Chapter 10

Lobsters

E.V.Radhakrishnan

Lobsters are the most highly priced crustaceans in all parts of the world. They have great demand in the domestic market as a delicacy and is a foreign exchange earner for the country. The estimated total landing of lobsters in 2012-13 is 1546 t. In the monumental work of Holthuis (1991), a detailed account was provided for almost all the living marine lobster species up to 1991. The taxonomy of marine lobsters underwent dramatic changes with the application of newly developed molecular markers in phylogenetic analysis concluding that lobsters are indeed a monophyletic group, if the thalassinideans are excluded.(Tsang *et al*., 2008).

The suborder Macrura Reptantia has four infraorders: Astacidea, Glypheidea, Achelata and Polychelida. Chan (2008) provided a checklist of the currently recognized six families, 55 genera and 248 species (with four subspecies) of living marine lobsters. Although Caroli Linnaeus himself described the first marine lobster in 1758, the discovery rate of marine lobsters remains high to this day (Chan, 2008). Although the catalog of marine lobsters of the world by Holthuis (1991) had encompassed almost all the species known at that time, there have been many new discoveries in the last two decades. Nearly, 11.7% (29 species) of marine lobsters were only described in the last decade (since 2000). Few new records have also been added to the Indian list of marine lobsters due to the expansion of commercial fishing activities to deeper areas.

The synonyms still used in taxonomic literature after 1960 are given. If the original name given for a taxon is different from its current generic allocation and/or usage (or recent usage for synonyms), the original name is provided at the end of the name in square brackets (Chan, 2008). It is important to point out that some species still have unsettled taxonomic and nomenclatural issues.

The taxonomy of known species of lobsters from Indian coast and the two island systems is described here. The current list includes 5 families, 3 subfamilies, 16 genera and 30 species.

Taxonomic status

Phylum : Arthropoda
Subphylum: Crustacea
Class: Malacostraca
Subclass: Eumalacostraca
Superorder: Eucarida
Order: Decapoda
Suborder: Macrura Reptantia

Infraorder: Achelata Scholtz & Richter, 1995
Family: Palinuridae Latreille, 1802 [Palinurini]

Key to Families (after Holthuis, 1991)

Antennal flagellum long and consisting of numerous small articles, whip-like or spear-like. Rostrum absent or visible as a small spine on anterior margin of carapace. Carapace with a pair of frontal horns above the eyes, and usually with spines on the dorsal surface; hairs on carapace, if present, few and scattered …….Palinuridae

Key to genera occurring in the area

Two distinct widely separated tooth-like frontal horns, between which the anterior margin of the carapace is visible; antennal flagella quite flexible; flagella of antennules long, whip-like, longer than peduncle of antennules; antennular plate and stridulating organ present……..*Panulirus*

Frontal horns with a single tooth on anterior margin; pleura of second to fifth abdominal segments ending in two about equally strong teeth, antennular plate and stridulating organ present; carapace strongly ridged……..*Puerulus*

Frontal horns fused to a quadrangular median process, with 2 points placed over bases of eyes; antennal flagella straight, inflexible……..*Linuparus*

Antennular plate narrow, unarmed; Major supraorbital processes terminating in a blunt crenulated margin; two spines on anterior straight margin of carapace between the supraorbital processes; first peduncular joint of antennae extending beyond end of peduncle of antennules……..*Palinustus*

There are 11 genera in this family. *Jasus, Justitia,* ***Linuparus****, Nupalirus, Palibythus, Palinurus,* ***Palinustus****,* ***Panulirus,*** *Projasus,* ***Puerulus****, Sagmariasus* (those in bold letters are represented in India)

Genus ***Panulirus*** White, 1847
George and Main (1967) recognize nineteen species within this genus in tropical and subtropical waters of the Indian, Pacific and Atlantic oceans. Six of these occur along the Indian coast.

Key to species of *Panulirus* recorded off the Indian coast and the Island groups, Andaman Nicobar Islands and the Lakshadweep Islands

1 Abdominal segments 2-5 with transverse grooves ……..2
Abdominal segments 2-5 without transverse grooves or with indistinct grooves in juveniles only …… 4

2 Margin of transverse abdominal grooves with squamae varying from well developed and even in size to minute and irregular in size. Overall colour ranges from brownish-red in specimens with large squamae to olive green in specimens with minute squamae …… ***P. homarus***
Margin of transverse abdominal grooves with no trace of squamae…….3

3 Antennular plate (between the stridulating organs) with 2 pairs (4) of subequal principal spines, fused at their bases. Supraorbital horns rounded in cross-section. Overall colour olive-black……..***P. penicillatus***
Antennular plate with 1 pair (2) of equal principal spines; supraorbital horns flattened bilaterally. Overall colour purplish-red with abdomen covered with conspicuous white spots……***P. longipes***
Antennular plate with 1 pair of equal spines; white band on each abdominal segment. Legs with white spots. Colour Olive green…….. ***P.polyphagus***

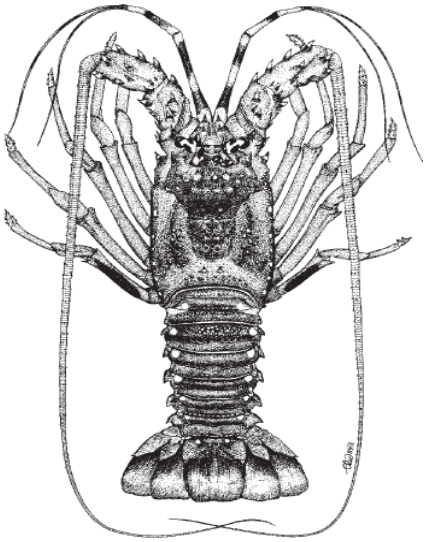
4 Conspicuous transverse white band posteriorly on each abdominal segment. Legs with longitudinal white stripes. Juveniles have whie antennae. Overall colour black and green ……***P. versicolor***
No transverse white band on abdominal segments but above each pleural spur is a conspicuous white spot. Legs with irregular transverse mottling, no longitudinal stripes. Overall colour bluish green……***P. ornatus***

Panulirus homarus (Linnaeus, 1758) [*Cancer homarus*]
Panulirus dasypus (H. Milne Edwards, 1837)[*Palinurus dasypus*]
Panulirus burgeri De Haan, 1841)[*Palinurus burgeri*]
English name: Scalloped spiny lobster

Diagnosis: Carapace without a rostrum; antennae enlarged, cylindrical, longer than body; Anterior margin of carapace with two frontal horns; antennular plate with 4 equal, large well-separated spines, arranged in a square; pleura of second to fifth abdominal segments ending in a strong tooth with denticles on posterior margin. Each abdominal segment with a transverse

groove interrupted in the middle; its anterior margin formed into shallow scallops. Colour dark greenish to blackish with numerous very small white spots; legs with indistinct spots and stripes of white. Specimens with this morphology are called microsculpta form.

There are three subspecies: *Panulirus homarus homarus* (Linnaeus, 1758), *P. homarus rubellus* (Berry, 1974) and *P. homarus megasculpta* (Pesta, 1915) [*Panulirus burgeri megasculpta*]. The subspecies in India is *P. homarus homarus,* which is the microsculpta form and no other subspecies is present along the Indian coast (Jeena, 2013). *P. homarus rubellus* is the southern *megasculpta* form found along the coast of Southeast Africa, Mozambique to Natal and southeast Madagascar. *P. homarus megasculpta* is the northern megasculpta form which is known from the Arabian coast.



Range distribution: The *P. homarus homarus* subspecies has a broad geographic range extending from East Africa to Japan including Indonesia, Australia, New Caledonia and the Marquesas Archipelago (Holthuis, 1991). Northwest, southwest, southeast coast of India, A & N Islands and Lakshadweep Islands.

Habitat and ecology: The species is commonly found in very shallow water (1-15m), although can be found to depths of 90m. It inhabits rocky reefs for shelter (Holthuis, 1991).

Biology: Maximum total length 31 cm, carapace length 12 cm. Average total length 20 to 25 cm. Major fisheries are on the southeast and southwest coast of India. The commercial fishery at Muttom, Kanyakumari district was found *to* be largely supported by 1st and 2nd year animals. At

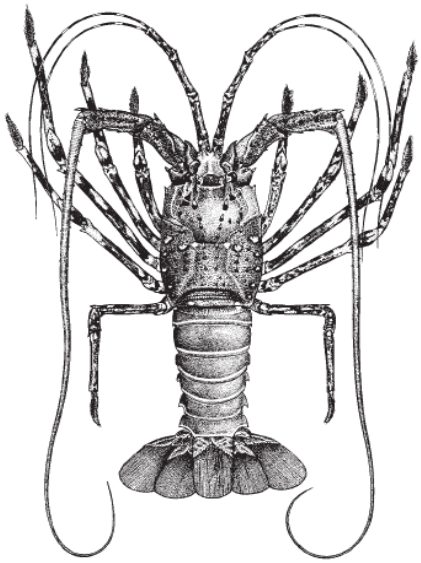
a given carapace length females are heavier than males. Females attain functional maturity at a carapace length (CL) of 55 mm. Males attain maturity at 63 mm CL on the basis of allometric growth of III walking leg. Peak breeding season is from November to December.

Panulirus polyphagus (Herbst, 1793) [*Cancer (Astacus) polyphagus*]
Panulirus fasciatus Fabricius, 1798 [*Palinurus fasciatus*]
Panulirus orientalis Doflein, 1900

Diagnosis: Abdominal somites smooth, without transverse groove. Surface of abdominal somites naked and smooth. Exopod of third maxilliped absent; antennular plate with two strong spines; colour grayish-green, abdominal somites 2 to 5 with transverse white bands along the posterior margin. Legs irregularly spotted.

Range distribution: This species has a broad range from Pakistan and India to Vietnam, the Philippines, Indonesia, northwest Australia and the Gulf of Papua (Holthuis, 1991).

Habitat and ecology: The species is commonly found in coastal waters on muddy and rocky substrates to a depth of 40 m, although it is occasionally seen at 90 m and is often seen near the river mouth (Holthuis, 1991).

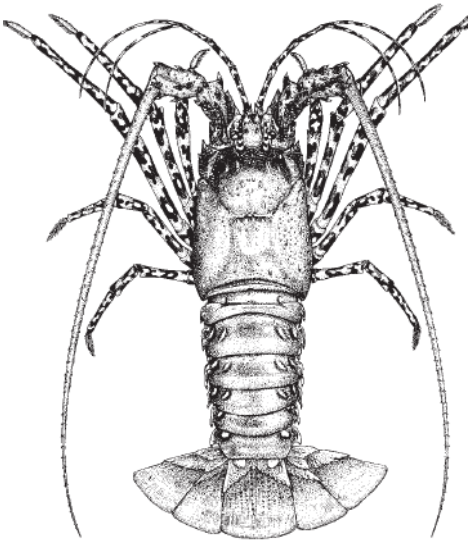


Biology: This species is the most important commercial species contributing to nearly three-fourth of the total lobster catch of the country. Major fisheries are on the northwest coast of India. The size in the fishery ranged from 75 mm to 385 mm total length (TL), those between 160 mm and 230 mm TL forming the mainstay of the fisheries in Maharashtra. Juveniles of both sexes showed identical growth rate and measured 85 mm TL in the first year, 145 mm TL in the

second year and 205 mm TL in the third year. Males demonstrated faster growth rate. Females attained 50% maturity at 175 mm TL. Peak breeding is in September. High exploitation ratio of 0.85 and 0.82 in males and females, respectively has resulted in recruitment overfishing in Mumbai waters (Radhakrishnan *et al*., 2007). Exported in whole-cooked frozen form.

Panulirus ornatus (Fabricius, 1798) [*Palinurus ornatus*]
English name: Ornate spiny lobster

Diagnosis: Abdominal somites smooth and naked; colour of abdomen brownish or greenish-grey with utmost minute indistinct speckles. The usually large eyespot in the anterior half near the base of the pleura is accompanied by an oblique pale streak placed somewhat median of the eyespot. Legs not streaked, but with very sharply defined irregular dark spots of bluish or brownish colour, which often form incomplete rings around the various segments. Antennal flagella distinctly ringed.



Range distribution: Tropical Indo-Pacific. It ranges from Natal in South Africa, along the coast of East Africa and the Red sea to southern Japan, the Solomon Islands, Papua New Guinea, Australia, New Caledonia and Fiji (Holthuis,1991). Forms fishery along the southeast coast of India.

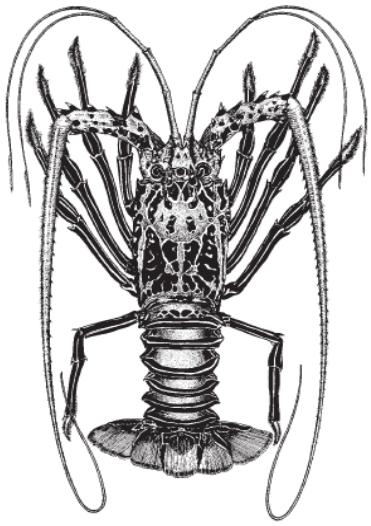
Habitat and ecology: In shallow, sometimes slightly turbid coastal waters; from 1 to 8m depth, with a few records from depths as great as 50m; on sandy and muddy substrates and sometimes

on rocky bottom often near the mouth of the rivers, but also on coral reefs. The species has been reported as solitary or as living in pairs, but has also been found in larger concentrations.

Biology: This is the largest of the *Panulirus* species and can attain a total body length of about 50cm, but usually is much smaller (25-30 cm).Mainly form fishery along the southeast coast of India. *P. ornatus* is caught both by trawlers and gillnets. *P. ornatus* forms major component of the trawler catch. *P. ornatus* appears throughout the year, but highest catch is in May at Tuticorin. The size of lobsters in the fishery ranges from 113 to 233mm TL in males and 128-452 mm TL in females with 41% falling in the size range of 181-190 mm TL, which are juveniles. At Tuticorin the inshore fishery for juvenile *P. ornatus* is detrimental to the stock. Occasionally found along the west coast of Kanyakumari district and form a small fishery at Tikkoti, Calicut. Occurrence of adult and egg bearing population at 40-60 m depth indicates that the species breeds probably at relatively deeper areas. This is a fast growing spiny lobster among the tropical species. Females mature at 90 mm CL. The fecundity in specimens caught along the Chennai coast (104.4mm to 145.1 mm CL) ranges from 5, 18,181 to 19, 79,522 eggs.

Panulirus versicolor (Latreille, 1804) [*Palinurus versicolor*]
English name: Painted spiny lobster

Diagnosis: Antennular plate with 4 strong spines arranged in a quadrangle. Carapace whitish with well-defined, sharply delimited area of bluish black; antennal peduncles pink; antennal flagella white; abdominal somites 2 to 5 with white transverse bands; legs with streaks of white lines.



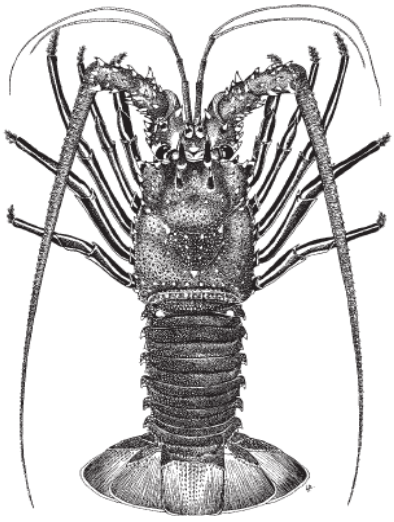
Range distribution: This species is known throughout the Indian ocean (east coast of Africa and the Red sea) east to Japan, Micronesia, Melanesia, Polynesia and northern Australia (Holthuis, 1991). Along the Indian coast the species has been reported from southeast, southwest, A&N Islands and Lakshadweep.

Habitat and ecology: This species is found in areas of coral reef, most often on the seaward edge of the reef plateau, where it utilizes the reef and rocks for shelter. It is found in shallow waters to a maximum depth of 15m (Holthuis, 1991). Furthermore, they are nocturnal and they only aggregate in very small numbers.

Biology: Fishery of lower magnitude reported along the Chennai, Mandapam and Trivandrum coasts. In A&N Islands, *P. versicolor* formed 26% of total landings (0.12 t) in 1999-2000 (Kumar *et al*., 2010). The fecundity of *P. versicolor* (66.0 to 95.0mm CL) from Chennai coast was estimated to range from 1, 70,212 to 7, 33,752.

Panulirus penicillatus (Olivier, 1791) [*Astacus penicillatus*]
English name: Pronghorn spiny lobster

Diagnosis: Body greenish or reddish, ranging from yellowish-green through brown-green to blue-black. Antennular plate with 4 strong spines which are fused at the base forming a single bunch of 4 diverging points, the anterior pair shorter than the posterior. Transverse grooves over the abdomen uninterrupted.



Range distribution: This species has the widest distribution of any of the spiny lobsters. It occurs in the Indo-west Pacific and East Pacific regions (Holthuis, 1991), South from the Red sea to South and East Africa; Madagascar and surrounding islands, through the Indian Ocean and

South China sea to Japan, the Philippines, Indonesia, Hawaii, Samoa, northern and eastern Australia and as far as east as the Islands of north west coast of US and Mexico. Along the Indian coast, the species is distributed along the southeast and south west coast, Lakshadweep as well as in A&N Islands.

Habitat and ecology: This nocturnal species commonly inhabits depths of 1 to 4m (maximum16m), on rocky substrates (Chan, 1988). It is often found in the outer reef slopes, subtidal zone or surge channels, and as such can occur on small islands or near arid coasts (Holthuis, 1991). In the Western Pacific, females seem to be reproductive all year round (Chan, 1998).

Biology: Little information is available on the biology of the species as there is only occasional capture of the species from Indian coast. The species has been successfully cultured in the laboratory (Nelson *et al*., 2006). There is little demand for the species in the live lobster export market.

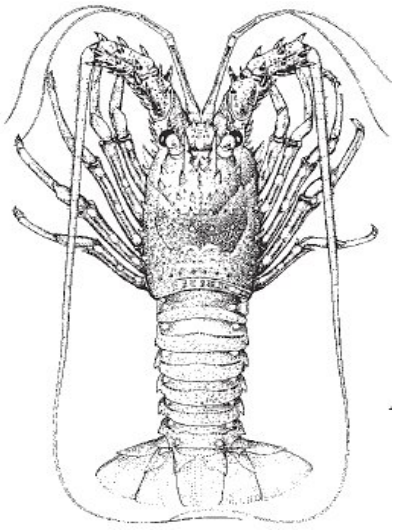
Panulirus longipes (A. Milne Edwards, 1868) [*Palinurus longipes*]

English name: Longlegged spiny lobster

This species is comprised of two subspecies *Panulirus longipes longipes* (A.Milne Edwards, 1868) and *P. longipes bispinosus* Borradaile, 1899. The species found along the Indian coast is *P. longipes longipes.*

P. longipes longipes *(*A. Milne Edwards, 1868*)*

Diagnosis: Body or especially the abdomen covered with numerous distinct round spots; legs with light longitudinal streaks; abdomen dark purple. No pubescent area on the abdominal somites behind the transverse groove; exopod of third maxilliped present.



Range distribution: Indo-west pacific; East Africa to Thailand, Taiwan, the Philippines, Indonesia and India. Along the Indian coast the species was reported from the southeast and south west coast and the A&N Islands.

Habitat and ecology: The species lives in clear or slightly turbid water at depths of 1-18 m (also reported from 122 m), in rocky area and coral reefs. The animals are nocturnal and not gregarious (Holthuis, 1991).

Biology: As this is not a commercial species and occasionally landed as single specimens, not much information is available on the biology of the species from Indian waters. Maximum total body length 30 cm, average length 20 to 25 cm. The smallest ovigerous female has a total length of 14 cm.

Genus ***Puerulus*** Ortmann, 1897

Four species have been recognized so far in this genus, all deepwater forms. *P.sewelli* forms a commercially important fishery along the south west and southeast coast of India.

Key to species (after Berry, 1969)

1.Two teeth between frontal horns and the cervical groove

1a. Median keel of carapace with 5 post-cervical and 2 or 3 intestinal teeth. Fifth pereiopod of male not chelate……*P. sewelli*

Puerulus sewelli Ramadan,1938

Diagnosis: Median keel of carapace with 5 post-cervical and 2 or 3 intestinal teeth. Fifth pereiopod of male not chelate.

Range distribution: Western Indian Ocean; Somalia, Gulf of Eden, off Pakistan, southwest (Quilon Bank, Mangalore) and southeast (off Mandapam and Tuticorin, Gulf of Mannar) of India, and A&N Islands.

Habitat and ecology: Known from depths between 180 and 300 m on a substrate of coarse sand hard mud and shells (Holthuis, 1991).

Biology: Maximum total body length 20 cm, maximum carapace length about 8 cm. Average total length about 15 cm. The species was commercially exploited along the southwest and southeast coast of India. A catch rate of 200-300 Kg/hr was reported from vessels operating off Mandapam. January to April is the peak period of abundance. During 1998-2000, 524 t were

landed at Sakthikulangara, Kollam, Kerala. The sizes of *P. sewelli* ranged from 76-80 mm to 176-180mm TL in males and from 81-85mm to 176-180 mm in females. 26% of females were found in mature/berried stage. Due to coincidence of peak breeding and the fishery, the breeding population has been heavily exploited. The species has been overexploited and the current landing is around 2 tonnes/annum from Quilon bank.

Genus ***Linuparus*** White, 1847

The genus *Linuparus* has three recent species and only one species is present in Indian waters.

Key to recent species

Submarginal posterior groove of carapace much wider medially than laterally; vestigial pleopods present on first abdominal segment of female…. *Linuparus somniosus*

Linuparus somniosus Berry and George, 1972

English Name: African spear lobster

Diagnosis: Submarginal posterior groove of carapace much wider medially than laterally; vestigial pleopods present on first abdominal segment of female.

Range distribution: Off the East coast of Africa from Kenya to Natal, South Africa, A& N Islands

Habitat and ecology: Depth range from 216 to 375 on rough substrate and mud.

Biology: Maximum total body length about 35 cm, carapace length 14 cm; average carapace length about 10 cm. For more information on the species from A&N Islands refer Ali *et al.,* 1991.

Genus ***Palinustus*** A. Milne Edwards, 1880

This genus is characterized by the shape of the frontal horns, that do not end in a sharp point but in a broad, bluntly truncated to that sometimes is crenulated; s strong spine is present on the outer margin of each horn.

Key to species

No median spine on anterior margin of carapace. Epistome with tubercles or spinules an anteromedian margin; anterolateral corner with a small spine or unarmed.

Anterior margin of carapace as well as inner margin of the frontal horns with several distinct spines; Shallow water form, 0 to 180 mm. Indo west Pacific region (India, Thailand, Philippines, Japan)…….*Palinustus waguiensis*

Palinustus waguiensis Kubo, 1963

English name: Japanese Blunthorn lobster

Diagnosis: Anterior margin of carapace as well as inner margin of the frontal horns with several distinct spines.

Range distribution: Holthuis (1991) opined that the species *P. mossambicus* described by George (1965) is believed to be *P. waguiensis*. The occurrence along the Indian coast was first reported from southwest coast. However, deep sea trawling along the southeast coast of India landed small quantities of the species at Chennai and bottom-set-gillnet at Cuddalore. Few numbers have also been reported from bottom-set-gillnets operated at 5-10 m along the Chennai coast.

Habitat and ecology: Reported from shallow waters in Japan and India. The species has also been caught from depths of 72 and 84 m in India and Philippines (Holthuis, 1991).

Biology: Total body length 5 to 10 cm. At Chennai, specimens from bottom-set-gillnets measured 48-70 mm CL.

Family : Scyllaridae Latreille, 1825

Key to identification of the family

Antennal flagellum reduced to a single, flat plate which forms the sixth and final segment of the antenna. The shovel-like appearance of the antennae is responsible for the name shovel-nosed lobster for the animals of this group……..**Scyllaridae**

The family scyllaridae includes 19 genera which are distributed in 4 subfamilies, Arctidinae Holthuis, 1985, Ibacinae Holthuis, 1985, Scyllarinae Latreille, 1825 and Theninae Holthuis, 1985 (Chan, 2010). A single species coming under the subfamily Theninae alone is of commercial importance along the Indian context. The subfamily Arctidinae contains two genera Arctides Holthuis, 1960 and Scyllarides Gill, 1898. Two species under the genus Scyllarides have been reported from Indian coast.

Subfamily **Arctidinae** Holthuis, 1985

Genus ***Scyllarides*** Gill, 1898

First abdominal somite without a transverse groove dorsally; carapace with postorbital spine. Abdominal somites with a distinct sculpturation on either side of the median line. 14 species have been so far reported from this genus.

Scyllarides elisabethae (Ortmann, 1894) [*Scyllarus elisabethae*]
English name: Cape Slipper lobster
Diagnosis: Lateral margin of carapace with distinct cervical and postcervical incisions. Anterior margin of the carapace between the eye and the antero-lateral angle evenly concave.
Range distribution: Indo-west Pacific region; Known from southeast Africa and Vizhinjam, Southwest coast of India.
Habitat and ecology: Depth range from 37 to 380m (mostly less than 100 m) on substrate of fine sediments mud or fine sand. The animals seem to dig into the mud.
Biology: A single female specimen measuring 120 mm CL, 330 mm TL and weight 740 g was caught off Vizhinjam coast from a depth of 50 m by trammel net.

Scyllarides tridacnophaga Holthuis, 1967
English name: Clamkiller slipper lobster
Diagnosis: Cervical groove narrow and shallow in its median area; the cardiac knob thereby little pronounced. Pregastric tooth distinctly two-topped. Median ridges on second to fourth abdominal somite sharp and distinctly set off from the rest of the surface. Central spot on first abdominal somite sharply defined, as distinct as the laterals.
Range distribution: Indo-west pacific region. Red sea, East Africa (Somalia, Kenya), Gulf of Aden, Pakistan, west coast of Thailand, south
Habitat and ecology: Depth range from 5 to 112 m; the species has been observed to open *Tridacna* shells.
Biology: Total body length upto 30 cm; carapace lengths reported vary between 6 and 12 cm.

Genus ***Parribacus*** Dana, 1852
Dorsal surface of the body coarsely squamose-tuberculate, without postrostral or branchial carinae. Distance between the orbits more than twice as long as the distance between each orbit and the anterolateral angle of the carapace. Fifth abdominal somite without posteromedian spine. Mandibular palp two-segmented.
The genus contains 6 species. One species occur in Indian waters.

Parribacus antarcticus (Lund, 1793) [*Scyllarus antarcticus*]
English name: Sculptured mitten lobster

Diagnosis: The transverse groove which separates the anterior from the posterior part of the abdominal somites and which in the fully stretched animal forms the anteriormost part of the visible portion of the somites is wide and naked bearing at most a few hairs and tubercles in the median area. The anterior part of the second to third abdominal somites, situated before the just-mentioned groove, bears distinct tubercles. The median carinae of the second and third abdominal somites are elevated. The lateral margin of the fourth segment of the antenna as a rule bears six teeth. The two lateral teeth before the cervical incision are of almost equal size.

Range distribution: Indo-west pacific region. Along the Indian coast recorded from Minicoy and Gulf of Mannar.

Habitat and ecology: taken at depths from 0 to 20 m. in coral or stone reefs with a sandy bottom. The species is nocturnal and in the daytime hides in crevices, sometimes in small groups.

Biology: There is no commercial fishery. Carapace lengths between 2 and 9 cm; maximum total length 20 cm. Tastes very good. It is sold as fresh or cooked.

Subfamily: **Scyllarinae** Latreille, 1825
There are 14 genera under this subfamily. More than 40 species are known. Most species are small and of no economic value. The family is represented by 5 genera in India.

Genus ***Biarctus*** Holthuis, 2002
Two species are reported from India. Earlier they were included in the genus *Scyllarus*.

B. sordidus (Stimpson, 1860) [*Arctus sordidus*]
Range distribution: Indo-Pacific; along the Indian coast reported from west coast.

Scyllarus tutiensis Srikrishnadhas, Rahman and Anandasekaran, 1991
The species name has been retained as such as its taxonomic identity is yet to be finalised.

Range distribution: Southeast coast of India (Tuticorin)

Genus ***Bathyarctus*** Holthuis, 2002
One species is known from Indian coast

B. rubens (Alcock and Anderson, 1894) [*Arctus rubens*]

Scyllarus rubens (Alcock and Anderson, 1894)[different generic combination]
Range distribution: West coast of India
Genus ***Petrarctus*** Holthuis, 2002

P. rugosus (H. Milne Edwards, 1837) [*Scyllarus rugosus*]
English name: Hunchback locust lobster
Range distribution: Indo-west pacific; reported from southeast coast of India (Chennai, Pondicherry)
Diagnosis: The carapace has the median teeth before the cervical groove blunt and inconspicuous; the rostral tooth is reduced to a tubercle; the gastric tooth is most conspicuous. The surface of the carapace is quite uneven and the tubercles are high. The abdomen shows a distinct median longitudinal carina on somites 2 b to 5, that of somite 3 is the highest; in each somite there is a wide transverse groove. The dorsal surface of the body is grayish or purplish brown with darker spots. The first abdominal somite shows dorsally often a dark blue colour.
Habitat and ecology: inhabits depths from 20 to 60 m.
Biology: Total body length reported is 2.5 to 6 cm.

Genus ***Eduarctus*** Holthuis, 2002

E. martensii (Pfeffer, 1881) [*Scyllarus martensii*]
English name: Striated locust lobster
Diagnosis: Carapace with two distinct teeth in the median line before the cervical groove, the rostral tooth is absent and replaced by an inconspicuous tubercle. The region between the postrostral and branchial carinae shows many tubercles; the abdomen has a conspicuously elevated longitudinal median carina on somites 2 to 5, that of somite 2 shows as an inverted v-shaped ridge when looked at dorsally; somite 1 shows a complete transverse groove behind which there are about 16 straight, parallel longitudinal unbranched grooves, which are quite characteristic for the species. The body is yellowish or reddish brown. A darker brown transverse band may be present on the third abdominal somite.
Range distribution: Indo-west Pacific; West and southeast coast of India
Habitat and ecology: The species has been found in depths between 6and 79m, mostly between 10 and 50 m. The substrate that it inhabits is smooth, sometimes with shells. The total body length is 2 to 4 cm.

Genus ***Scammarctus*** Holthuis, 2002

S. batei batei (Holthuis, 1946) [*Scyllarus batei*]
English name: Soft locust lobster

Diagnosis: Carapace with 2 distinct teeth in the median line before the cervical groove; the rostral tooth is absent. Abdomen with a distinct sharp median carina on somites 1 to 5. Somite 1 with the transverse groove interrupted in the middle by the median carina; The fourth segment of the antenna has a single, distinct oblique median carina; no median tubercles on the sternites; dactyl of legs 3 to 5 with dorsal fringes of hair; body pale brown with the ridges and tubercles pale purple or reddish; first abdominal somite brick red in the anteromedian area.

Range distribution: Indo-west pacific; southwest and southeast coast of India. Depth range from 160 to 484 m on sandy and muddy substrates

Biology: Maximum body length about 7 cm.

Subfamily: **Theninae** Holthuis, 1985

This monotypic family was recently revised by Burton and Davie (2007). There is only one genus *Thenus* in the subfamily. Five species has been identified using both morphology and molecular methods. The species so far described as *Thenus orientalis* from most part of Indian coast is *T. unimaculatus* (Radhakrishnan *et al.,* 2013*)*. *T. indicus* is also presumed to exist along the southeast coast of India (Jeena, 2013).

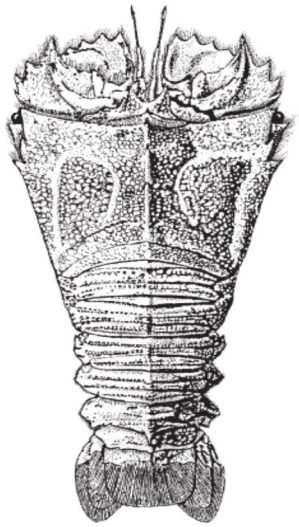
Genus: ***Thenus*** Leach, 1816

Diagnosis: Orbits on the anterolateral angle of the carapace. Body strongly depressed. Lateral margin of the carapace with only the cervical incision. No teeth on the lateral margin of the carapace, apart from the antero-lateral and postcervical. Fifth leg of female without a chela.

Thenus unimaculatus Burton & Davie, 2007
English name: Slipper lobster/Sand lobster

Diagnosis: Purple to black pigmentation blotch on inner surface of merus of second and sometimes third legs, usually large but variable in extent and may be reduced to a narrow streak; purple pigmentation occasionally surrounding eye socket on carapace; outer phase of propodus of P2 having upper-most longitudinal groove bearing obvious setae over atleast proximal half. Merus of third maxilliped with a small spine proximally on inner ventral margin; inner margin of ischium prominently dentate along the entire length. No single morphometric ratios that fall outside the following maximum and minimum values; carapace width (CM1) greater than 1.29

times carapace length (CL); length of propodus of pereiopod 1 (PL1) less than 0.23 times carapace length (CL); length of propodus of pereiopod 2 (PL2) greater than 0.39 times carapace length (CL); width of propodus of pereiopod 1 (PW1) greater than 0.35 times length (PL1).



Range distribution: Indo-west Pacific region. In India, the species is distributed along the northwest, southwest, southeast and the northeast coasts. Forms commercial fishery in Saurashtra region, Kollam and Chennai.

Habitat and ecology: Depth range from 8 to 70 m, usually between 10 and 50 m; on soft substrate, sand or mud.

Biology: Maximum total body length about 25 cm; often appears as bycatch in trawls; also caught in gillnets. At Kollam, Kerala peak fishery was observed from November to February. Total length varied between 61-230 mm in males and 46-250 mm in females. Length at recruitment (Lr) was 48mm. Absolute fecundity varied from 14750 to 33250 mature eggs (Radhakrishnan *et al*., 2013).

T. indicus Leach, 1816

Diagnosis: No spots on the pereiopods and telson; pereiopods slender; dorsal profile slightly concave; rostral processes sharp and directed anteriorly and upward; second anetennal segment has five teeth; third maxiliped with a spine on the merus and dentition on ischium; morphometric ratio ML3/CL -> 0.45; MW1/CL- < 0.07.

Range distribution: Indian Ocean; east coast of India

Habitat and ecology: Inhabitant of relatively shallow, inshore waters with muddy sediment; most abundant between 10 and 30 m.

Infraorder : Polychelida Scholtz & Richter,1995
Family: Polychelidae Wood-Mason, 1875
There are six genera under this family. No commercially important species. The family is represented by two species in India.

Genus ***Stereomastis*** Bate, 1888
Stereomastis phosphorus (Alcock, 1894) [*Pentacheles phosphorus*]
Polycheles phosphorus (Alcock, 1894) under different generic combination
Range distribution: Bay of Bengal, India

S. nana (Smith, 1884) [*Pentacheles nanus*]
Polycheles nanus (Smith, 1884) [different generic combination]
Polycheles anadamanensis (Alcock, 1894) [*Pentacheles andamanensis*]
Stereomastis andamanensis (Alcock, 1894) [*Pentacheles andamanensis*]
Stereomasts grimaldii (Bouvier, 1905) [*Polycheles grimaldii*]
Range distribution: A& N Islands

Infraorder :Astacidea Latreille, 1802
Superfamily: Enoplometopoidea Saint Laurent, 1988
Family: Enoplometopidae Saint Laurent, 1988
Genus: ***Enoplometopus*** A. Milne Edwards, 1862
There are twelve species; two species known from Indian coast

E. occidentalis (Randall, 1840) [*Nephrops occidentalis*]
English name: Hawaiian Reef lobster
Range distribution: Hawaii. Mandapam, Gulf of Mannar, southeast coast of India (Radhakrishnan and Jayasankar- in press)

E. macrodontus Chan & Ng, 2008
Range distribution: Philippines, Ponnani (South west coast of India) (Radhakrishnan *et al*., 2012)
Superfamily: Nephropoidea Dana, 1852
Family: Nephropidae Dana, 1851 [Nephropinae]
There are 14 genera under this family. This family is represented by two genera along the Indian coast.

Genus ***Acanthacaris*** Bate, 1888
Only one species is known from Indian waters.
A. tenuimana Bate, 1888

English name: Prickly deep sea lobster

Diagnosis: A rather large lobster. Body cylindrical, completely covered with small spines and sharp tubercles; carapace with a well developed median rostrum which is laterally compressed with dorsal and ventral, but no lateral teeth. Eyes very small, lacking pigment; antennae long and whip-like; antennal scales well developed. Tail powerful, with a well developed tail fan. First three pairs of pereiopods ending in true chelae. The first pair equal, very slender, longer than the body, covered with sharp spinules and ending in elongate and slender fingers with long teeth on cutting edges, but without hairs. Fingers of first cheliped 1.5 to twice as long as palm. Second pair of pereiopods very much longer and less spiny than third pair.

Range distribution: Lakshadweep islands, India

Genus ***Nephropsis*** Wood-Mason, 1871

Five species reported from Indian waters.

N. carpenteri Wood- Mason, 1885

English name: Ridgeback lobsterette

Range distribution: Bay of Bengal

N. stewarti Wood-Mason, 1872

English name: Indian Ocean lobsterette

Range distribution: Indo-West Pacific from Eastern Africa to Japan, the Philippines, Indonesia and Northwestern Australia from 170 to 1,060 m depth (Chan, 1998). Southwest coast (Mangalore, Cochin), southeast coast of India (Chennai), A& N Islands (Ross Island)

Habitat and ecology: Depth 250-500 m; Forms small scale fishery at Mangalore. During 2000-2006, the average annual landing of the species was estimated at 23.3 t with the highest landing in 2001 (51 t) and the lowest in 2005 (9 t).

Biology: Fishery was constituted by the length range 58-158 mm. Females < 80 mm (total length) were found to be immature. Highest percentage (33% of immature females was found during November.

N. sulcata MacPherson, 1990

English name: Grooved lobsterette

Range distribution: Indo-Pacific; Southwest coast of India

N. ensirostris Alcock, 1901

English name: Gladiator lobsterette

Range distribution: North of Lakshadweep, Arabian sea

N. suhmi Bate,1888

English name: Red & White lobsterette

Range distribution: Aru Islands, Indonesia, West coast of India

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