral margins with four obsolete lobes; the regions of carapace much less projecting and separated by more slender and lesser burrows; different sized round granules evenly distributed on carapace, chelipeds and walking legs; light brown patches present in the centre of carapace; dark brown blotches on merus of first to third walking legs; no such blotch on merus of last walking leg; half of moving and fixed fingers of chelipeds with dark chocolate brown.

*Distribution:* India (North Bay, Port Blair, South Andaman). *Elsewhere:* Maldives, Gilbert Island, Singapore, Cocos-Keeling Islands, Western Australia, French Polynesia and Gambier Archipelagos and Hawaii.

Infraorder ANOMURA MacLeay, 1838

Family PORCELLANIDAE Haworth, 1825

Genus *Lissoporcellana* Haig, 1978

#### 21. *Lissoporcellana spinuligera* (Dana, 1853) (Fig. 22)

1852–1853. *Porcellana armata* Dana, *Crustacea*. P. 685.

1858. *Porcellana latifrons* Stimpson, *Proceedings of the Academy of Natural Sciences of Philadelphia*, Vol. 10: P. 225-252.

1968b. *Pisidia spinuligera* Nakasone and Miyake, *OHMU (Occasional Papers of Zoological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan)*, Vol. 1: P. 97-111.

1978. *Lissoporcellana spinuligera* Haig, *Proceedings of the Biological Society of Washington*, Vol. 91. P. 706–714.



Fig. 22. *Lissoporcellana spinuligera* (Dana, 1853)

*Material examined:* 1 ex, Reg. No: ZSI/ANRC-10663, *Locality:* Rampur, Mayabunder, *Name of the Collector:* S. Kumaralingam, Coll. Dt: 10.07.2014, *Depth:* 1 to 2 meters.

#### DIAGNOSTIC CHARACTERS

Carapace slightly longer than extensive; branchial margins each with 3 spines. Rostrum strongly dentate on anterior margin; median lobe with distinct notch on anterior margin. Carpi of chelipeds each armed with 3 spines including distal spine on dorso-extensor margin. Dactyli of ambulatory legs each with 3 or 4 slender corneous spines on flexor margin, excluding much larger distal spine on elevated broad base, and with long terminal claw (Osawa, 2010).

*Distribution:* India (Rampur, Mayabunder, Middle Andaman). *Elsewhere:* Hong Kong, Gulf of Thailand, Singapore, and north to the Ryukyu Islands.

Genus *Petrolisthes* Stimpson, 1858

#### 22. *Petrolisthes asiaticus* (Leach, 1820) (Fig. 23)

1820. *Pisidia asiatica* Leach, *Dictionnaire des Sciences Naturelles*, Vol. 18: P. 49-56.

1892. *Petrolisthes leporinoides* Ortmann, Vol. 6: P. 241-326.

1937c. *Petrolisthes yaeyamensis* Miyake, *Zoological Magazine*, Vol. 49: P. 157–158.

1942. *Petrolisthes asiaticus* Miyake, *The Palau Tropical Biological Station Studies*, Vol. 2: P. 329–379.



Fig. 23. *Petrolisthes asiaticus* (Leach, 1820)

*Material examined:* 1 ex, Reg. No: ZSI/ANRC-8332, *Locality:* Burmanallah station-IV, South Andaman, *Name of the Collector:* S. Kumaralingam, Coll. Dt: 24.01.2013, *Depth:* 0.5 to 1 meters.

#### DIAGNOSTIC CHARACTERS

Carapace with short delicate striae on gastric region; rostrum trilobate; no supra-ocular spine; brachial margins convex, each with epibranchial spine at anterior angle of cervical groove. Second article of antennal peduncle with distinct anterior lobe. Chelipeds with numerous short, squamiform ridges on dorsal surface; dactyli each with 3 corneous spines on flexor margin. Ridges on surfaces with sparse short setae on anterior margins (Osawa, 2010).

*Distribution:* India (Burmanallah, South Andaman). *Elsewhere:* China, Taiwan, south Japan (from Kii Peninsula to Ryukyu Islands), Mariana Islands, Palau, North Australia and Caroline Islands.

#### 23. *Petrolisthes pubescens* Stimpson, 1858 (Fig. 24)



Fig. 24. *Petrolisthes pubescens* Stimpson, 1858

1858. *Petrolisthes pubescens* Stimpson, *Proceedings of the Academy of Natural Sciences of Philadelphia*, Vol. 10: P. 225–252.

1943. *Petrolisthes tomentosus* Miyake, *Journal of the Department of Agriculture*, Vol. 7: P. 49-158.

*Material examined:* 1 ex, *Locality:* Burmanallah station-IV, South Andaman, *Name of the Collector:* S. Kumaralingam, Coll. Dt: 21.01.2014, *Depth:* 0.5 to 1 meters.

#### DIAGNOSTIC CHARACTERS

Carapace covered with short setae on dorsal surface, setae concealing very short delicate striae; rostrum trilobate; no supra-ocular spine; brachial margins convex, each with epibranchial spine at anterior angle of cervical groove. Second article of antennal peduncle with distinct anterior lobe bearing small spine at anteroproximal angle.

*Distribution:* India (Burmanallah, South Andaman). *Elsewhere:* Sea, Mauritius, Moluccas, Taiwan, southern Japan, Ryukyu Islands and Queensland.

#### 24. *Petrolisthes hastatus* Stimpson, 1858 (Fig. 25)



Fig. 25. *Petrolisthes hastatus* Stimpson, 1858

1858. *Petrolisthes hastatus* Stimpson, *Proceedings of the Academy of Natural Sciences of Philadelphia*, Vol. 10: P. 225–252.

1862. *Porcellana inermis* Heller, *Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien*, Vol. 12: P. 519-528.

*Material examined:* 1 ex, Reg. No: ZSI/ANRC- 8333, *Locality:* Burmanallah station-II, South Andaman, *Name of the Collector:* S. Kumaralingam, Coll. Dt: 24.01.2013, *Depth:* 0.5 to 1 meters.

### DIAGNOSTIC CHARACTERS

Carapace with numerous short, delicate striae on gastric region and anterior branchial region; rostrum sinuously triangular; no supra-ocular spine; brachial margins convex, unarmed at anterior angle of cervical groove. Second article of antennal peduncle with distinct anterior lobe. Chelipeds with numerous short striae and small flattened tubercles on dorsal surface; Ridges on surfaces with sparse short setae on anterior margins (Osawa, 2010).

*Distribution:* India (Burmanallah, South Andaman). *Elsewhere:* Singapore, northward to Tokara Islands in Japan; New Guinea eastward to New Caledonia, Fiji, and Samoa.

#### 25. *Petrolisthes fimbriatus* Borradaile, 1898 (Fig. 26)

1898. *Petrolisthes fimbriatus* Borradaile, *Proc. Zool. Soc.*, P. 457-468.

1942. *Petrolisthes fimbriatus* Miyake, *Trop. Biol. Sta. Stud.* Vol. 2: P. 329-379.

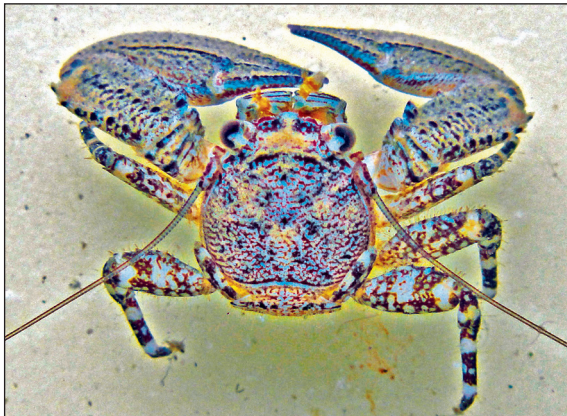


Fig. 26. *Petrolisthes fimbriatus* Borradaile, 1898

*Material examined:* 1 ex, *Locality:* Shastri Nagar station-I, Great Nicobar Island, *Name of the Collector:* S. Kumaralingam, Coll. Dt: 22.12.2012, *Depth:* 1 to 2 meters.

### DIAGNOSTIC CHARACTERS

Carapace smooth, sparsely setose; with an epibranchial spine. Front broad, rostrum indistinctly trilobite, middle lobe most projecting; no supraocular spine. Cheliped subequal or slightly unequal. Carpus with three teeth on anterior margin and two to three on posterior margin; carpus of walking legs without anterodistal spines (Kropp, 1985).

*Distribution:* India (Shastri Nagar, Great Nicobar Island). *Elsewhere:* New Guinea (Irian Jaya), Palau, Marshall Islands and Tonga Islands.

#### Superfamily GALATHEOIDEA Samouelle, 1819

#### Genus *Allogalathea* Baba, 1969

#### 26. *Allogalathea elegans* (Adams & White, 1848) (Fig. 27)

1848. *Galathea elegans* Adams & White, *Crustacea*, P. 66.

1852. *Galathea longirostris* Dana, *Crustacea*, P. 685.

1990. *Allogalathea elegans* Baba, *Bulletin du Muséum National d'Histoire Naturelle*, P. 1-975.



Fig. 27. *Allogalathea elegans* (Adams & White, 1848)

*Material examined:* 1 ex, Reg. No: ZSI/ANRC-11259, *Locality:* Peacock Island, Diglipur, *Name of the collector:* S. Kumaralingam, Coll. Dt: 21.08.2014, *Depth:* 10 to 15 meters.

### DIAGNOSTIC CHARACTERS

Carapace with distinct transverse striae, cervical groove distinct. Basal article of antennule with 3 terminal spines. Mxp3 merus with 2 or 3 flexor spines and 1 extensor distal spine. Weak in armature; dactyli with 4 or 5 flexor spines, distal much larger (Adams & White, 1848).

*Distribution:* India (Oliver Island, Mayabunder, Middle Andaman, Gulf of Mannar and Bay of Bengal). *Elsewhere:* Indo-West Pacific: South Africa (Durban), Mozambique, Red Sea, Madagascar, Seychelles, Cargados Carajos, Sri Lanka and Gulf of Martaban (Burma).

### SUMMARY

A total of 26 species belongs to 22 genera of crabs were identified under the families

Dromiidae, Epialtidae, Grapsidae, Inachidae, Macrophthalmidae, Pilumnidae, Portunidae, Sesarmidae, Xanthidae, Porcellanidae, Galatheididae.

Dev and Nandi (2012) provided a checklist of Brachyurans crabs from Andaman and Nicobar Islands. The new records made through the present study enhance the database of brachyuran crabs to 53b species belonging to 248 genera and 5b families in Andaman and Nicobar islands.

Prakash *et al.* (2013) presented a checklist of porcellanid crabs from India, however in the present paper 5 species *Lissoporcellana spinuligera* (Dana, 1853), *Petrolisthes asiaticus* (Leach, 1820), *Petrolisthes pubescens* Stimpson, 1858, *Petrolisthes hastatus* Stimpson, 1858, *Petrolisthes fimbriatus* Borradaile, 1898 were added which make a total of 35 species belonging to 11 genera under the family Porcellanidae.

Venkataraman *et al.* (2004) reported a checklist

of Galatheididae crabs from Indian waters in which the present report added 1 new record (*Allogalatheia elegans* (Adams & White, 1848) from Andaman Islands, making a total of 22 species belonging to 6 genera under the said family.

Further intensive survey on coral reef ecosystems may bring out several species of brachyuran crabs to Indian account.

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#### REFERENCES

- Adams, A. and White, A. (1848). Crustacea. (Adams, A., Ed.). The Zoology of H. M. S. Samarang; under the command of Captain Sir Edward Belcher, C. B., F. R. A. S., F. G. S. during the years 1843&1846. viii + 66 pp., pls 1-13.
- Alcock, A. 1899a. Materials for a Carcinological Fauna of India.No-IV. The Brachyura: *Cyclometopa*. Part II. A revision of the *Cyclometopa* with an account of the families Portunidae, Cancridae and Corystidae. *J. Asiat. Soc. Bengal.* **68**(2): 1-104.
- Alcock, A. 1899b. The families Portunidae, Cancridae and Corystidae: The Brachyura *Cyclometopa*, Part II. Materials for a Carcinological Fauna of India, No. 4 *J. Asiat. Soc. Bengal*, **68**(II: I): 1-104.
- Alcock, A. 1901. Materials for a Carcinological Fauna of India.No-6. The Brachyura: *Catometopa* or *Grapsoidae*. *J. Asiat. Soc. Bengal*, **69**(3): 279-486.
- Borradaile, L.A. 1903. Marine Crustaceans. II. Portunidae (Ed.) J.S. Gardiner, The fauna and geography of the Maldive and Laccadive archipelagos. **1**: 199-208.
- Chhapgar, B.F. 1957. Marine Crabs of Bombay State. Dept of Fisheries-Bombay, At the Diocesan Press, Madras-1958, C8243.
- Chopra, B. 1930. Further Notes on Crustacea Decapoda in the Indian Museum. 1. On two new species of Hymenosomatid Crabs, with notes on some other species. *Records of the Indian Museum*, **32**(4): 413-429.
- Chopra, B. 1931. Further Notes on Crustacea Decapoda in the Indian Museum. 2. On some Decapod Crustacea found in the cloaca of Holothurians. *Records of the Indian Museum*, **33**(3): 303-324.
- Dai, A. and Yang, S. 1991. Crabs of the China Seas, i-iv, 1-608, figs 1-295, pls 1-74. China Ocean Press, Beijing and Springer-Verlag, Berlin Heidelberg New York Tokyo, English edition. (Translation from Chinese original 1986.)

- Dev Roy, M.K. and Das, A.K. 2000. Taxonomy, Ecobiology, and Distribution pattern of the Brachyuran Crabs of Mangrove Ecosystem in Andaman Islands. *Records of zoological Survey of India, Occasional Paper No. 185*: 1-211.
- Deb, M. 1985a. A new genus and species of portunid crab (Crustacea) from North Andaman. *Bull. Zool. Sury. India*, **7**(23): 173-177.
- Deb, M. 1985b. A new species of *Serenius guinot* 1976 (Crustacea: Decapoda: Xanthidae) from Andamans. *Bull. Zool. Sury. India*, **7**(23): 207-210.
- Deb, M. 1992. Two new species of Xanthid Crabs from Bay Islands. *Journal of the Andaman Science Association*, **8**(2): 121-124.
- Dev Roy, M.K. and Nandi, N.C.(2005). Brachyuran Diversity of Coral Reef Ecosystem in India *Proceeding of the National Seminar on Reef Ecosystem Remediation* SDMRI Research Publication No. **9**: 220-221.
- Dev Roy, M.K. and Nandi, N.C. (2012). Brachyuran Crabs (Crustacea) *Fauna of Andaman and Nicobar Islands, State Fauna Series*, **19**(1): 185-236.
- Gravely, F.H. 1927. Crustacea In: The littoral fauna of Krusadai Island in the Gulf of Mannar. *Bull. Madras Govt. Mus. (n.s.)* I, no. 1, pp. 141-155, pls. xx-xxvi.
- Jameson, J.D., Murugan, A. and Natarajan, P. 1982. Studies on the distribution pattern and morphology of *Scylla Serrata* along Tuticorin coast. *Seafood export.*, **14**: 17-20.
- Jeyabaskaran, R. and Venkataraman, K. 1999. Mass mortality of trapezian crabs in coral reefs of gulf of mannar (Southeast coast of India). Proceedings of the International Seminar on Sustainable use of Indian Ocean: A SAARC Perspective, September 22-23, 1998, Vigyan Bhawan, New Delhi.
- Jeyabaskaran, R., Khan, S.A. and Ramaiyan, V. 2000. Brachyuran Crabs of Gulf of Mannar. Annamalai University, Centre of Advanced Study in Marine Biology: Parangipettai: PP. 1-99, Pls. 1-78.
- Kariathil, T.J., Raffi, S.M., Ajmal Khan, S. and Kannan, L. 2002. Biodiversity, Species Composition, Distribution and Relative abundance of Crabs in Reef Ecosystems of Campbell Bay, Great Nicobar Island. *SDMRI Research Publication No. 2*: 125-131.
- Kropp, R.K. and Manning, R.B. 1985. Cryptochiridae, the correct name for the family containing the Gall Crabs (Crustacea: Decapoda: Brachyura). *Proc. Biol. Soc. Wash.* **98**(4): 954-955.
- Kumaralingam, S., Madhan Chakkaravarthy, V. and Raghunathan, C. 2009. New records and range extension of three mangrove brachyuran crabs: *Chiromantes obtusifrons*, *Macrophthalmus japonicus* and *Thalamita coeruleipes* from Andaman and Nicobar Islands, India. *Biosystematica*, 2010, **4**(2): 29-36.
- Kumaralingam, S., Sivaperuman, C. Raghunathan, C. 2012 Diversity and Distribution of Brachyuran Crabs from Ritchie's Archipelago. *Int. J. Oceanogr. Marine Ecol. Sys.*, **1**(2): 60-66.
- Osawa, M. and T.Y. Chan. 2010. Part III Porcellanidae (Porcelain crabs); p. 67-181 in T.-Y. Chan (ed.). Crustacean Fauna of Taiwan: Crba-like Anomurans (Hippoidea, Lithoidoidea and Porcellanidae). Keelung: National Taiwan University. 197 p.
- Poupin J, Juncker M (2010) A guide to the decapods crustaceans of the South Pacific. Published by CRISP and SPC, noumea, New Caledonia, PP. 320 (366 Photographs).
- Prakash, S., Ajith Kumar, T.T., & Khan, S. A., 2013. Checklist of the Porcellanidae (Crustacea: Decapoda: Anomura) of India. *Check List*, **9**(6): 1514-1518.



- Premkumar, V.K. and Daniel, A. 1971. Crustaceans of economic value of Great Nicobar Island. 2. Decapoda: Brachyura: Portunidae. *J. Zool. Soc. India*, **23**(2): 109-112.
- Pretzmann, G. 1984. Results of the Australian-Indian Hydrobiological Mission 1976 to the Andaman Islands. Part III. Brachyura from the Andaman Islands. *Annl.Nature. Mus. Wien*, **86**: 141-144.
- Reddy, K.N. and Ramakrishna, G. 1972. On the pagurid crabs (Crustacea: Decapoda) from Andaman and Nicobar Islands. *Rec. zool. Surv. India*, **66**(1-4): 19-30.
- Sakai, T. 1939. Studies on the crabs of Japan. IV. Brachygnatha, Brachyrhyncha, pp. 365-741, figs 1-129, pls. 42-111, table 1. Yokendo Co., Tokyo.
- Sakai, T. 1976. Crabs of Japan and the Adjacent Seas. In three Volumes: English Text, PP. XXIX+773 pp., Japanese Text, pp. 1-461, Plates Volume, pp. 1-16. 1-251. Kodansha Ltd., Tokyo.
- Sankarankutty, C. 1961. On Decapoda Brachyura from the Andaman and Nicobar Islands. 1. Families Portunidae, Ocypodidae, Grapsidae and Mictyridae. *J. mar. biol. Ass. India*, **3**(1-2): 101-119.
- Sankarankutty, C. 1962a. On Decapoda Brachyura from the Andaman and Nicobar Islands. 2 Family Xanthiidae. *J. mar. biol. Ass. India*, **4**(1): 121-150.
- Sankarankutty, C. 1962b. On Decapoda Brachyura from the Andaman and Nicobar Island. 3. Families Calappidae, Leucosiidae, Parthenopidae, Maiidae and Gecarcinidae. *J. mar. biol. Ass. India*, **4**(1): 151-164.
- Serène, R. 1984. Crustacés Décapodes Brachyours de l'Océan Indien occidental et de la Mer Rouge, Xanthoidea: Xanthidae et Trapeziidae. Avec un addendum par Crosnier (A): Carpiliidae et Menippidae. Faune Tropicale, no. **XXIV**: 1-349, figs A-C + 1-243, pls. 1-48. (In French) (Translated into English by R.W. Ingle).
- Sethuramalingam, S. and Ajmal Khan, S. 1991. Brachyuran crabs of Parangipettai coast, CAS in Marine Biology publication, Annamalai University, India, 92 pp.
- Soundarapandian, P., John Samuel, N. Racichandran, S. and Kannupandi, T. 2008. Biodiversity of crabs in pichavaram mangrove environment, South East Coast of India. *Int. J. Zool. Res.*, **4**: 113-118.
- Tesch, J.J. 1918. The Decapoda Brachyura of the Siboga-Expedition. II. Goneplacidae and Pinnotheridae. Siboga Expeditie Monografie, 39 Cl, livr. **84**: 149-295, pls 7-18.
- Venkataraman, K., Jeyabaskaran, R., Raghuram, K.P. and Alfred, J. R. B., 2004. Bibliography and Checklist of Corals and Coral Reef Associated Organisms of India, *Rec. zool. Surv. India*, Occ. Paper No. **226**: 1-468.