



THE LIVING MARINE RESOURCES OF THE  
**WESTERN CENTRAL  
PACIFIC**



Volume 2. Cephalopods, crustaceans, holothurians and sharks



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FAO SPECIES IDENTIFICATION GUIDE FOR FISHERY PURPOSES

THE LIVING MARINE RESOURCES OF THE  
**WESTERN CENTRAL PACIFIC**

VOLUME 2

**Cephalopods, crustaceans, holothurians and sharks**

edited by

**Kent E. Carpenter**

Department of Biological Sciences  
Old Dominion University  
Norfolk, Virginia, USA

and

**Volker H. Niem**

Marine Resources Service  
Species Identification and Data Programme  
FAO Fisheries Department

with the support of the

South Pacific Forum Fisheries Agency (FFA)

and the

Norwegian Agency for International Development (NORAD)

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#### **SUMMARY**

This multivolume field guide covers the species of interest to fisheries of the major marine resource groups exploited in the Western Central Pacific. The area of coverage includes FAO Fishing Area 71 and the southwestern portion of Fishing Area 77 corresponding to the South Pacific Commission mandate area. The marine resource groups included are seaweeds, corals, bivalves, gastropods, cephalopods, stomatopods, shrimps, lobsters, crabs, holothurians, sharks, batoid fishes, chimaeras, bony fishes, estuarine crocodiles, sea turtles, sea snakes, and marine mammals. The introductory chapter outlines the environmental, ecological, and biogeographical factors influencing the marine biota, and the basic components of the fisheries in the Western Central Pacific. Within the field guide, the sections on the resource groups are arranged phylogenetically according to higher taxonomic levels such as class, order, and family. Each resource group is introduced by general remarks on the group, an illustrated section on technical terms and measurements, and a key or guide to orders or families. Each family generally has an account summarizing family diagnostic characters, biological and fisheries information, notes on similar families occurring in the area, a key to species, a checklist of species, and a short list of relevant literature. Families that are less important to fisheries include an abbreviated family account and no detailed species information. Species in the important families are treated in detail (arranged alphabetically by genus and species) and include the species name, frequent synonyms and names of similar species, an illustration, FAO common name(s), diagnostic characters, biology and fisheries information, notes on geographical distribution, and a distribution map. For less important species, abbreviated accounts are used. Generally, this includes the species name, FAO common name(s), an illustration, a distribution map, and notes on biology, fisheries, and distribution. Each volume concludes with its own index of scientific and common names.

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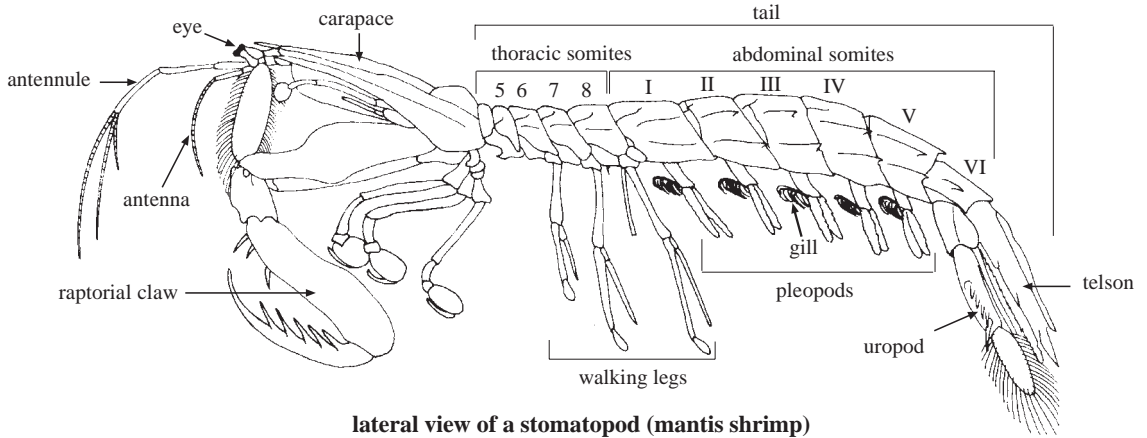
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# STOMATOPODS

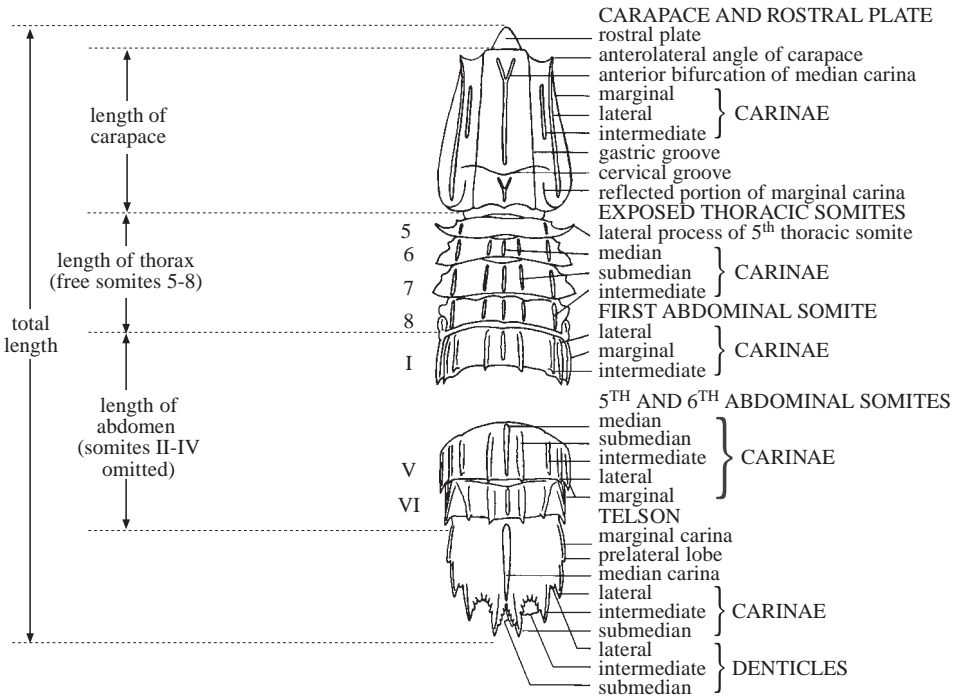
by R.B. Manning



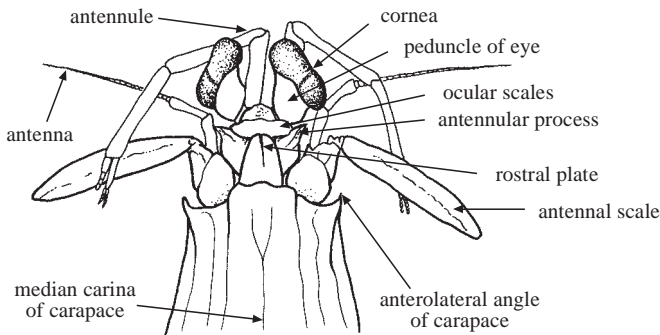
### TECHNICAL TERMS AND MEASUREMENTS



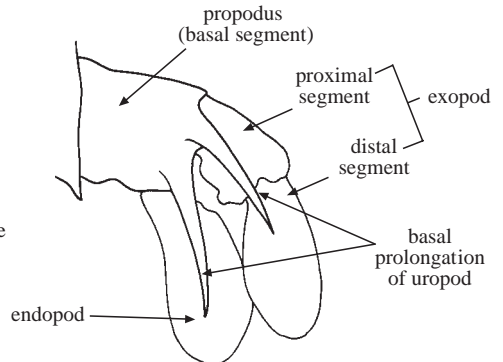
**lateral view of a stomatopod (mantis shrimp)**



**dorsal view (without head and extremities)**



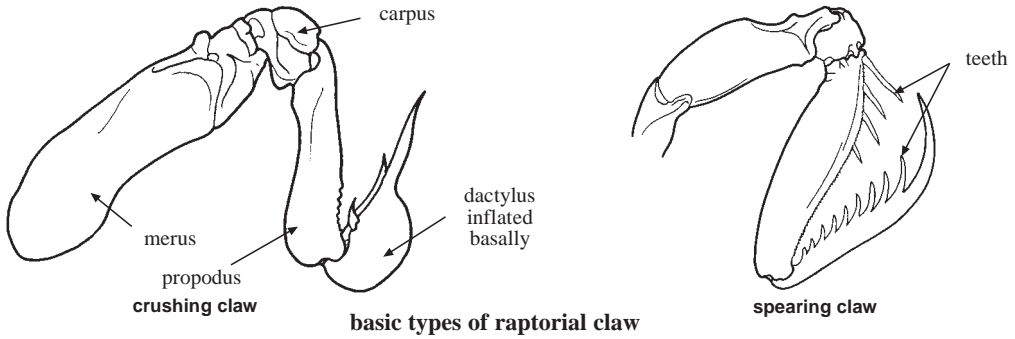
**anterior part of body (dorsal view)**



**left uropod (ventral view)**

**GENERAL REMARKS**

**S**tomatopods, also called mantis shrimps, are elongate, flattened, shrimp-like or lobster-like crustaceans, which are characterized by the following features: large, often T-shaped, movable eyes, often with a bilobed cornea; **a very short carapace, not more than about 1/3 the total length and not covering the eyes; only 3 pairs of walking legs; 5 pairs of pleopods under the anterior 5 abdominal somites (I to V); a long, flattened tail (which includes part of the thorax, the abdomen, and the terminal telson); 1 pair of lateral uropods on the abdominal somite VI which includes a strongly spined ventral process; a telson that is often spined posteriorly.** The most conspicuous characteristic of mantis shrimps is a pair of **massive, conspicuous, praying mantis-like “raptorial” claws** which are folded under the sides of the carapace. In many of the larger stomatopods, the terminal 2 segments of the claws usually are lined with sharp, serrated teeth. The claws are adapted for crushing or spearing. Those species with crushing claws have the terminal segment of the claw broadened and heavily buttressed basally. Spearing claws are more elongate, more conspicuously toothed, and much more slender, not inflated basally.



These are burrowing animals that hunt from the burrow or leave it to forage for food. Few, if any, mantis shrimps are fished commercially in the Western Central Pacific. However, very large, up to 38 cm long, representatives of 4 families can be found in markets or may be fished artisanally. They are often caught in trawls and fish traps, at night lights, and by hand.

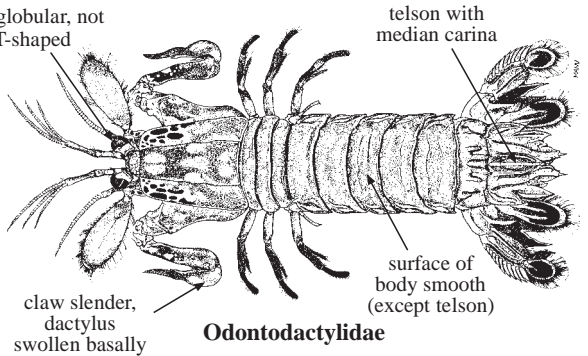
**GUIDE TO FAMILIES OF INTEREST TO FISHERIES OCCURRING IN THE AREA**

**ODONTODACTYLIDAE**

eye globular, not T-shaped  
 Page 832

**Odontodactylid mantis shrimps**

Body smooth, lacking longitudinal ridges or carinae anterior to terminal abdominal somite (= telson); telson with distinct median longitudinal carina; eyes subglobular, cornea not bilobed; raptorial claw short, with dactylus heavily buttressed, swollen basally. Four species of *Odontodactylus* occur in the area, only 1 of which, *O. scyllarus*, is large and common enough to occasionally be found in markets.

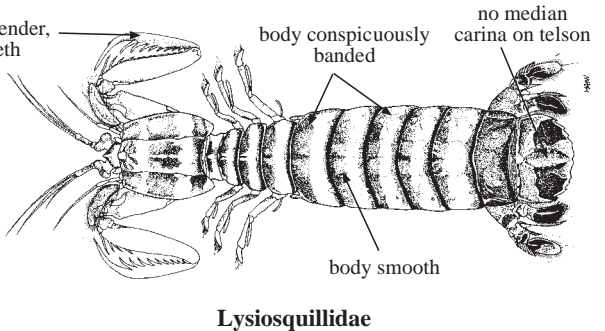


**LYSIOSQUILLIDAE**

claw large and slender, with many teeth  
 Page 835

**Banded mantis shrimps**

Body smooth, lacking longitudinal ridges or carinae; telson without median carina; eyes T-shaped, with large, bilobed cornea; raptorial claw large and slender. Four species found in the area, 2 of *Lysiosquilla* and 2 of *Lysiosquillina*, only 1 of which, *Lysiosquillina maculata*, is known to be fished, at least artisanally.

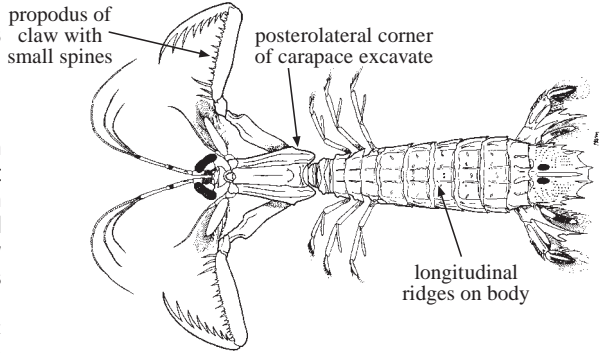


**HARPIOSQUILLIDAE**

Page 838

**Harpiosquillid mantis shrimps**

Body with longitudinal carinae or ridges; posterolateral angles of carapace with conspicuous excavation; telson with distinct median longitudinal carina; eyes T-shaped, with large bilobed cornea; raptorial claw large and slender; opposable margin of propodus of claw with erect spines. The larger, more conspicuous harpiosquillids belong to a single genus, *Harpiosquilla*. Nine species of *Harpiosquilla* found in the area, 2 of which are common enough to be found in markets.



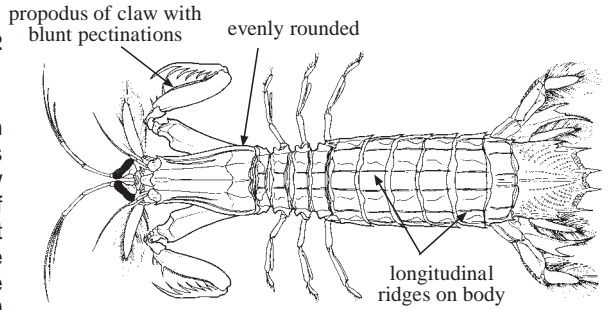
**Harpiosquillidae**

**SQUILLIDAE**

Page 842

**Squillid mantis shrimps**

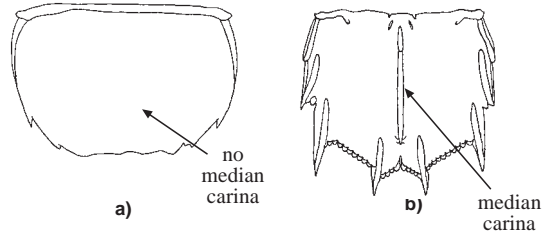
Body with longitudinal carinae or ridges; telson with distinct median longitudinal carina; eyes T-shaped, with bilobed cornea; raptorial claw large and slender; opposable margin of propodus of claw lined with low, blunt pectinations; posterolateral angles of carapace rounded, convex, rather than excavate. The family Squillidae comprises some 40 genera, 20 of which are represented in the Indo-West Pacific, but members of only 5 genera are large enough or abundant enough to be used for food.



**Squillidae**

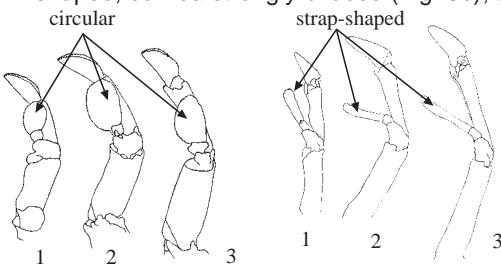
**KEY TO MAJOR FAMILIES OF STOMATOPODS OCCURRING IN THE AREA**

- 1a. Telson without median carina (Fig. 1a). . . . . → 2
- 1b. Telson with distinct median carina (Fig. 1b). . . . . → 3



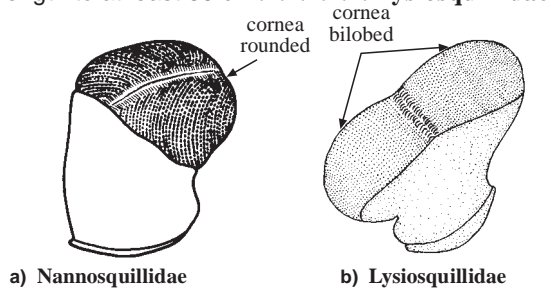
**Fig. 1 telson (dorsal view)**

- 2a. Distal segment of endopod of walking legs circular or nearly so (Fig. 2a); eyes not T-shaped, with cornea rounded or oval, not bilobed (Fig. 3a); total length not exceeding 7 cm. . . . . **Nannosquillidae**



**Fig. 2 walking legs 1-3**

- 2b. Distal segment of endopod of walking legs strap-shaped, elongate (Fig. 2b); eyes T-shaped, cornea strongly bilobed (Fig. 3b); total length to at least 30 cm. . . . . **Lysiosquillidae**



**Fig. 3 eye**

- 3a. Dactylus of raptorial claw inflated basally, strongly buttressed (Fig. 4a, b). . . . . → 4
- 3b. Dactylus of raptorial claw slender, not inflated or buttressed basally (Fig. 4c, d). . . . . → 5

- 4a. Dactylus of raptorial claw with teeth on inner margin (Fig. 4a); total length up to 17 cm  
 ..... **Odontodactylidae**
- 4b. Dactylus of raptorial claw unarmed on inner margin (Fig. 4b); total length less than 10  
 to 11 cm ..... **Gonodactylidae**

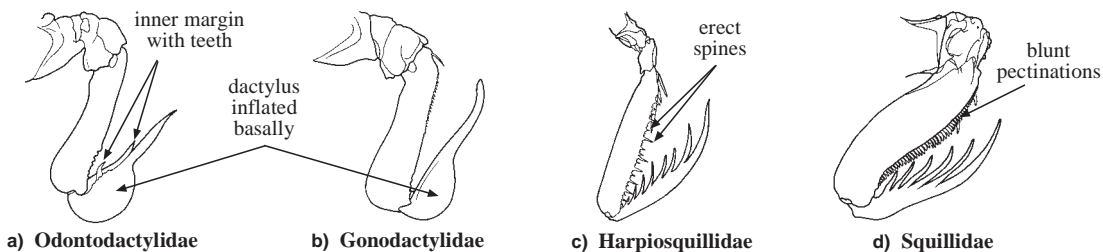


Fig. 4 right claw

- 5a. Carapace with posterolateral excavation (Fig. 5a); propodus of raptorial claw lined with erect spines (Fig. 4c) ..... **Harpiosquillidae**
- 5b. Carapace rounded posterolaterally, not excavate (Fig. 5b); propodus of raptorial claw lined with blunt pectinations (Fig. 4d). . . **Squillidae**

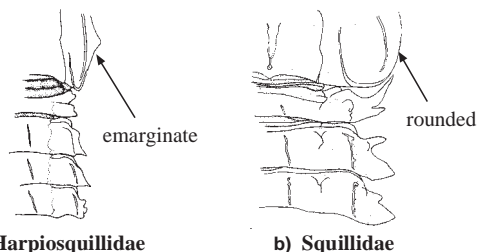


Fig. 5 posterolateral carapace and lateral processes of thoracic somites (dorsal view)

**LIST OF FAMILIES OCCURRING IN THE AREA**

The symbol is given for those families which are treated further in this contribution.

**Superfamily BATHYSQUILLOIDEA** Manning, 1967

- BATHYSQUILLIDAE Manning, 1967
- INDOSQUILLIDAE Manning, 1995

**Superfamily ERYTHROSQUILLOIDEA** Manning and Bruce, 1984

- ERYTHROSQUILLIDAE Manning and Bruce, 1984

**Superfamily GONODACTYLOIDEA** Giesbrecht, 1910

- ALAINOSQUILLIDAE Moosa, 1991
- EURYSQUILLIDAE Manning, 1977
- GONODACTYLIDAE Giesbrecht, 1910
- HEMISQUILLIDAE Manning, 1980
- ODONTODACTYLIDAE Manning, 1980
- PARASQUILLIDAE Manning, 1995
- PROTOSQUILLIDAE Manning, 1980
- PSEUDOSQUILLIDAE Manning, 1977
- TAKUIDAE Manning, 1995

**Superfamily LYSIOSQUILLOIDEA** Giesbrecht, 1910

- CORONIDAE Manning, 1980
- HETEROSQUILLIDAE Manning, 1995
- LYSIOSQUILLIDAE Giesbrecht, 1910
- NANNOSQUILLIDAE Manning, 1980
- TETRASQUILLIDAE Manning and Camp, 1993

**Superfamily SQUILLOIDEA** Latreille, 1803

- HARPIOSQUILLIDAE Manning, 1980
- SQUILLIDAE Latreille, 1803

**Reference**

Manning, R.B. 1995. *Stomatopod Crustacea of Vietnam: the legacy of Raoul Serène*. Tokyo, Crustacean Research, The Carcinological Society of Japan, Special Number 4:339 p.

**ODONTODACTYLIDAE**

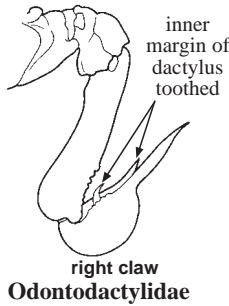
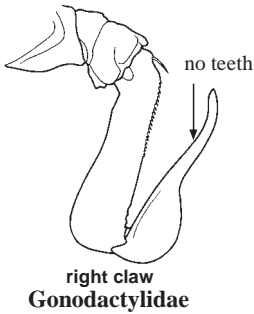
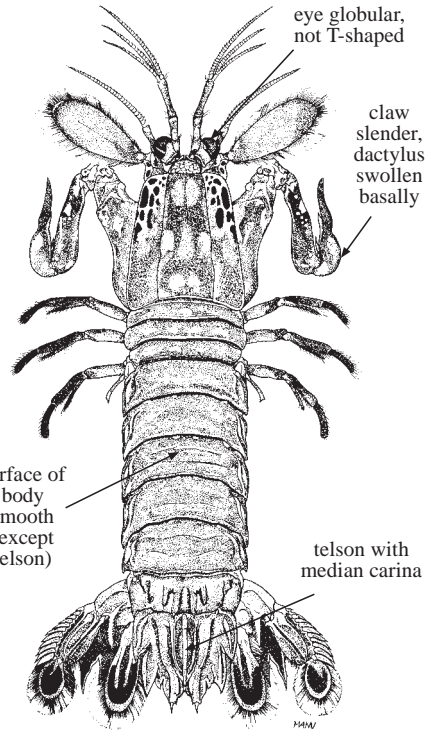
**Odontodactylid mantis shrimps**

**Diagnostic characters:** Moderate-sized mantis shrimps (maximum total length more than 17 to 18 cm). **Eyes globular**, not T-shaped, cornea not bilobed. **Carapace, thorax, and abdomen smooth**, not ornamented with any longitudinal ridges or carinae anterior to last abdominal somite (= telson). Telson with median longitudinal carina. Raptorial claw short and **heavily buttressed at base of terminal segment**, adapted for smashing prey; inner margin of dactylus toothed with no more than 5 short teeth.

**Habitat, biology, and fisheries:** In coarse-bottom or level-bottom habitats. Essentially nothing is known about the biology of odontodactylids and no organized fisheries are known to exist for them.

**Similar families occurring in the area**

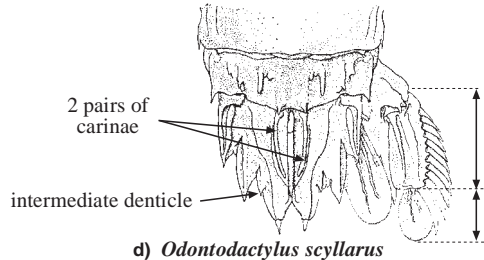
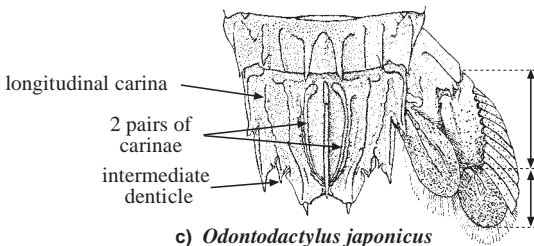
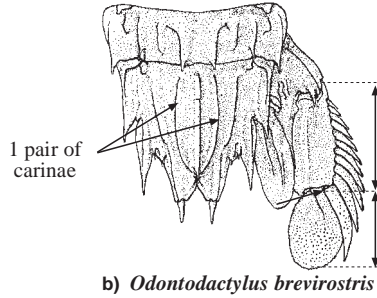
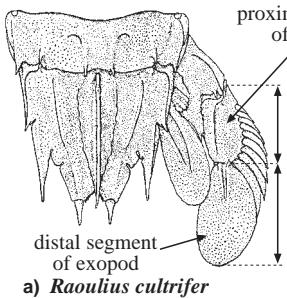
Gonodactylidae: share the buttressed, inflated claw, but have the inner margin of the claw unarmed and are much smaller.



dorsal view  
(after Manning, 1995)

**Key to the species of Odontodactylidae occurring in the area**

- 1a. Proximal segment of uropodal exopod shorter than distal (Fig. 1a) . . . . . *Raoulius cultrifer*
- 1b. Proximal segment of uropodal exopod longer than distal (Fig. 1b-d) . . . . . → 2



**Fig. 1 sixth abdominal somite, telson, and right uropod (dorsal view)** (from Manning, 1967)

- 2a. Ocular scales separate in midline (Fig. 2a); telson with 1 pair of carinae converging under apex of median carina (Fig. 1b) . . . . . *Odontodactylus brevirostris*
- 2b. Ocular scales fused in midline (Fig. 2b); telson with 2 pairs of carinae converging under apex of median carina (Fig. 1c, d) . . . . . → 3

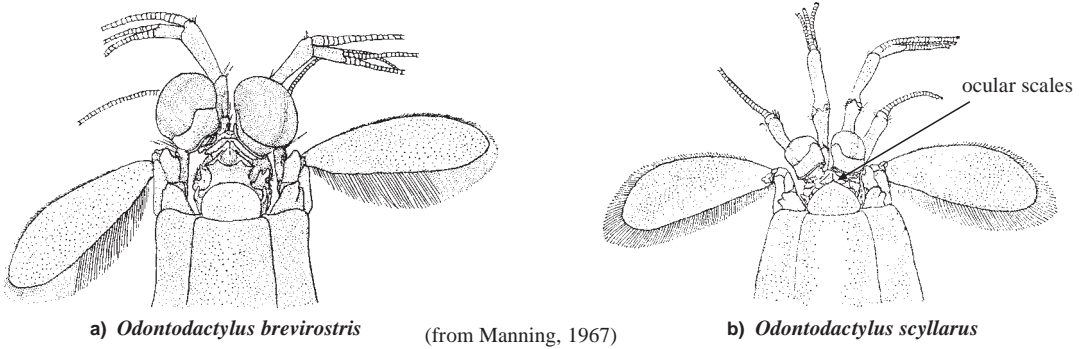


Fig. 2 anterior part of body (dorsal view)

- 3a. Fifth abdominal somite unarmed posterolaterally (Fig. 3a); telson with longitudinal carina extending anteriorly from inner intermediate denticle (Fig. 1c) . . . . . *Odontodactylus japonicus*
- 3b. Fifth abdominal somite with posterolateral spine (Fig. 3b); telson lacking longitudinal carina extending anteriorly from inner intermediate denticle (Fig. 1d) . . . *Odontodactylus scyllarus*

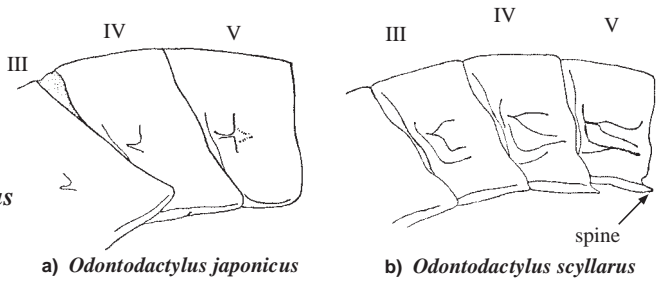


Fig. 3 abdominal somites III-V (lateral view)

List of species occurring in the area

The symbol is given when species accounts are included.

- Odontodactylus brevirostris* (Miers, 1884)
- Odontodactylus japonicus* (De Haan, 1844)
- Odontodactylus scyllarus* (Linnaeus, 1758)
- Raoulius cultrifer* (White, 1850)

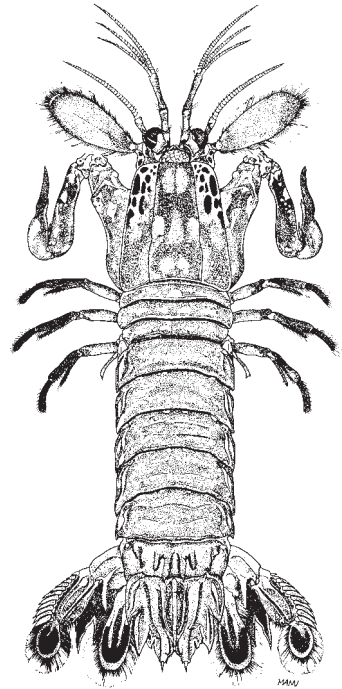
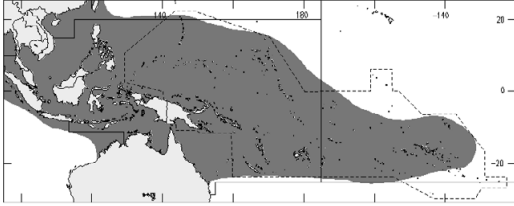
Reference

Manning, R.B. 1967. Review of the genus *Odontodactylus* (Crustacea: Stomatopoda). *Proc. U.S. Natl. Mus.*, 123(3606):1-33.

***Odontodactylus scyllarus* (Linnaeus, 1758)**

**En** - Reef odontodactylid mantis shrimp.

Maximum total length about 17 cm, the largest "smasher". One of the most brightly coloured stomatopods, with deep blue uropods and those and other appendages lined with bright red setae. Lives in existing burrows in shallow rough bottom habitats, often on or near coral reefs. Active during the day and uses its buttressed raptorial claws to smash hard-bodied prey like other scyllarids. Collected primarily by hand. Used in the aquarium trade because of its bright coloration. Widely distributed from Japan to the western Indian Ocean.

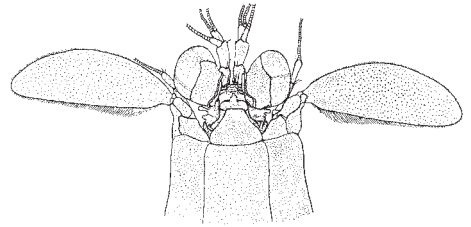
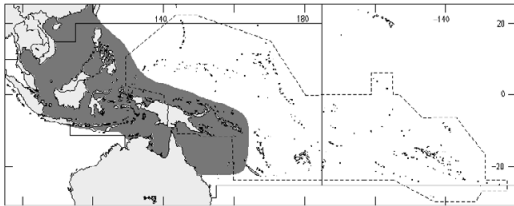


**dorsal view**  
(after Manning, 1995)

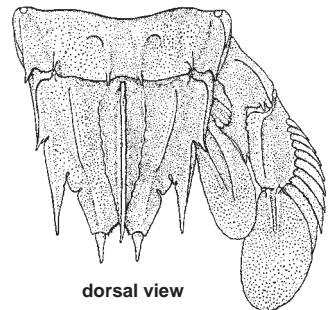
***Raoulius cultrifer* (White, 1850)**

**En** - Pastel odontodactylid mantis shrimp.

Maximum total length about 12 cm. Colour primarily in pastels, with pink or purple uropods and antennal scales. Burrows in level bottoms near shore, in depths to about 25 m. May be taken together with lysiosquillids and squillids in trawling operations and at night lights. Known from southern China to Australia.



**dorsal view**  
**anterior part of body**



**6<sup>th</sup> abdominal somite, telson, and right uropod**  
(from Manning, 1967)

**LYSIOQUILLIDAE**

**Banded mantis shrimps**

**Diagnostic characters:** Eye T-shaped, cornea bilobed. Carapace, thorax, and abdomen smooth, lacking longitudinal ridges or carinae. Telson lacking distinct median carina; marginal teeth or spines of telson inconspicuous. Raptorial claw slender and elongate, adapted for spearing prey, with toothed edge of dactylus bearing numerous, large, serrated teeth or spines. Lysiosquillids usually are clearly banded with alternate light and darkly pigmented bands. Members of the 2 genera likely to be encountered in markets are readily distinguished by 2 features: in *Lysiosquilla*, (1) the antennal scale is slender, elongate, more than 3 times longer than wide and it is outlined by dark pigment, and (2) there is a spine-like projection on the anterior margin of the antennal peduncle; in *Lysiosquillina*, the antennal scale is oval, about 2 times longer than wide, and it bears a central spot or blotch of dark pigment; the antennal peduncle is smooth anteriorly, lacking a distinct spine-like projection.

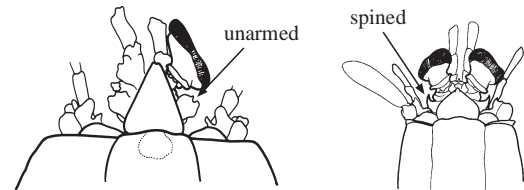
**Habitat, biology, and fisheries:** Almost nothing is known about the biology of lysiosquillids. They form simple burrows with 2 entrances, one at each end, in level-bottom habitats in shallow water, from shore to a depth of about 25 m. The burrow openings may be as much as 10 m apart. Although they generally hunt from the mouth of their burrow, they occasionally leave their burrows and may be caught at night lights or in trawls. Most fisheries for lysiosquillids are artisanal. Five species of lysiosquillids occur within the area, but information on distribution is limited and contradictory. Only 1 species, *Lysiosquillina maculata* (Fabricius, 1793), is particularly common and known to be fished artisanally.

**Similar families occurring in the area**

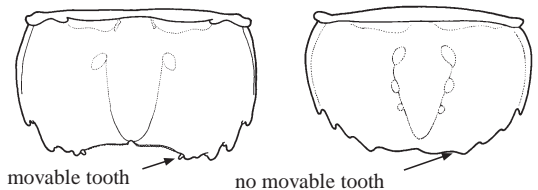
Nannosquillidae: also smooth-bodied and also may be conspicuously banded with alternate dark and light bands of pigment, but much smaller, rarely exceeding 7 cm in length, and of no commercial importance.

**Key to the species of Lysiosquillidae occurring in the area**

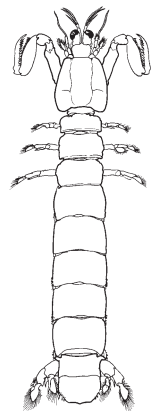
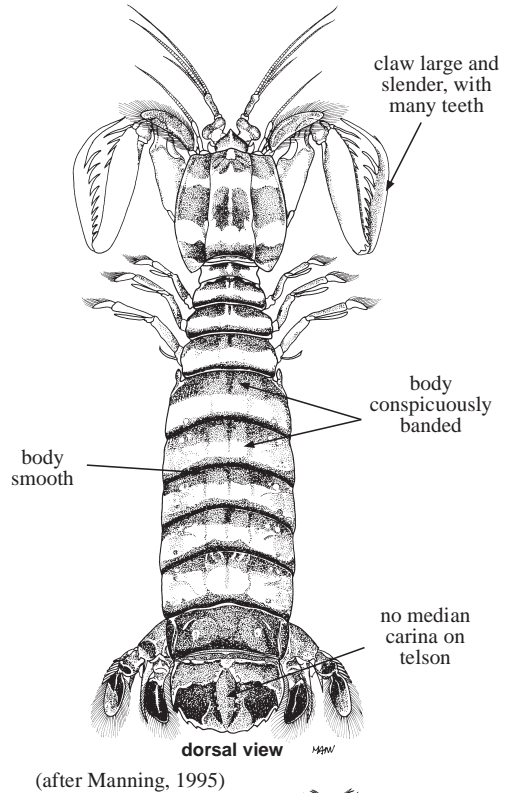
- 1a. Dorsal processes of antennular somite unarmed (Fig. 1a); telson with movable submedian teeth (Fig. 2a) . . . . . *Lysiosquilloides siamensis*
- 1b. Dorsal processes of antennular somite produced into spines (Fig. 1b); telson lacking movable submedian teeth (Fig. 2b) . . . . . → 2



a) *Lysiosquilloides siamensis* b) *Lysiosquilla*, *Lysiosquillina*  
**Fig. 1** anterior part of body (dorsal view)



a) *Lysiosquilloides siamensis* b) *Lysiosquilla*, *Lysiosquillina*  
**Fig. 2** telson (dorsal view)



**Nannosquillidae**



2a. Antennal protopod with angled dorsal projection (Fig. 3a); antennal scale slender, length more than 3 times width (Fig. 3a) . . . . . (*Lysiosquilla*) → 3

2b. Antennal protopod lacking angled dorsal projection (Fig. 3b); antennal scale broad, length less than 3 times width (Fig. 3b) . . . . . (*Lysiosquillina*) → 4

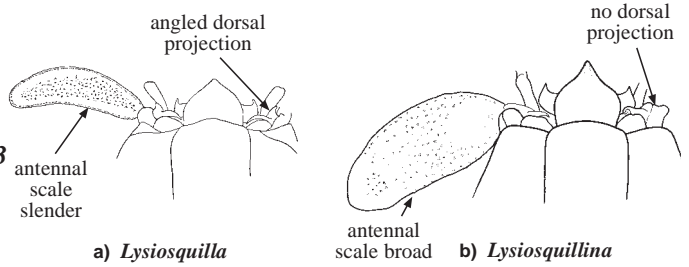


Fig. 3 anterior part of body (dorsal view)

3a. Median carina on rostral plate flanked by longitudinal grooves (Fig. 4a); dactylus of raptorial claw with 7 or 8 teeth (Fig. 5a) . . . . . *Lysiosquilla sulcirostris*

3b. Median carina on rostral plate not flanked by longitudinal grooves (Fig. 4b); dactylus of raptorial claw with 10 to 13 teeth (Fig. 5b) . . . . . *Lysiosquilla tredecimdentata*

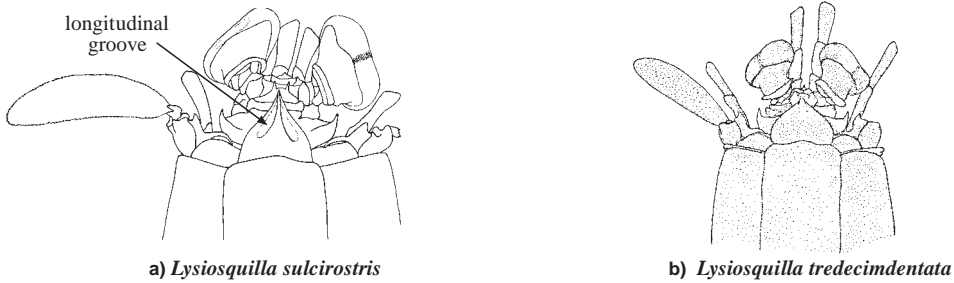


Fig. 4 anterior part of body (dorsal view)

4a. Distal end of uropodal endopod light (Fig. 6a); dactylus of raptorial claw with 7 to 9 teeth . . . . . *Lysiosquillina sulcata*

4b. Distal end of uropodal endopod dark (Fig. 6b); dactylus of raptorial claw with 10 or 11 teeth (usually less in adult females) . . . . . *Lysiosquillina maculata*

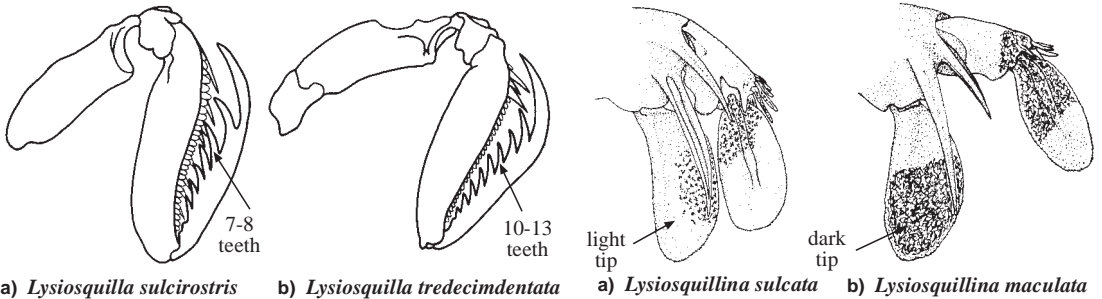


Fig. 5 right claw

Fig. 6 left uropod (ventral view)

**List of species occurring in the area**

The symbol is given when species accounts are included.

*Lysiosquilla sulcirostris* Kemp, 1913

*Lysiosquilla tredecimdentata* Holthuis, 1941

*Lysiosquillina maculata* (Fabricius, 1793)

*Lysiosquillina sulcata* (Manning, 1978)

*Lysiosquilloides siamensis* Naiyanetr, 1980 (a single record from Thailand)

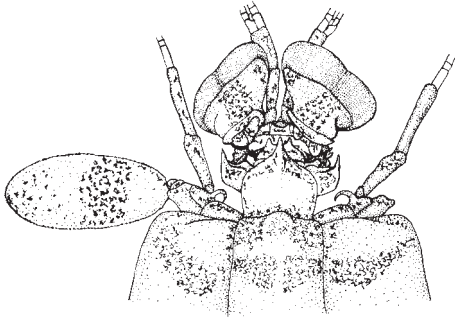
**Reference**

Manning, R.B. 1978. Synopses of the Indo-West-Pacific species of *Lysiosquilla* Dana, 1852 (Crustacea: Stomatopoda: Lysiosquillidae). *Smithson. Contrib. Zool.*, (259):16 p.

***Lysioquillina maculata*** (Fabricius, 1793)

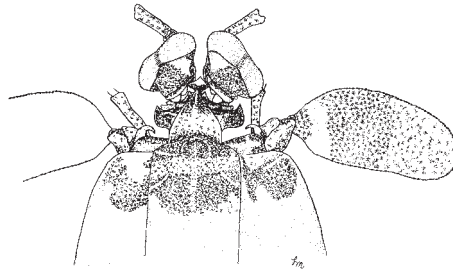
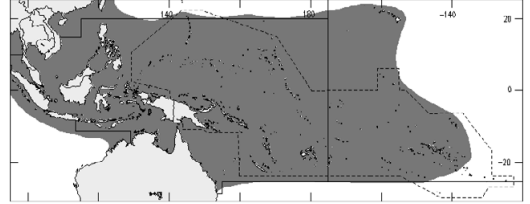
**En** - Common banded mantis shrimp.

Maximum total length about 38 cm; the characteristic raptorial claw may be 4 cm long. Distinctly banded with alternate light and dark bands. Burrows in level bottoms near shore. Collected with spears, snares and bait, or at night lights. Widely distributed from Japan and Hawaii to the western Indian Ocean.



male

anterior part of body



female

(from Manning, 1978)

**HARPIOSQUILLIDAE**

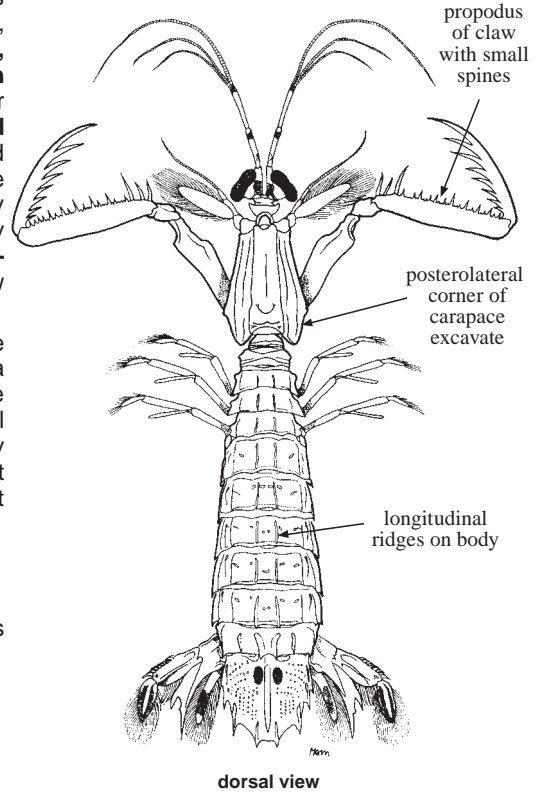
**Harpiosquillid mantis shrimps**

**Diagnostic characters:** Very large mantis shrimps (maximum total length at least 30 cm). Eye very large, T-shaped, cornea strongly bilobed. **Carapace, thorax, and abdomen with longitudinal ridges. Telson with median longitudinal carina and conspicuous posterior spines. Posterolateral corners of carapace deeply and conspicuously excavate.** Raptorial claw very large and conspicuous, adapted for spearing. In males outer edge of the claw forming an obtuse angle; in females it is evenly rounded. Propodus of raptorial claw with irregularly spaced, large and **small erect spines on margin opposite terminal segment (= dactylus)**. Dactylus of claw usually with 7 or 8 large, serrated teeth.

**Habitat, biology, and fisheries:** Harpiosquillids are burrowers in level bottoms. They use the burrow as a refuge while waiting for prey and they also leave the burrow to hunt prey. Their large raptorial claws are well adapted for capturing fishes. There is no organized fishery for these species which reach markets as bycatch. At least 9 species occur within the area, but only 2 are abundant enough to be sold in markets.

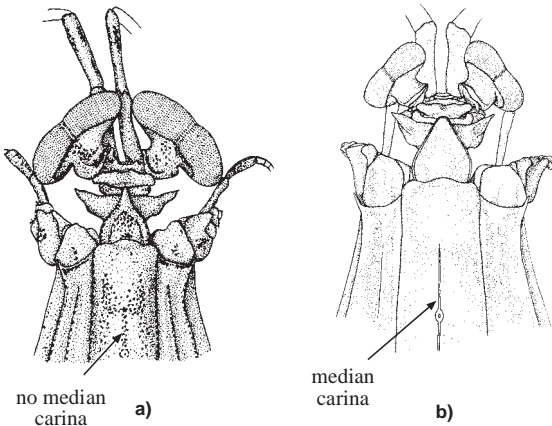
**Similar families occurring in the area**

Squillidae: carapace rounded posterolaterally; propodus of raptorial claw lined with blunt pectinations.



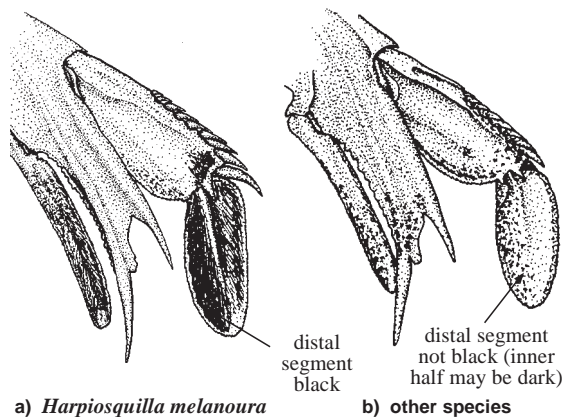
**Key to the species of Harpiosquillidae occurring in the area**

- 1a. Carapace lacking median carina (Fig. 1a); distal segment of uropodal exopod entirely black (Fig. 2a) . . . . . *Harpiosquilla melanoura*
- 1b. Carapace with median carina (Fig. 1b); distal segment of uropodal exopod with white midline, or inner half dark (Fig. 2b) . . . . . → 2



**Fig. 1 anterior part of body (dorsal view)**

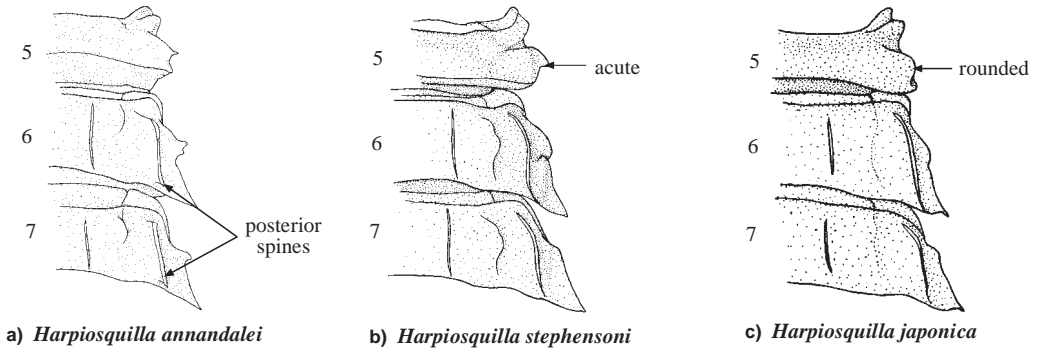
(from Manning, 1969)



**Fig. 2 left uropod (ventral view)**

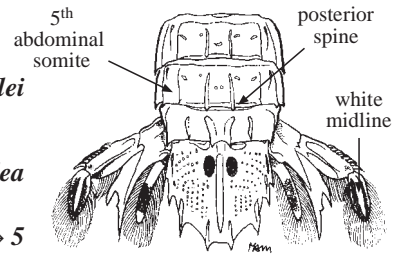
(from Manning, 1969)

- 2a. Intermediate carinae of thoracic somites with posterior spine (Fig. 3a) . . . . . → 3
- 2b. Intermediate carinae of thoracic somites unarmed (Fig. 3b, c) . . . . . → 4



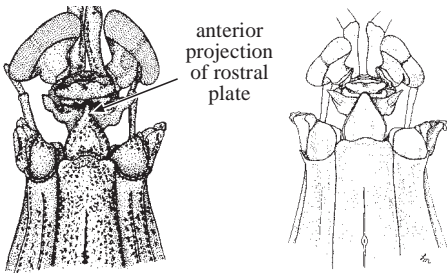
**Fig. 3 lateral processes of thoracic somites 5-7**  
(from Manning, 1969)

- 3a. Submedian carinae of fifth abdominal somite with posterior spine (Fig. 4); distal segment of uropodal exopod black with white midline (Fig. 4); total length to 15 cm or less . . . . . *Harpiosquilla annandalei*
- 3b. Submedian carina of fifth abdominal somite unarmed; distal segment of uropodal exopod with inner half dark; total length to at least 30 cm . . . . . *Harpiosquilla raphidea*

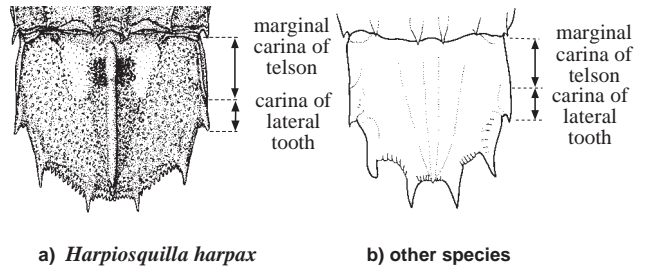


*Harpiosquilla annandalei*  
**Fig. 4 posterior part of body (dorsal view)**

- 4a. Rostral plate with anterior projection (Fig. 5a) . . . . . → 5
- 4b. Rostral plate without anterior projection (Fig. 5b) . . . . . → 7
- 5a. Marginal carina of telson more than twice as long as carina of lateral tooth (Fig. 6a); dactylus of raptorial claw with 8 teeth . . . . . *Harpiosquilla harpax*
- 5b. Marginal carina of telson twice or less than twice as long as carina of lateral tooth (Fig. 6b); dactylus of raptorial claw with 9 teeth . . . . . → 6



a) *Harpiosquilla harpax*      b) *Harpiosquilla stephensoni*  
**Fig. 5 anterior part of body (dorsal view)**  
(from Manning, 1969)



a) *Harpiosquilla harpax*      b) other species  
**Fig. 6 telson (dorsal view)**

- 6a. Intermediate carinae of second abdominal somite with posterior spine . . . . . *Harpiosquilla indica*
- 6b. Intermediate carinae of second abdominal somite unarmed . . . . . *Harpiosquilla philippina*

- 7a. Dactylus of raptorial claw with 7 teeth; fifth thoracic somite acute laterally (Fig. 3b) . . . . . *Harpiosquilla stephensoni*
- 7b. Dactylus of raptorial claw with 8 teeth; fifth thoracic somite rounded laterally (Fig. 3c). . . . . → 8

- 8a. Rostral plate longer than broad (Fig. 7a); marginal carina of telson twice as long as carina of lateral tooth . . . . . *Harpiosquilla intermedia*
- 8b. Rostral plate length and width subequal (Fig. 7b); marginal carina of telson less than twice as long as carina of lateral tooth . . . . . *Harpiosquilla japonica*

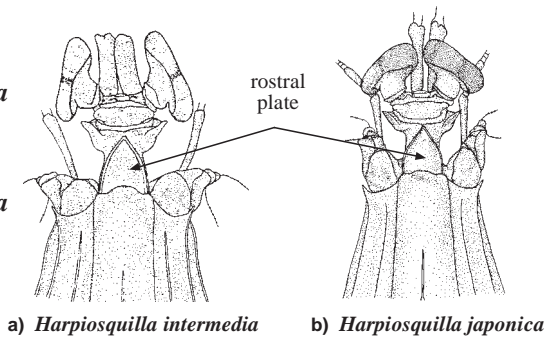






Fig. 7 anterior part of body (dorsal view)

**List of species occurring in the area**

The symbol  is given when species accounts are included.

-  *Harpiosquilla annandalei* (Kemp, 1911)
-  *Harpiosquilla harpax* (De Haan, 1844)
- Harpiosquilla indica* Manning, 1969
- Harpiosquilla intermedia* Manning and Michel, 1973
- Harpiosquilla japonica* Manning, 1969
- Harpiosquilla melanoura* Manning, 1968
- Harpiosquilla philippina* Garcia, 1978
-  *Harpiosquilla raphidea* (Fabricius, 1798)
- Harpiosquilla stephensoni* Manning, 1969

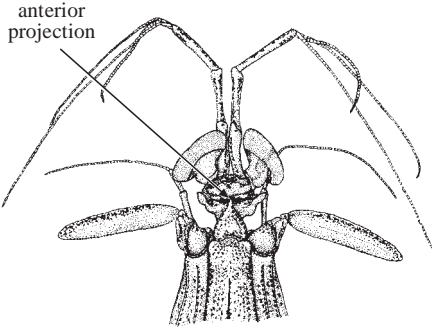
**Reference**

Manning, R.B. 1969. A review of the genus *Harpiosquilla* (Crustacea: Stomatopoda), with descriptions of three new species. *Smithson. Contrib. Zool.*, (36):41 p.

***Harpiosquilla harpax* (De Haan, 1844)**

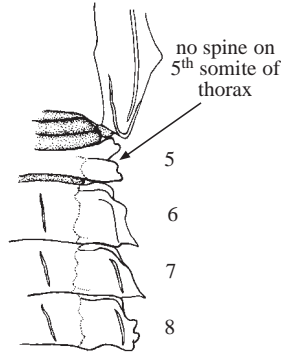
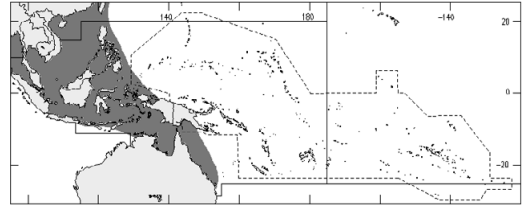
**En** - Robber harpiosquillid mantis shrimp.

Maximum total length about 25 cm; usually 17 cm or less. Inhabits level bottom habitats, near shore to depths of about 100 m. Collected by trawl, trapping, or hook-and-line. Japan to the Red Sea.



anterior part of body

(from Manning, 1969)

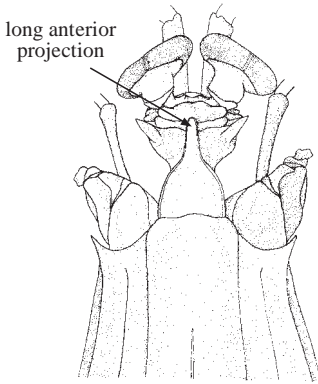


lateral processes of thoracic somites 5-7

***Harpiosquilla raphidea* (Fabricius, 1798)**

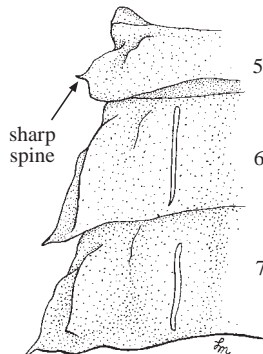
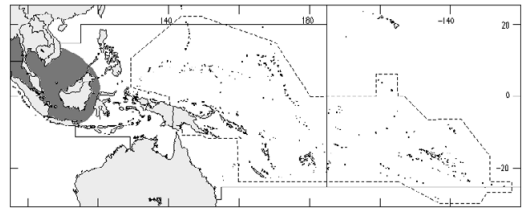
**En** - Giant harpiosquillid mantis shrimp.

The largest known squilloid; maximum total length more than 33 cm, although most specimens range from 16 to 29 cm. Inhabits level bottoms in shallow water and can be found in estuaries. Collected in traps, by trawls, and by hand. Indo-Malaya and Indonesia to East Africa.



anterior part of body

(from Manning, 1969)



lateral processes of thoracic somites 5-7

## SQUILLIDAE

### Squillid mantis shrimps

**Diagnostic characters:** Large mantis shrimps (maximum total length more than 20 cm). Eye T-shaped, cornea bilobed. **Carapace, thorax, and abdomen with longitudinal ridges or carinae. Telson with median longitudinal ridge and conspicuous posterior spines. Posterolateral corners of carapace evenly rounded, not excavate.** Raptorial claw large and conspicuous, slender, adapted for spearing. Dactylus of raptorial claw usually with 5 or 6 serrated teeth on inner margin. Propodus of raptorial claw lined with short, **blunt pectinations on margin opposite toothed margin of distal segment (= dactylus).**

**Habitat, biology, and fisheries:** Squillids are burrowers in level bottoms and they seek prey at night. They are often collected by commercial trawls fishing for penaeid shrimps. Some of the larger and more abundant species have been reported to be edible and may be found in markets, but there is no organized fishery for them in the area. One species of *Oratosquilla* is fished commercially in Japan.

#### Similar families occurring in the area

Harpiosquillidae: carapace with posterolateral excavation; propodus of raptorial claw lined with erect spines.

#### Notes on genera of interest to fisheries

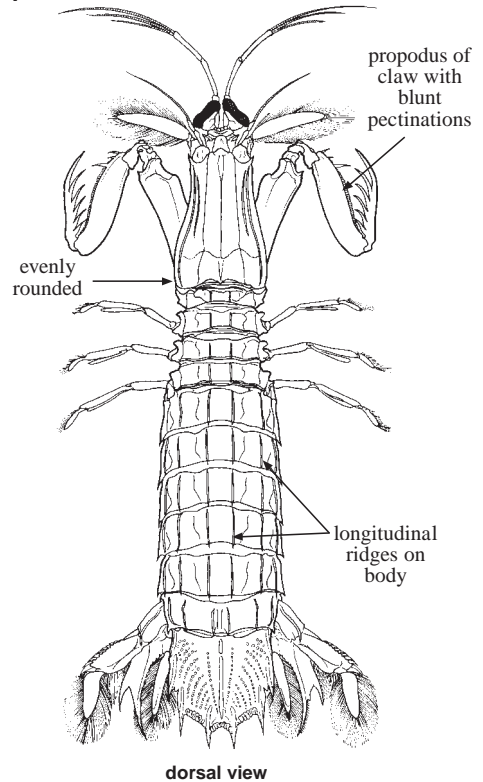
Species of at least 5 genera, *Cloridopsis*, *Erugosquilla*, *Miyakea*, *Oratosquilla*, and *Oratosquillina*, can be expected to be found in markets in the Philippines and in the continental parts of the area. These genera can be distinguished as follows:

Species of *Cloridopsis* differ from other squillids that might be found in markets in having but one broad, anteriorly-curved lateral spine on the fifth thoracic somite, the first free somite behind the carapace. In all of the other squillids large enough to be found in markets (except *Anchisquilla fasciata*), the lateral process on the fifth thoracic somite is distinctly bilobed, with an anteriorly-directed acute lobe and a shorter, laterally-directed acute lobe. The terminal segment of the raptorial claw usually is armed with 5 serrated spines. Adults rarely exceed 10 cm in length. Six species of *Cloridopsis* are known from the Indo-West Pacific, but only *C. scorpio* is relatively common.

Members of *Erugosquilla* can be distinguished by their broad, smooth, carapace, with its anterior margin more than half as long as its median length. The carapace is characteristically smooth and shiny, lacking any hint of roughness or pits. The median carina of the carapace completely lacks the anterior bifurcation, characteristic of members of *Miyakea*, *Oratosquilla*, and *Oratosquillina*. The raptorial claw is armed with 6 serrated teeth on the opposable margin of its terminal segment. Bright blue color on the uropods is characteristic of members of this genus, and in at least 1 species the usual rounded lobe between the spines of the basal prolongation of the uropod may be replaced by a sharp spine. *Erugosquilla woodmasoni* (Kemp, 1911) is the most common member of this genus, which contains 4 species.

A single species of *Miyakea* is abundant enough to be found in markets, and it occurs on level-bottom habitats throughout the area. *Miyakea nepa* has relatively small eyes and a distinctive median carina on the carapace that is uninterrupted, splits **posterior to** the dorsal pit on the midline of the carapace, and extends almost to the anterior margin of the carapace. The raptorial claw is armed with 6 teeth on its margin that folds. This is one of the most common species of squillids in the western part of the area. *Miyakea nepa* (Latreille, 1828) is the only abundant and widespread member of this genus which contains 1 other species.

*Oratosquilla* and *Oratosquillina* have much larger eyes than species of *Miyakea*, and in both genera the median carina of the carapace splits or bifurcates **anterior to** the pit on the midline of the carapace. In *Oratosquilla* the median carina of the carapace is entire, uninterrupted, from its base to its bifurcate anterior part near the anterior margin. In members of *Oratosquillina*, the median carina of the carapace is interrupted at its bifurcation, and the anterior branches of the bifurcation may be indistinct or absent. In both genera the distal segment of the claw usually is armed with 6 teeth, but some species of *Oratosquillina* have but 5 teeth on the claw.



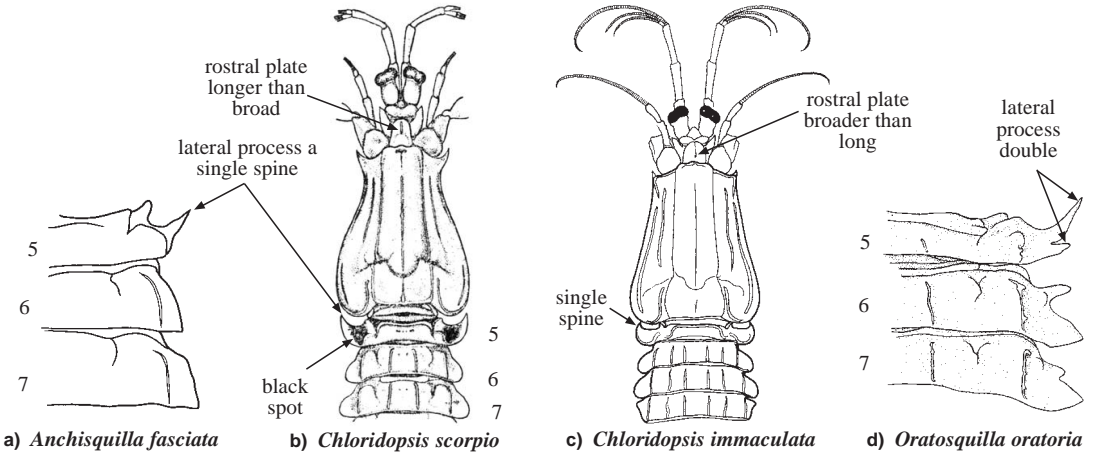
**dorsal view**  
(after Manning, 1995)

*Oratosquilla* includes only 4 species, 1 of which, *O. oratoria*, occurs in the western part of the area, in the northern part of Viet Nam. A second species is known from a single record from New Caledonia, and a third from a single record in the Philippines.

*Oratosquillina* includes 22 species, 3 of which, *O. gravieri*, *O. interrupta*, and *O. perpensa* are common enough in the area to be found in markets. *Oratosquillina interrupta* is one of the most characteristic species of the genus, as it can be recognized at once by the convex lobe between the spines of the ventral prolongation of the uropod.

**Key to species of interest to fisheries occurring in the area**

- 1a. Lateral process of fifth thoracic somite a single, anteriorly- or anterolaterally-directed spine (Fig. 1a-c) . . . . . → 2
- 1b. Lateral process of fifth thoracic somite double, with an anteriorly-directed spine and a shorter, laterally-directed lobe (Fig. 1d) . . . . . → 4
  
- 2a. Lateral process of fifth thoracic somite a slender, straight spine, directed anterolaterally (Fig. 1a); telson with distinct longitudinal carinae on surface . . . . . *Anchisquilla fasciata*
- 2b. Lateral process of fifth thoracic somite a broad, anteriorly-curved spine (Fig. 1b, c); telson lacking longitudinal carinae on surface . . . . . → 3
  
- 3a. Rostral plate longer than broad (Fig. 1b); lateral process of fifth thoracic somite with black spot (Fig. 1b) . . . . . *Chloridopsis scorio*
- 3b. Rostral plate broader than long (Fig. 1c); lateral process of fifth thoracic somite lacking any dark color (Fig. 1c) . . . . . *Chloridopsis immaculata*

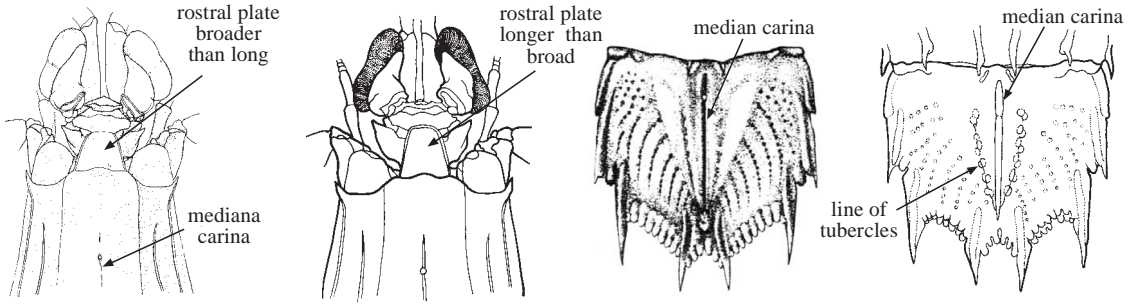


**Fig. 1** anterior part of body and lateral thoracic somites 5-7 (dorsal view)

- 4a. Thorax and abdomen completely covered with longitudinal carinae . . . . . → 5
- 4b. Thorax and abdomen with no more than 8 longitudinal carinae. . . . . → 6
  
- 5a. Submedian carinae of sixth to eighth thoracic somites and fourth to sixth abdominal somites ending in spines . . . . . *Keijia lirata*
- 5b. Most carinae on thorax and abdomen terminating posteriorly in spines . . *Carinosquilla multicarinata*
  
- 6a. Dorsal surface of carapace smooth, shiny, lacking any trace of an anterior bifurcation on the median carina (Fig. 2a, b) . . . . . → 7
- 6b. Dorsal surface of carapace pitted or eroded, at least part of an anterior bifurcation of the median carina present (Fig. 4a, b) . . . . . → 8

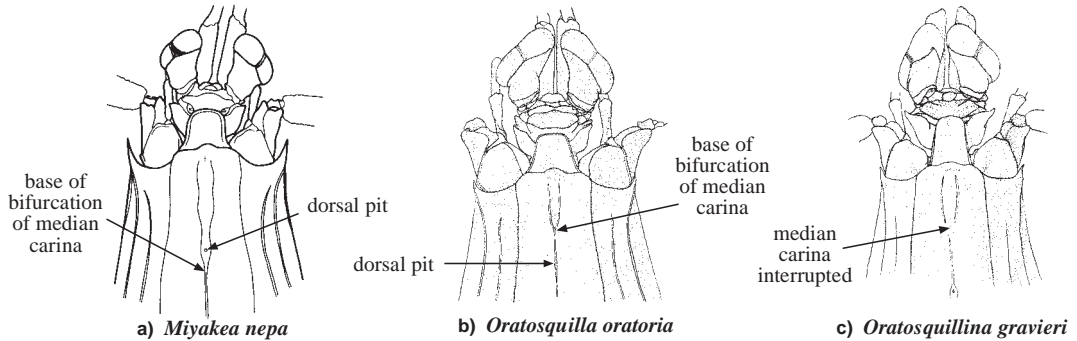


- 7a. Dorsal surface of telson lacking a line of tubercles on each side of median carina (Fig. 3a); rostral plate broader than long (Fig. 2a) . . . . . *Erugosquilla woodmasoni*
- 7b. Dorsal surface of telson with a line of tubercles on each side of median carina, the 2 lines converging posteriorly under apical spine of median carina (Fig. 3b); rostral plate longer than broad.(Fig. 2b) . . . . . *Erugosquilla hesperia*



a) *Erugosquilla woodmasoni*      b) *Erugosquilla hesperia*      a) *Erugosquilla woodmasoni*      b) *Erugosquilla hesperia*  
**Fig. 2 anterior part of body (dorsal view)**                                  **Fig. 3 telson (dorsal view)**

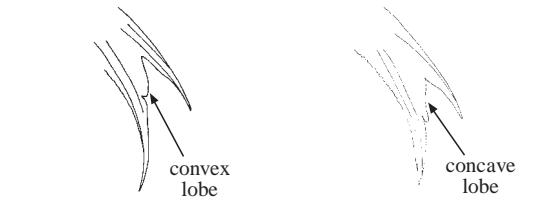
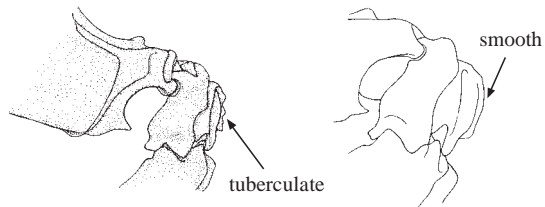
- 8a. Median carina of carapace bifurcates posterior to dorsal pit (Fig. 4a) . . . . . *Miyakea nepa*
- 8b. Median carina of carapace bifurcates anterior to dorsal pit (Fig. 4b, c) . . . . . → 9
- 9a. Median carina of carapace entire, not interrupted at base of bifurcation (Fig. 4b) . . . . . *Oratosquilla oratoria*
- 9b. Median carina of carapace interrupted at base of bifurcation (Fig. 4c) . . . . . → 10



a) *Miyakea nepa*      b) *Oratosquilla oratoria*      c) *Oratosquillina gravieri*  
**Fig. 4 anterior part of body (dorsal view)**

- 10a. Dactylus of raptorial claw with 5 teeth . . . . . *Oratosquillina quinquedentata*
- 10b. Dactylus of raptorial claw with 6 teeth . . . . . → 11

- 11a. Dorsal ridge on carpus of raptorial claw tuberculate (Fig. 5a); lobe between spines of basal prolongation of uropod convex (Fig. 6a) . . . . . *Oratosquillina interrupta*
- 11b. Dorsal ridge on carpus of raptorial claw smooth, undivided (Fig. 5b); lobe between spines of basal prolongation of uropod concave (Fig. 6b) . . . . . → 12



a) *Oratosquillina interrupta*      b) *Oratosquillina perpensa*      a) *Oratosquillina interrupta*      b) *Oratosquillina perpensa*  
**Fig. 5 carpus of right raptorial claw (dorsal view)**      **Fig. 6 basal prolongation of left uropod (ventral view)**

- 12a. Rostral plate broader than long (Fig. 7a); anterolateral spines of carapace extending to or overreaching base of rostral plate (Fig. 7a) . . . . . *Oratosquillina perpensa*
- 12b. Rostral plate longer than broad (Fig. 7b); anterolateral spines of carapace not overreaching base of rostral plate (Fig. 7b) . . . . . → 13
- 13a. Lateral process of sixth thoracic somite with broad, rectangular anterior lobe (Fig. 8a) . . . . . *Oratosquillina sollicitans*
- 13b. Lateral process of sixth thoracic somite with slender, triangular anterior lobe, acute apically (Fig. 8b) . . . . . *Oratosquillina gravieri*

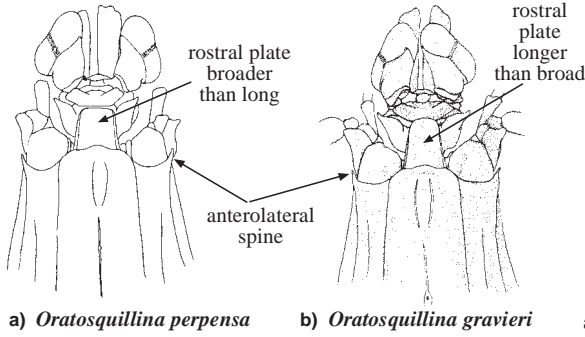


Fig. 7 anterior part of body (dorsal view)

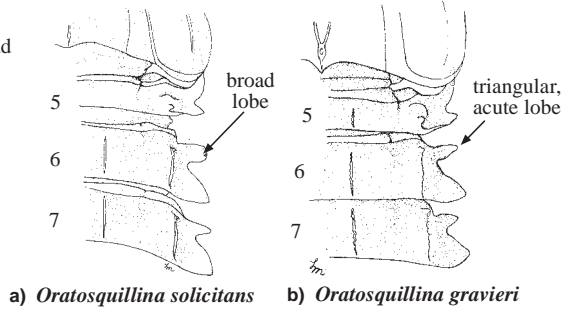


Fig. 8 lateral processes of thoracic somites 5-7 (from Manning, 1978)

**List of species occurring in the area**

The symbol is given when species accounts are included.

- Anchisquilla fasciata* (De Haan, 1844)
- Carinosquilla multicarinata* (White, 1848)
- Cloridopsis immaculata* (Kemp, 1913)
- Cloridopsis scorpio* (Latreille, 1828)
- Erugosquilla hesperia* (Manning, 1968)
- Erugosquilla woodmasoni* (Kemp, 1911)
- Keijia lirata* (Kemp and Chopra, 1921)
- Miyakea holoschista* (Kemp, 1911)
- Miyakea nepa* (Latreille, 1828)
- Oratosquilla calumnia* (Townsend, 1953)
- Oratosquilla mauritiana* (Kemp, 1913)
- Oratosquilla oratoria* (De Haan, 1844)
- Oratosquillina anomala* (Tweedie, 1935)
- Oratosquillina asiatica* (Manning, 1978)
- Oratosquillina fossulata* (Moosa, 1986)
- Oratosquillina gravieri* (Manning, 1978)
- Oratosquillina inornata* (Tate, 1883)
- Oratosquillina interrupta* (Kemp, 1911)
- Oratosquillina pentadactyla* (Manning, 1978)
- Oratosquillina perpensa* (Kemp, 1911)
- Oratosquillina quinquedentata* (Brooks, 1886)
- Oratosquillina sollicitans* (Manning, 1978)
- Oratosquillina stephensoni* (Manning, 1978)
- Oratosquillina subtilis* (Manning, 1978)

**References**

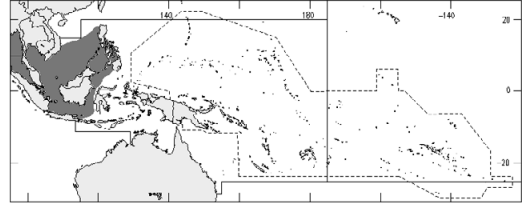
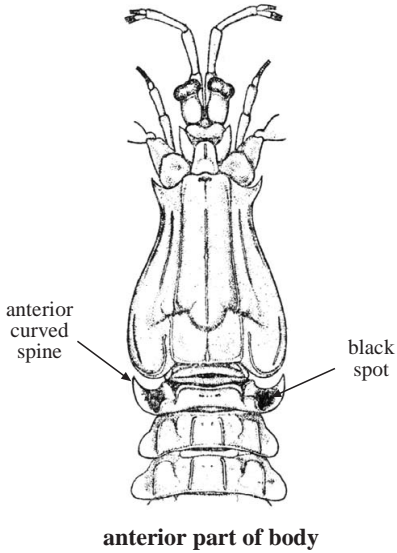
Manning, R.B. 1971. Keys to the species of *Oratosquilla*, (Crustacea: Stomatopoda), with descriptions of two new species. *Smithson. Contrib. Zool.*, (71):16 p.

Manning, R.B. 1978. Further observations on *Oratosquilla*, with accounts of two new genera and nine new species (Crustacea: Stomatopoda: Squillidae). *Smithson. Contrib. Zool.*, (272):44 p.

*Cloridopsis scorpio* (Latreille, 1828)

**En** - Spotted squillid mantis shrimp.

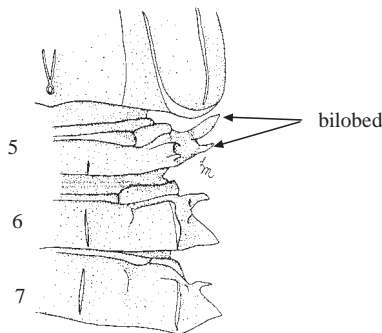
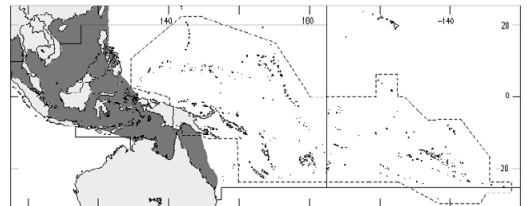
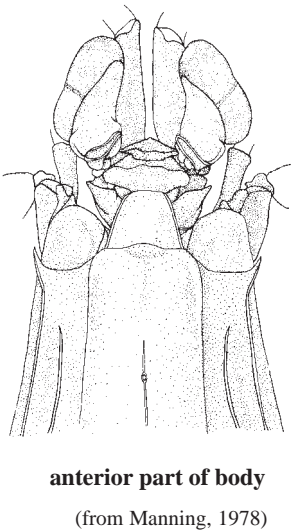
Maximum total length 10 cm or less. A shore species not known to occur in brackish water. Taken by traps. The most common species among the 6 *Cloridopsis* known from the Indo-West Pacific. Known from Viet Nam, Indonesia, and Malaysia to Pakistan.



*Erugosquilla woodmasoni* (Kemp, 1911)

**En** - Smooth squillid mantis shrimp.

Maximum total length about 15 cm. A common shallow water species inhabiting burrows on level bottoms. Commonly taken by trawlers. Widely distributed from Japan to the western Indian Ocean.

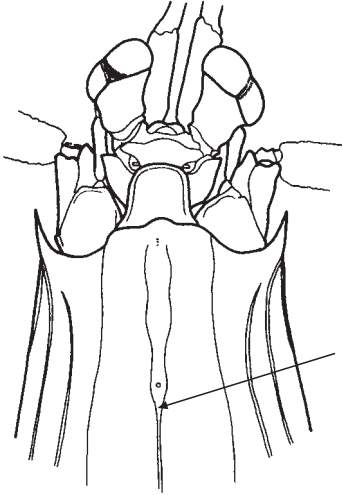


lateral processes of thoracic somites 5-7

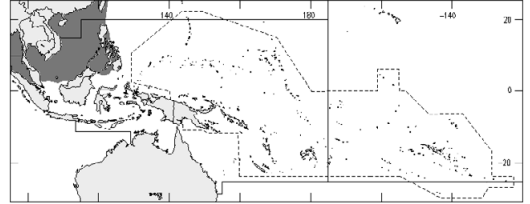
***Miyakea nepa* (Latreille, 1828)**

**En** - Smalleyed squillid mantis shrimp.

Maximum total length about 17 cm. A very common shore species that burrows in level-bottom habitats and one of the most common squillids in the western part of the area. Usually taken by trawls. Known from Taiwan Province of China to the Red Sea.



anterior part of body

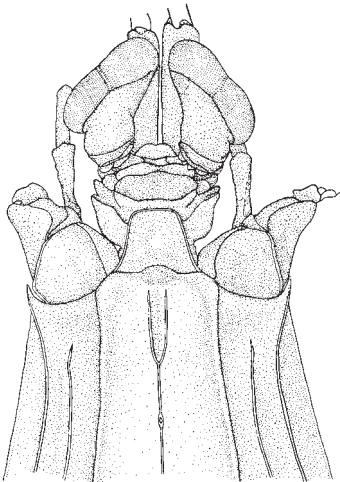


median carina bifurcates posterior to dorsal pit

***Oratosquilla oratoria* (De Haan, 1844)**

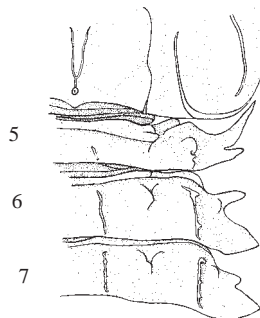
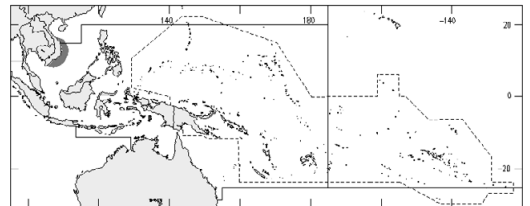
**En** - Japanese squillid mantis shrimp.

Maximum total length more than 18 cm. The common commercial species in Japan. Burrows in near-shore level-bottom habitats. Taken by trawls and traps. Known from Japan to Hong Kong (China) and Viet Nam, rare in southern part of its range.



anterior part of body

(from Manning, 1971)

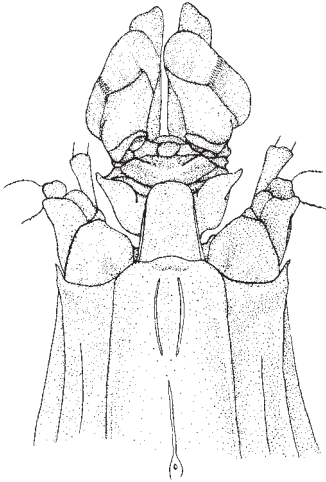


lateral processes of thoracic somites 5-7

***Oratosquillina gravieri* (Manning, 1978)**

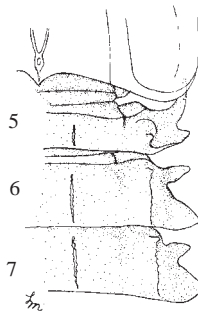
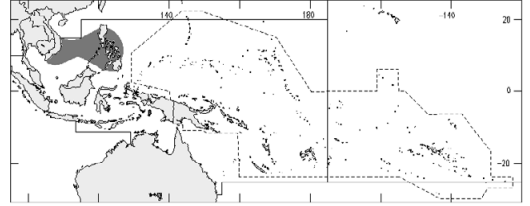
**En** - Vietnamese squillid mantis shrimp.

Maximum total length about 11 cm. Burrows in level bottoms in depths of 15 to 25 to more than 100 m. Taken by trawls. Known only from Viet Nam, where it is a common species, and the Philippines.



**anterior part of body**

(from Manning, 1978)

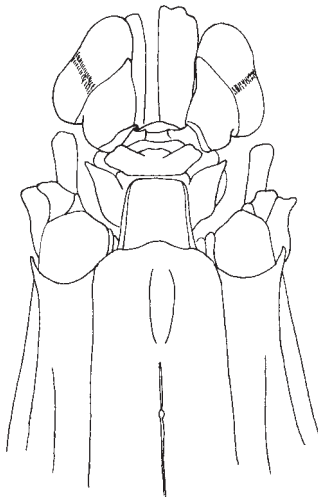


**lateral processes of thoracic somites 5-7**

***Oratosquillina perpensa* (Kemp, 1911)**

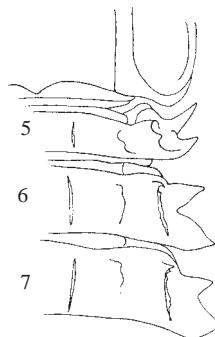
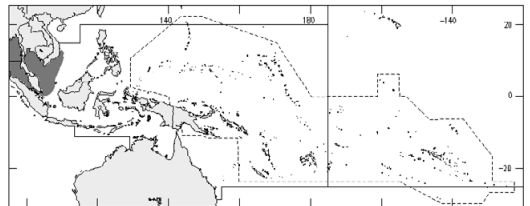
**En** - Common squillid mantis shrimp.

Maximum total length about 10 cm. Occurs in sublittoral, level-bottom habitats, in depths of 100 m or less. Usually taken in trawls. Known from localities between southern Taiwan Province of China and Myanmar.



**anterior part of body**

(from Manning, 1978)

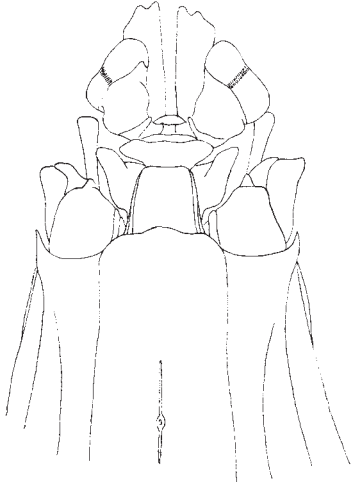


**lateral processes of thoracic somites 5-7**

***Oratosquillina quinquedentata* (Brooks, 1886)**

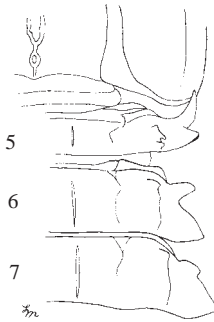
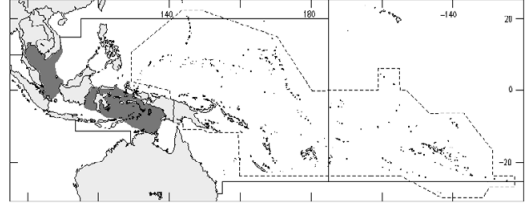
**En** - Fivespined squillid mantis shrimp.

Maximum total length 14 cm. Occurs in sublittoral, level-bottom habitats in depths of at least 50 m. Usually taken in trawls. Known from the Arafura Sea, Gulf of Thailand, and Bombay, India.



**anterior part of body**

(from Manning, 1978)

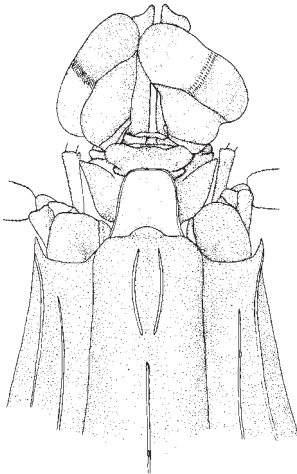


**lateral processes of  
thoracic somites 5-7**

***Oratosquillina solicitans* (Manning, 1978)**

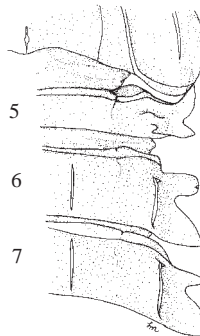
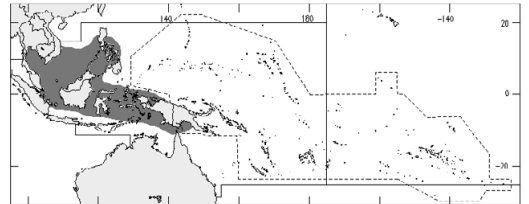
**En** - Variable squillid mantis shrimp.

Maximum total length less than 10 cm. Occurs in level-bottom habitats near shore. Usually taken in trawls. Known from the western Pacific, Taiwan Province of China, the Gulf of Thailand, Malaysia, and Indonesia.



**anterior part of body**

(from Manning, 1978)



**lateral processes of  
thoracic somites 5-7**