

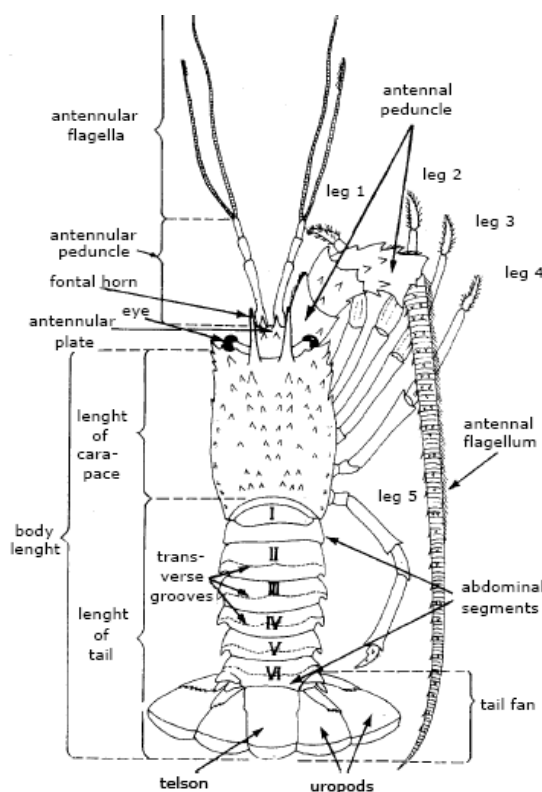
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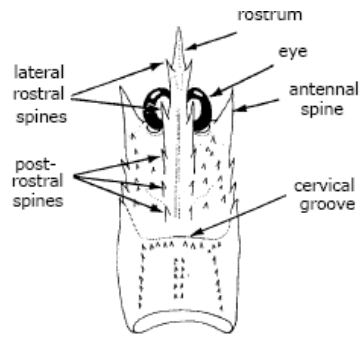
Taxonomy, Biology and Distribution of Lobsters

Dr. Rekha Devi Chakraborty

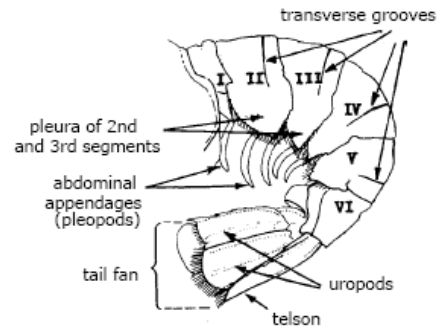
Crustacean Fisheries Division

Lobsters are among the most prized of fisheries resources and of significant commercial interest in many countries. Because of their high value and esteemed culinary worth, much attention has been paid to lobsters in biological, fisheries, and systematic literature. They have a great demand in the domestic market as a delicacy and is a foreign exchange earner for the country.





carapace (dorsal view) of a lobsterette (*Metanephrops* sp.)



tail (abdomen) in lateral view

Taxonomic status

Phylum: Arthropoda

Subphylum: Crustacea

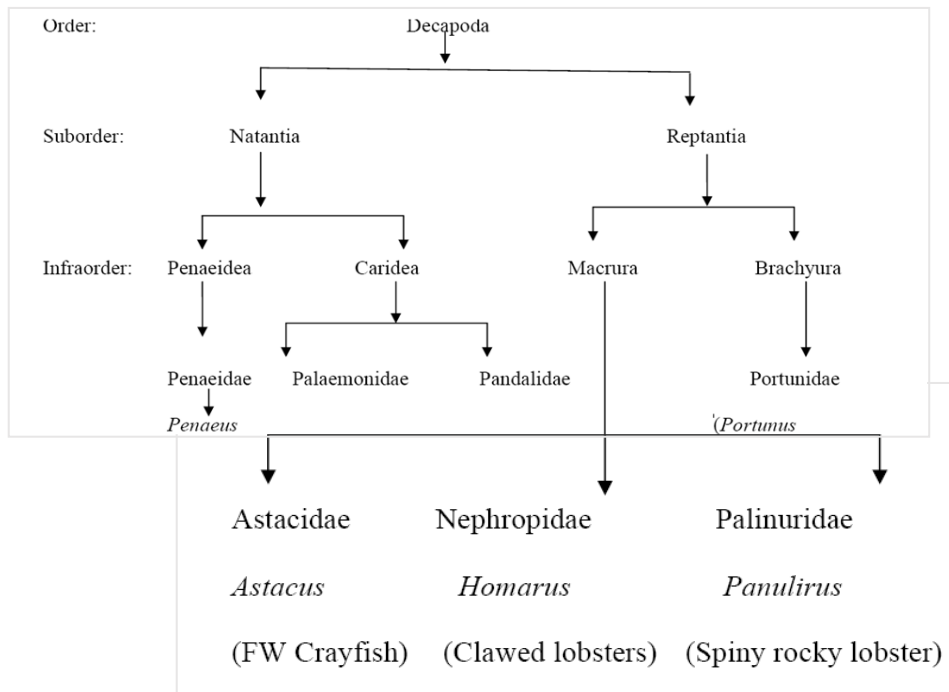
Class: Malacostraca

Subclass: Eumalacostraca

Superorder: Eucarida

Order: Decapoda

Suborder: Macrura Reptantia



The suborder Macrura Reptantia consists of three infraorders: Astacidea (Marine lobsters and freshwater crayfishes), Palinuridea (Spiny lobsters and slipper lobsters) and Thalassinidea (Mud lobsters). The infraorder Astacidea contains three superfamilies of

which only one (Nephropoidea) is considered here. The remaining two superfamilies (Astacoidea and Parastacoidea) contain the freshwater crayfishes. The superfamily Nephropoidea (40 species) consists almost entirely of commercial or potentially commercial species.

The infraorder Palinuridea also contains three superfamilies (Eryonoidea, Glypheoidea and Palinuroidea) all of which are in marine. The Eryonoidea are deepwater species of insignificant commercial interest. The Glypheoidea includes an almost exclusively fossil group. About 120 species are included in the superfamily Palinuroidea.

Third infraorder, Thalassinidea, contains a single superfamily, Thalassinidea which contains around 100 species. Only few representatives of this superfamily are known to be used as food and bait.

Key to the three Infraorders and their Superfamilies

1a. First three pairs of pereiopods with true chelae, the first pair the largest and most robust

2a Fourth pereiopod, and usually also the fifth, without true chelae. Carapace cylindrical not flattened.....Infraorder **Astacidea**, Superfamily **Nephropoidea**

2b All pereiopods, or at least the first four, with true chelae. Carapace flattened. Deep-sea species.....Infraorder **Palinuridea**, Superfamily **Eryonoidea**, Family **Polychelidae**

1b. Third pereiopod never with a true chela, in most groups chelae also absent from first and second pereiopods

3a Antennal flagellum reduced to a single broad and flat segment, similar to the other antennal segments.....Infraorder **Palinuridea**, Superfamily **Palinuroidea**, Family **Scyllaridae**

3b Antennal flagellum long, multi-articulate, flexible, whip-like, or more rigid

4a Epistome long, about 1/3 of carapace length. Eyes on a median elevation of the cephaloninfraorder **Palinuridea**, Superfamily **Glypheoidea**, Family **Glypheidae**

4b Epistome short, far shorter than 1/3 of the carapace. Eyes not placed on an elevation of the cephalon

- 5a Carapace with numerous strong and less strong spines and two frontal horns over the eyes. Rostrum absent or reduced to a single spine. Legs 2 to 4 without chelae or sub chelaeInfraorder **Palinuridea**, Superfamily **Palinuroidea**, Family **Palinuridae**
- 5b Carapace with at most a few spines; no frontal horns. Rostrum present, even though sometimes small. Legs 1 and 1 simple, chelate or subchelate
- 6a First pereopods simple, rostrum flat, broad and triangular or broadly oval.....Infraorder **Palinuridea**, Superfamily **Palinuroidea**, Family **Synaxidae**
- 6b First pereopod chelate or subchelate. Rostrum of diverse shapes.....Infraorder **Thalassinidea**

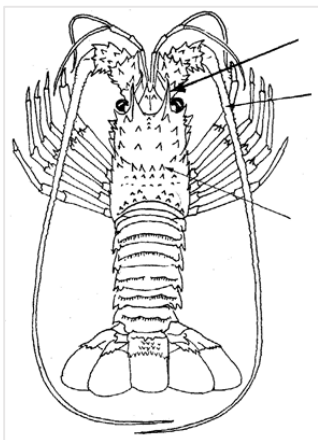
Superfamily Palinuroidea (Latreille, 1802)

Three families make up this superfamily, namely the Palinuridae (Spiny lobsters), Synaxidae (Furry lobsters) and Scyllaridae (Slipper lobsters).

Key to families

1a. 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 names shovel-nose lobster and bulldozer lobster also used for the animals of this group**Scyllaridae**

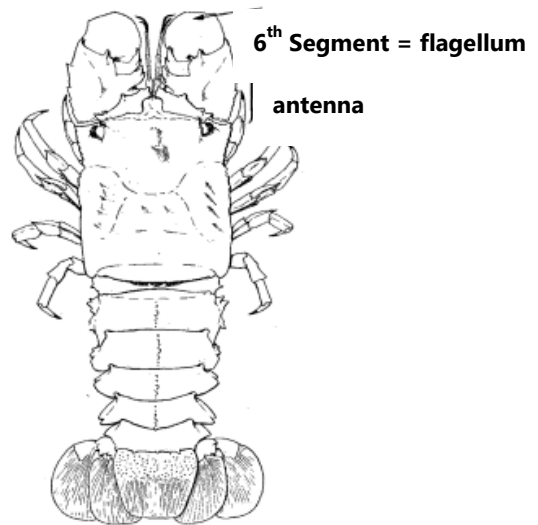
1b. Antennal flagellum long and consisting of numerous small articles, whip-like or spear-like



Frontal horns

Antennal

Spines on carapace



Family: Palinuridae (Latreille, 1802)

Antennal flagellum long and consisting of numerous small articles, whip-like or spear-like. Rostrum absent or visible as a small 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**

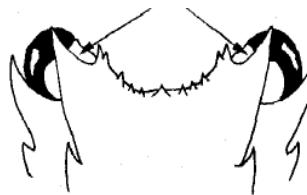
There are 11 genera in this family *Justitia*, *Jasus*, ***Linuparus***, *Nupalirus*, *Palibythus*, *Palinurus*. ***Palinustus***, ***Panulirus***, *Projasus*, ***Puerulus***, *Sagmariasus*, (those in bold letters are represented in India)

Key to genera occurring in the family Palinuridae

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***

Genus *Panulirus* (White, 1847)

Anterior margin of carapace between frontal horns with about 10 small, sharp teeth; pleura of second to fifth abdominal somites with a strong anterior tooth followed by a lobe denticulated on the posterior margin

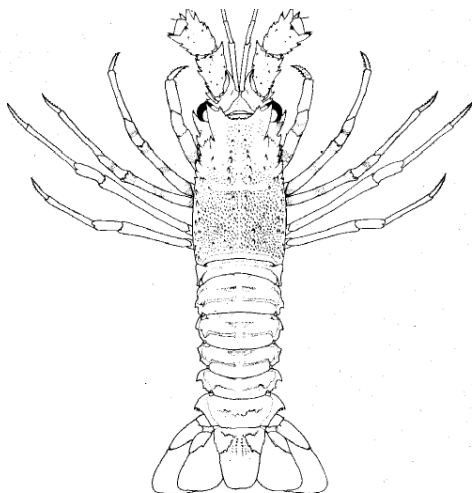


a. anterior part of carapace



tooth denticulated margin

.....***Panulirus***



George and Main (1967) recognized 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. Tooth-like frontal horns; antennal flagella quite flexible; flagella of antennules long, whip-like, longer than peduncle of antennules; antennular plate and stridulating organ present.

The species found in Indian waters are *Panulirus homarus*, *P. polyphagus*, *P. ornatus*, *P. versicolor*, *P. penicillatus*, and *P. longipes longipes*.

There are three subspecies: *Panulirus homarus homarus* (Linnaeus, 1758), *P. homarus rubellus* (Berry, 1974) and *P. homarus megasculpta* (Pesta, 1915).

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

1. Abdominal segment 2-5 with the 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***
3. 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***
4. Antennular plate (between the stridulating organs) with 2 pairs (4) of subequal principle spines, fused at their bases. Supraorbital horns rounded in cross section. Overall colour olive-black.....***P. pencillatus***
Antennular plate with 1 pair (2) of equal principle 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 bands on each abdominal segment. Legs with white spots, colour olive green.....***P. polyphagus***
5. Conspicuous transverse white band posteriorly on each abdominal segment. Legs with longitudinal white stripes, juveniles have white antennae. Overall colour black and green.....***P. versicolor***
No transverse white band on abdominal segments but above each pleural spur is a conspicuous white spots. Legs with irregular transverse mottling, no longitudinal stripes. Overall colour bluish green.....***P. ornatus***

***Panulirus homarus homarus* (Linnaeus, 1758)**

Diagnosis: Abdominal segments 2-5 with transverse grooves interrupted in the middle; minute squamae on the upper margin of the groove; antennular plate with four spines; exopod of third maxilliped absent; second maxilliped with no flagellum; olive green in specimens with minute squamae.

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 (Holthius, 1991). Northwest, southwest, southeast coast of India, Andaman & Nicobar Islands and Lakshadweep Islands. Forms fishery along southwest and southeast coast; promising species for aquaculture.



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

Biology: Maximum total length 31cm, 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)

Diagnosis: Abdominal somites smooth, without transverse groove. Surface of abdominal somites naked and smooth. Exopod of third maxilliped absent; second maxilliped with flagellum present; antennular plate with two strong spines; white transverse bands on the abdomen.



Distribution: This species has abroad range from Pakistan and India to Vietnam, the phillippines, Indonesia, northwest Australia and the Gulf of Papua (Holthius, 1991). In India 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. Exported

in whole-cooked frozen form; promising species for aquaculture.

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

Biology: The size in the fishery ranged from 75mm to 385mm total length (TL), those between 160mm and 230mm 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, 145mm TL in the second year and 205mm TL in the third year. Males demonstrated faster growth rate. Females attained 50% maturity at 175mm 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)

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.

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 island, Papua New Guinea, Australia, New Caledonia and Fiji (Holthius, 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 rivers, but also on coral reefs. The species has been reported as solitary or as a 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 (25-30cm). Mainly form fishery along the southeast coast of India. *P. ornatus* 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 128-452mm TL in females with 41% falling in the size range of 181-190mm TL, which are juveniles. At Tuticorin the inshore fishery for juveniles *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 40-60m depth indicated that the species breed probably at relatively deeper areas. This is a fast growing spiny lobster among the tropical species. Females mature at 90mm CL. The Fecundity in specimens caught along the Chennai coast (104.4 to 145.1mm CL) ranges from 5,18,181 to 19,79,522 eggs.

Panulirus versicolor (Latreille, 1804)

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.

Distribution: This species known throughout Indian ocean (east coast of Africa and the Red sea) east to Japan, Micronesia, Melanesia, Polynesia, and northern Australia (Holthius, 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 (Holthius, 1991). Furthermore, they are nocturnal and they only aggregate in very small numbers.

Biology: Fishery of lower magnitude reported along the Chennai, Mandapam, Trivandrum coasts. In A & N Islands, *P. versicolor* formed 26% of total landings (0.12t) in 1999 (Kumar *et al.*, 2010). The fecundity of *P. versicolor* (66.0 to 95mm CL) from Chennai coast was estimated to range from 1.70 to 7.34 lakhs.

Panulirus penicillatus (Olivier, 1791)

Diagnosis: 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.

Distribution: This species has the widest distribution of any of the spiny lobsters. It occurs in Indo-west Pacific and East Pacific regions (Holthius, 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 southwest coast. Lakshadweep as well as in Andaman & Nicobar Islands.

Habitat and ecology: This nocturnal species commonly inhabits at depth of 1 to 4m (Maximum 16m), 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 coast (Holthius, 1991). In the Western Pacific, females seem to be reproductive all year round (Chan, 1988).

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)

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.



Distribution: Indo-west pacific, East Africa to Thailand, Taiwan, the Phillipines, Indonesia and India. Along the Indian coast the species was reported from the southeast and southwest coast and A & N Island.

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

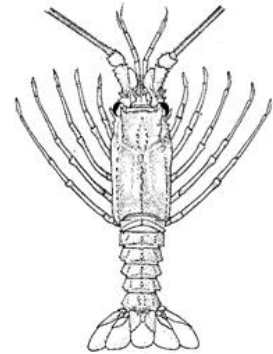
Biology: As this is not a commercial species and occasionally landed as single specimens, not much information is available on the biology of the species from Indian



waters. Maximum total body length 30cm, average length 20 to 25cm. The smallest ovigerous female has a total length of 14cm

Genus *Puerulus* (Ortmann, 1897)

Antennular plate distinct, a stridulating organ present. Carapace with a median ridge behind the cervical groove, often with spines or tubercles, but without submedian rows ***Puerulus***



Pleura of 3rd and 4th abdominal somites

Stridulating organ

Frontal horns



Anterior part of carapace

Antennular plate



Two teeth

Four species have been recognized so far in this genus, all deep waters forms *P. sewelli* forms a commercially important fishery along the southwest 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 pereopod 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 pereopod of male not chelate.

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 depth between 180 and 300 m on a substrate of coarse sand hard mud and shells (Holthius, 1991).

Biology: Maximum total body length 20cm, maximum carapace length about 8 cm. Average total length about 15cm. 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 opening off Mandapam. January to April is the peak period of abundance. During 1998-2000, 524t were landed at Sakthikulangara, Kollam, and Kerala. The sizes of *P. sewelli* ranged from 76-80mm to 176-180 TL in Males and from 81-85mm

to 176-180mm 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.

A large single median tooth before the cervical groove. Apart from two submedian and two lateral longitudinal rows of spines the posterior half of the carapace is smooth and without spinules. Abdominal pleura ending in two single sharp teeth ***Projasus***

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; a strong spine is present on the outer margin of each horn.

Four species have been described of this genus, none has any commercial value as all species seem to be very scarce and all occur at considerable depths. The taxonomic status of some of the species is not yet clear.

From the data in the literature it seems most likely that almost all the specimens, other than the type material, that have been identified as ***Palinustus mossambicus*** do not belong to that species but must be assigned to ***Palinustus waguensis***.

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 and of peduncle of antennules..... ***Palinustus***

Key to species

1a. Anterior margin of carapace between the frontal horns convex, with a single median spine; no other spines on this margin, but a single, small denticle on the inner margin of

each horn. Epistome with 5 to 7 spines on the anterior margin, and small spines in the anterolateral corner (Natal, South Africa) ***P. unicornutus***

1b. Anterior margin of carapace between the frontal horns straight or convex, with two or more spines. Epistome with spinules or tubercles on the anterior margin; anterolateral corners with a single spine or unarmed.

2a. A strong median spine, in addition to several others, on the anterior margin of the carapace between the frontal horns. Inner margin of the horns without spines. Epistome with 5 tubercles on the anteromedian margin; anterolateral corner with a strong spine. Western Atlantic ***P. truncates***

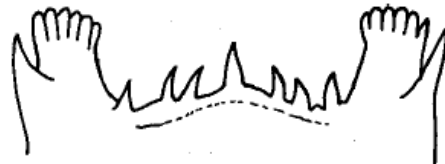
2b. No median spine on anterior margin of carapace. Epistome with tubercles or spinules on anteromedian margin; anterolateral corner with a small spine or unarmed. Indo-West Pacific.

3a. Anterior margin of carapace between frontal horns with a single pair of strong submedian spines; rest of the margin as well as the inner margin of the horns unarmed or with 2 very small spinules. Deep sea (406 m), but also reported from 59 to 61 m. East Africa (Somalia, Mozambique)..... ***P. mossambicus***

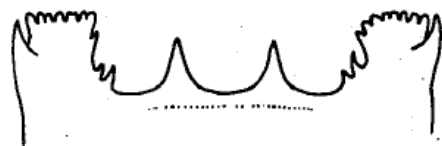
3b. Anterior margin of carapace as well as inner margin of the frontal horns with several distinct spines. Shallow water form, 0 to 180 m. Indo-West Pacific region (India, Thailand, Philippines, Japan)***P. waguensis***



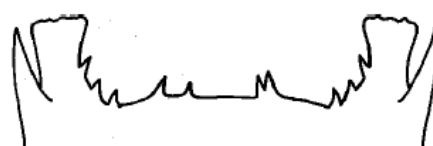
P. unicornutus



P. truncates



P. mossambicus



P. waguensis

Anterior margin of carapace (dorsal view)

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 greater part of the lobsters seem to be omnivores and scavengers, but few detailed observations are available on feeding habits. Some species are attracted by dead fish put as bait in lobster traps, but others are hardly ever caught in such traps. The Thalassinidea are mostly detritus feeders. Some lobsters also eat live animals; e.g. *Scyllarides tridacnophaga* has been observed to attack, open and eat specimens of the giant clam *Tridacna*.



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 Indian coast. 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)

Scyllarides elisabethae (Ortmann, 1894)

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.

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 120mm CL, 330mm TL and weight 740g was caught off Vizhinjam coast from a depth of 50m by trammel net.

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)**

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

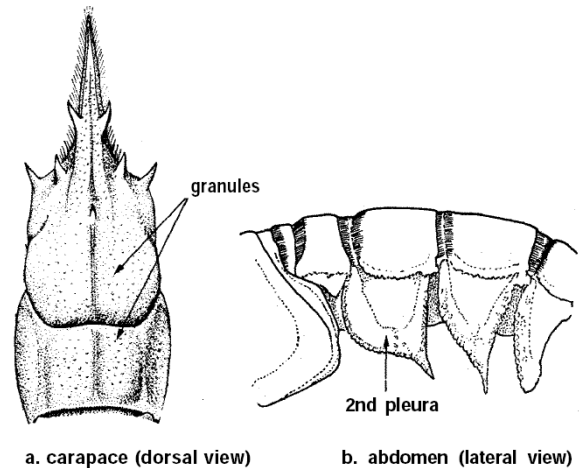
Distribution: Indo-west Pacific region. In India, the species is distributed along the northwest, southwest, southeast and the northeast coasts. Forms commercially fishery in Saurashtra region, Kollam and Chennai.

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

Biology: Maximum total body length about 25cm; often appears as bycatch in trawl; also caught in gillnets. At Kollam, Kerala peak fishery was observed from November to February. Total length varied between 61-230mm 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).

3a Eye not pigmented. Body granular and hairy, but not covered with evenly placed large pearly tubercles. Pleura of second abdominal somite ending in a long sharp point ***Nephropsis***

3b. Eye with pigmented, although small, cornea. Body entirely covered by conspicuous rounded pearly tubercles. Pleura of second abdominal somite broadly trapezoid, distal margin obliquely truncate, ending in a blunt posterior tooth ***Nephropides***



Genus *Nephropsis* (Wood-Mason, 1872)

Five species reported from Indian waters.

***N. carpenteri* (Wood-Mason, 1885);** English name: Ridgeback lobsterette

Distribution range: 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 23.3t with the highest landing in 2001 (51t) and the lowest in 2005 (9 t).

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

***N. sulcate* (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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