



**FAO SPECIES IDENTIFICATION SHEETS  
FOR FISHERY PURPOSES**

**WESTERN INDIAN OCEAN  
FISHING AREA 51**



**VOLUME  
V**



**DENMARK  
FUNDS - IN-TRUST**



**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**

**FAO SPECIES IDENTIFICATION SHEETS**

**FOR FISHERY PURPOSES**

**WESTERN INDIAN OCEAN**

(Fishing Area 51)

edited by

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**VOLUME V**

CONTENTS:

**Bony Fishes**

Families: Triglidae to Zeidae

Guide to Families Occurring in the Area

List of Species Occurring in the Area

**Chimaeras**

General Remarks

Key to Families, Genera and Species  
Reported from the Area

Families: Nephopidae to Synaxidae

**Shrimps and Prawns**

Technical Terms

General Remarks

List of Families Occurring in the Area

Families: Alpheidae to Solenoceridae

**Sharks**

Technical Terms and Principal Measure-  
ments Used

General Remarks

Key with Picture Guide to Families  
Occurring in the Area

Families: Alopiidae to Triakidae

**Sea Turtles**

Technical Terms and Principal Measure-  
ments Used

General Remarks

Key to Genera Occurring in the Area

List of Species Occurring in the Area

Families: Cheloniidae to Dermochelidae

**Lobsters**

Technical Terms and Principal Measure-  
ments Used

General Remarks

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**

Rome, 1984

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Identification sheets. Taxonomy. Geographic distribution. Fisheries. Vernacular names. Bony fishes. Chimaeras. Sharks. Lobsters. Shrimps. Sea turtles. W.I.O.

# WESTERN INDIAN OCEAN

FISHING AREA 51

FAO SPECIES IDENTIFICATION SHEETS

## VOLUME 5

### TABLE OF CONTENTS

#### **BONY FISHES**

[TRIGLIDAE](#)  
[URANOSCOPIDAE](#)  
[XIPHIIDAE](#)  
[ZEIDAE](#)

#### **CHIMAERAS**

[General remarks](#)  
[Key to families, genera and species reported from the area](#)  
[List of families and species of chimaeras occurring in the area](#)

#### **SHARKS**

[Technical terms and principal measurement used](#)  
[General remarks](#)  
[Key with picture guide to families occurring in the area](#)  
[List of species occurring in the area](#)

[ALUPIIDAE](#)  
[CARCHARHINIDAE](#)  
[CHLAMYDOSELACHIDAE](#)  
[ECHINORHINIDAE](#)  
[GINGLYMOSTOMATIDAE](#)  
[HEMIGALEIDAE](#)  
[HEMISCYLLIIDAE](#)  
[HETERODONTIDAE](#)  
[HEXANCHIDAE](#)  
[LAMNIDAE](#)  
[MITSUKURINIDAE](#)  
[ODONTASPIDIDAE](#)  
[PRISTIOPHORIDAE](#)  
[PROSCYLLIIDAE](#)  
[PSEUDOCARCHARIIDAE](#)  
[PSEUDOTRIAKIDAE](#)  
[RHINIODONTIDAE](#)  
[SCYLORHINIDAE](#)  
[SPHYRNIDAE](#)  
[SQUALIDAE](#)  
[SQUATINIDAE](#)  
[STEGOSTOMATIDAE](#)  
[TRIAKIDAE](#)

#### **LOBSTERS**

[Technical terms and principal measurements used](#)



[General remarks](#)  
[Guide to families occurring in the area](#)  
[List of species occurring in the area](#)  
[NEPHROPIDAE](#)  
[PALINURIDAE](#)  
[SCYLLARIDAE](#)  
[SYNAXIDAE](#)

## **SHRIMPS - PRAWNS**

[Important note for users](#)  
[Technical terms](#)  
[General remarks](#)  
[List of families occurring in the area](#)  
[ALPHEIDAE](#)  
[ARISTEIDAE](#)  
[HIPPOLYTIDAE](#)  
[PALAEMONIDAE](#)  
[PANDALIDAE](#)  
[PENAEIDAE](#)  
[SERGESTIDAE](#)  
[SICYONIIDAE](#)  
[SOLENOCERIDAE](#)

## **SEA TURTLES**

[Technical terms and principal measurements used](#)  
[General remarks](#)  
[Guide to families and genera occurring in the area](#)  
[Picture guide to species occurring in the area](#)

## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

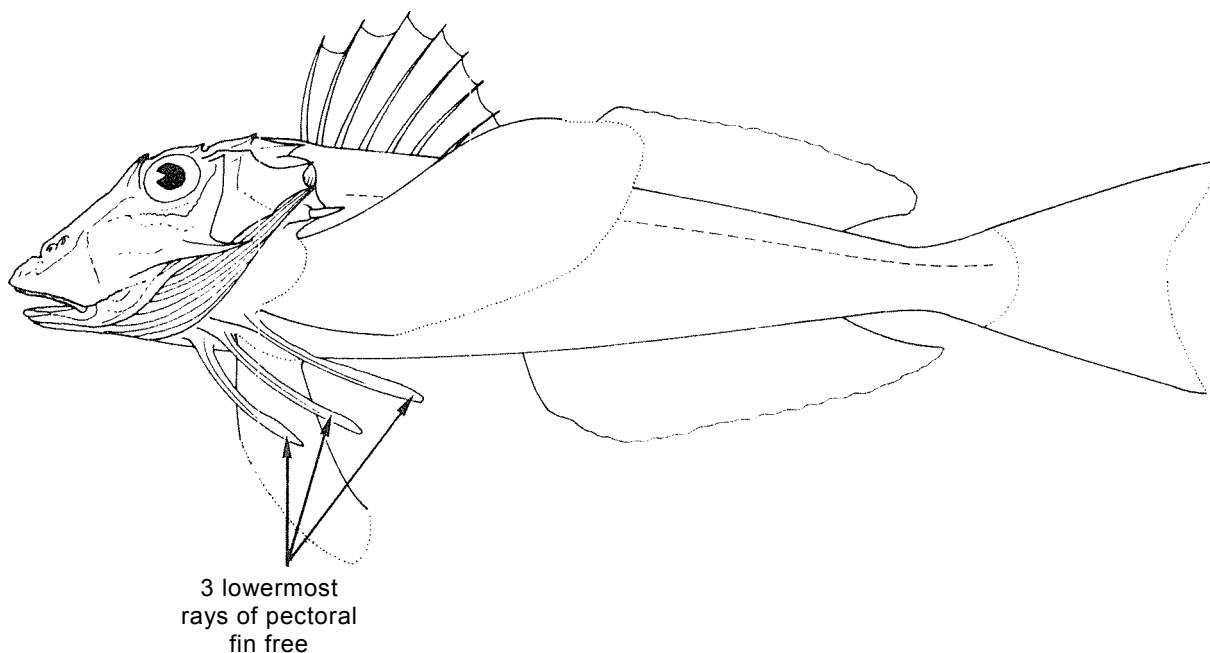
## TRIGLIDAE \*

## Gurnards and searobins

Body elongate. Head large, bony, with many ridges and spines but without barbels; snout usually ending in a pair of projections (rostral process), often armed with one or more pairs of short to moderate spines; mouth terminal to slightly inferior; villiform teeth present in both jaws. Two separate dorsal fins, the first with 8 to 11 spines, the second with 11 to 18 segmented soft rays; anal fin with 10 to 17 soft rays; pectoral fins short to long, with 3 lowermost rays free detached from the remaining fin rays. Body with scales, but lacking bony scutes. Swimbladder bilobed in most species.

Colour: variable, silver or red to black or dusky, belly always pale; juveniles usually with dark saddles on body; first dorsal fin often with a black spot or blotch; pectoral fins usually with some bands, spots or blotches.

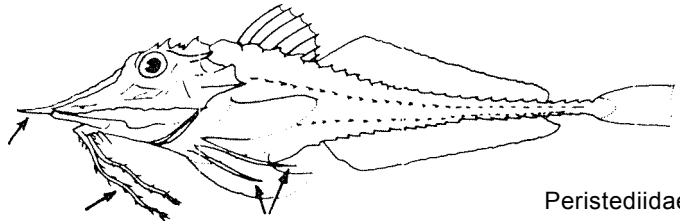
Searobins are medium-sized benthic fishes (to about 45 cm in total length) inhabiting the continental and insular shelves of tropical, and warm temperate seas to depths of about 200 m. They occur on sandy or muddy substrates, rubble or reef-type bottom, using the free rays of their pectoral fins for support and for search of food. Although most species are not the object of a special fishery, they often enter bottom-trawl catches. The majority of the species are considered as trashfish, but some of the larger ones are used as food. Their flesh is tasty and firm.



\* Diagnosis applies to Western Indian Ocean species only

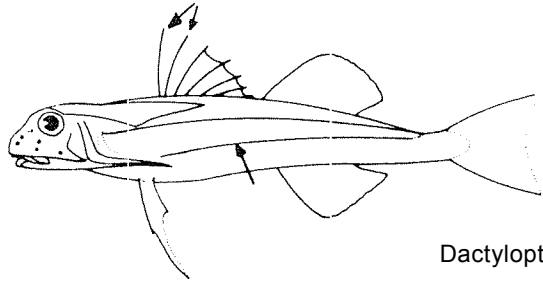
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Peristediidae: snout flattened, flanked laterally by a pair of short or long projections; mouth inferior, teeth absent; mandibular, lip and chin barbels always present; only the 2 lowermost rays of pectoral fins free (the 3 lowermost rays free in Triglidae); body scaleless but enclosed by 4 rows of spinous scutes on each side.



Peristediidae

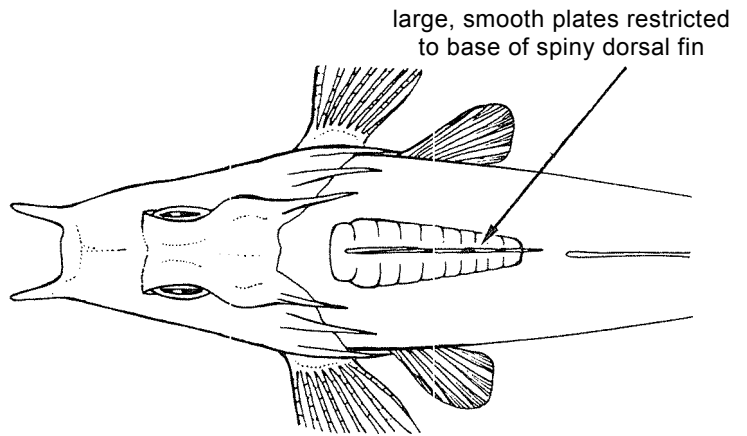
Dactylopteridae: anterior two dorsal fin spines separated from remainder of fin; pectoral fins without any free rays.



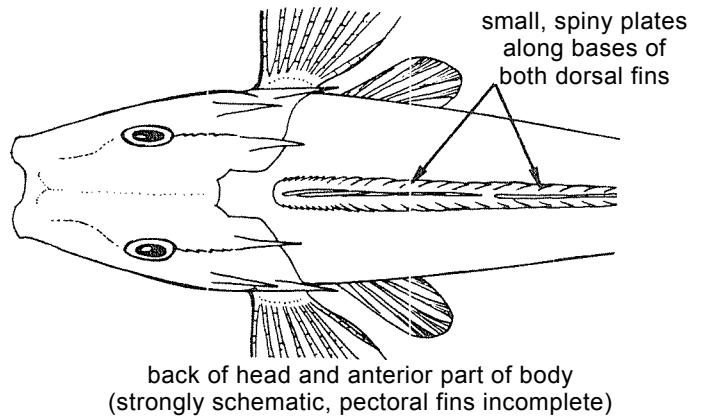
Dactylopteridae

**KEY TO GENERA OCCURRING IN THE AREA:**

- 1a. Bases of first dorsal fin spines expanded into broad, flattened, bony plates; no spines or plates along base of second dorsal fin (Fig.1) ..... Pterygotrigla
- 1b. Bases of first and second dorsal fin spines with small plates bearing strong lateral spines (Fig.2)

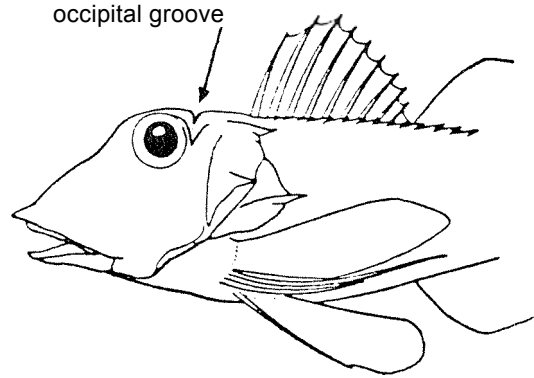


Pterygotrigla Fig.1



Lepidotrigla and Chelodinichthys Fig.2

- 2a. Head with a deep occipital groove (fissure across top of head behind eyes, Fig.3); body scales large, usually less than 60 along lateral line ..... Lepidotrigla
- 2b. Head without deep occipital groove; body scales small, usually more than 60 along lateral line ..... Chelidonichthys



Lepidotrigla Fig.3

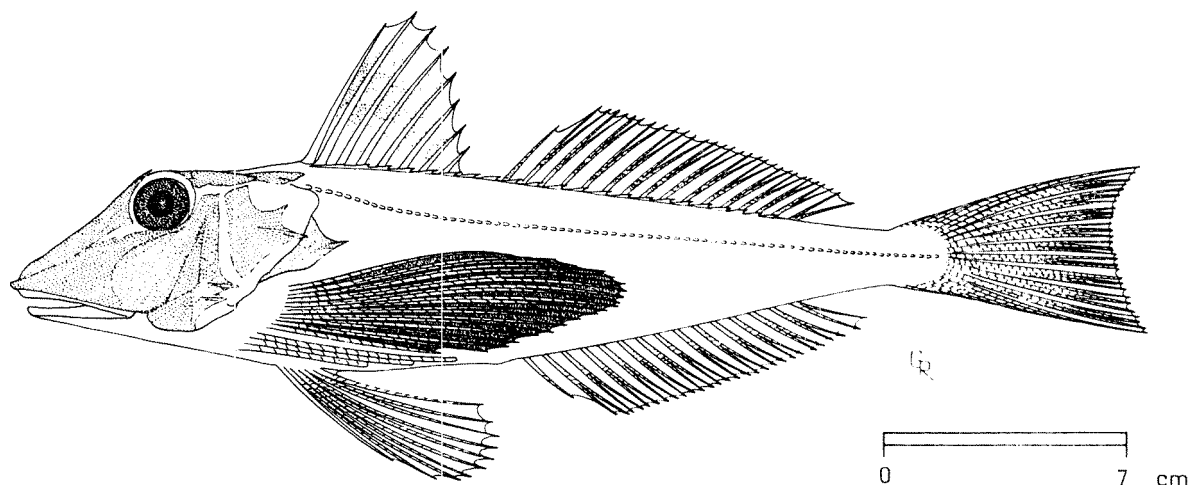
**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

<u>Chelidonichthys capensis</u> (Cuvier in Cuv. & Val., 1829)	TRIGL Chel 1
<u>Chelidonichthys lastoviza</u> (Bonnaterre, 1788)	TRIGL Chel 4
<u>Chelidonichthys kumu</u> (Lesson, 1830)	TRIGL Chel 7
<u>Chelidonichthys queketti</u> Regan, 1904	TRIGL Chel 8
<u>Lepidotrigla alcocki</u> Regan, 1908	TRIGL Lepid 4
<u>Lepidotrigla bentuviai</u> Richards & Saksena, 1977	TRIGL Lepid 5
<u>Lepidotrigla bispinosa</u> Steindachner, 1898	TRIGL Lepid 6
<u>Lepidotrigla faueri</u> Gilchrist & Thompson, 1914	TRIGL Lepid 7
<u>Lepidotrigla multispinosus</u> Smith, 1934	TRIGL Lepid 8
<u>Lepidotrigla omanensis</u> Regan, 1905	TRIGL Lepid 9
<u>Lepidotrigla riggsi</u> Richards & Saksena, 1977	TRIGL Lepid 10
<u>Lepidotrigla spiloptera</u> Gunther, 1880	TRIGL Lepid 11
<u>Pterygotrigla guezei</u> Fourmanoir & Guézé, 1963	TRIGL Pter 1
<u>Pterygotrigla hemisticta</u> (Temminck & Schlegel, 1842)	TRIGL Pter 2

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)Chelidonichthys capensis (Cuvier in Cuv. & Val., 1829)OTHER SCIENTIFIC NAMES STILL IN USE: Trigla capensis Cuvier in Cuv. & Val., 1829

## VERNACULAR NAMES:

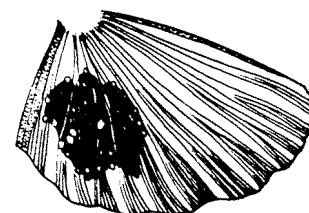
FAO :       En - Cape gurnard  
               Fr - Grondin du Cap  
               Sp - Rubio del Cabo

NATIONAL:

## DISTINCTIVE CHARACTERS:

Head large, triangular, bony, with many ridges and spines, but without a fissure on top of head behind eyes (occipital groove); eye small, its diameter less than interorbital width; gillrakers on first arch 15 to 19. Soft dorsal fin rays 15 or 16; bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales small, 65 to 80 along lateral line; breast without scales.

Colour: reddish above, pale below, with a dark patch surrounded by white spots on the inner surface of dark green pectoral fin.

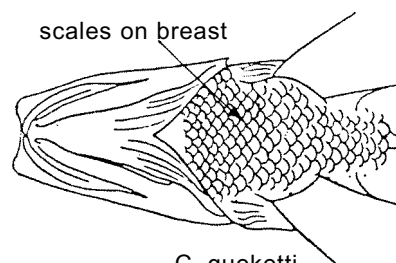


right pectoral fin bent  
forward showing  
inner surface

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Chelidonichthys kumu: gillrakers on first arch 8 or 9 (15 to 19 in C. capensis); eye diameter greater than interorbital width.

Chelidonichthys queketti: scales present on breast.

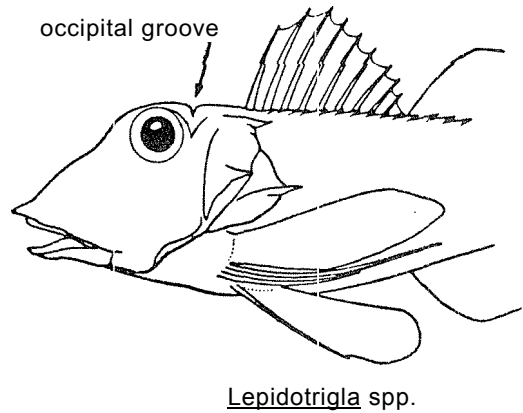
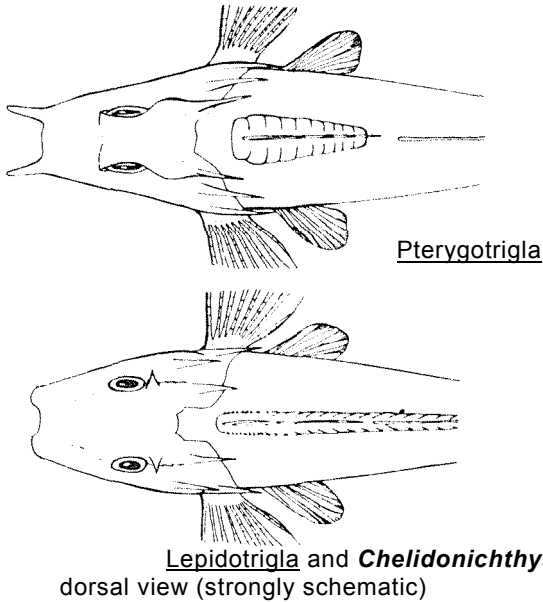
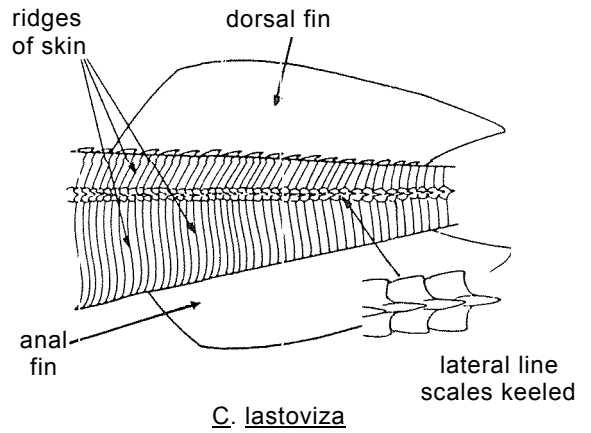


C. queketti  
underside of head and breast

Chelidonichthys lastoviza: lateral line scales enlarged and keeled and body covered with distinct, transverse ridges of skin.

Lepidotrigla species: scales large, fewer than 60 in lateral line (70 to 80 in lateral line in C. capensis); a occipital groove present.

Pterygotrigla species: bases of first dorsal fin spines expanded into broad, flattened, bony plates; no spines or plates along base of second dorsal fin.



**SIZE:**

Maximum: about 75 cm; common to 35 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

A temperate sub-tropical species confined to the southern coast of Africa, from Walfish Bay (west coast of Africa) to the southern border of Mozambique.

Inhabits sand and mud

Feeds chiefly on crustaceans, especially crabs.

**PRESENT FISHING GROUNDS:**

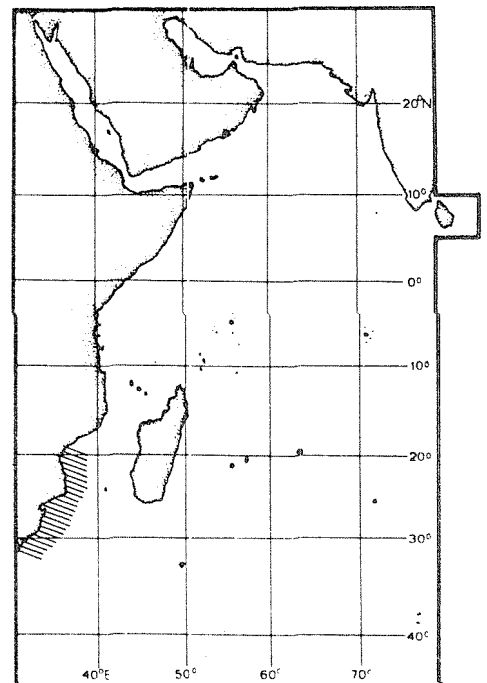
Trawling grounds off southern Africa. Locally rather abundant.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Taken mainly in trawls.

Reported to be an excellent food fish. Utilized mostly fresh.



FAO SPECIES IDENTIFICATION SHEETS

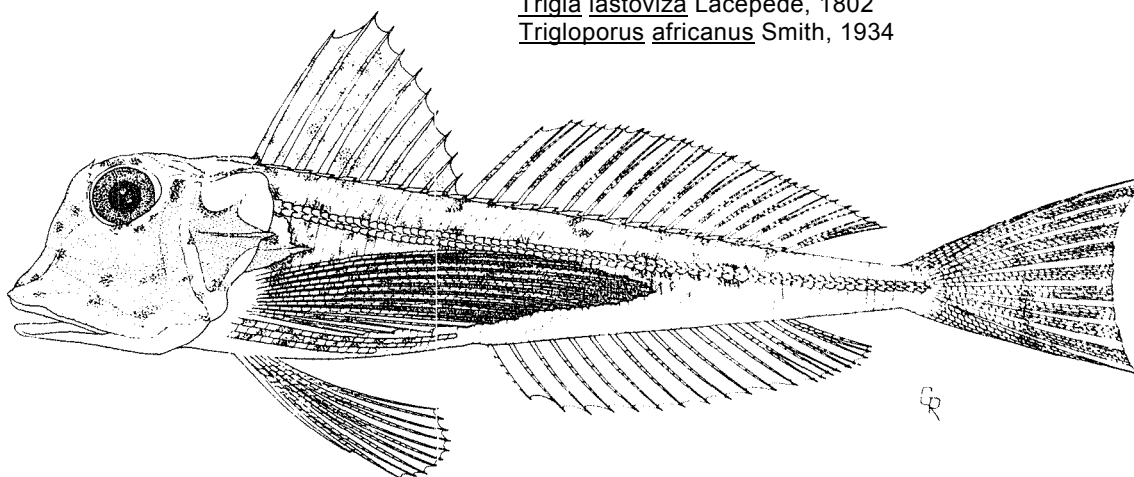
FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)

Chelidonichthys (Trigloporus) lastoviza (Bonnaterre, 1788)\*

OTHER SCIENTIFIC NAMES STILL IN USE:

- Trigloporus lastoviza (Bonnaterre, 1788)
- Trigla lastoviza Bonnaterre, 1788
- Trigla lineata Gmelin, 1789
- Trigla adriatica Gmelin 1789
- Trigla lastoviza Lacepède, 1802
- Trigloporus africanus Smith, 1934



VERNACULAR NAMES:

- FAO : En - Streaked gurnard
- Fr - Grondin camard (= Rouget camard, Area 37)
- Sp - Rubio

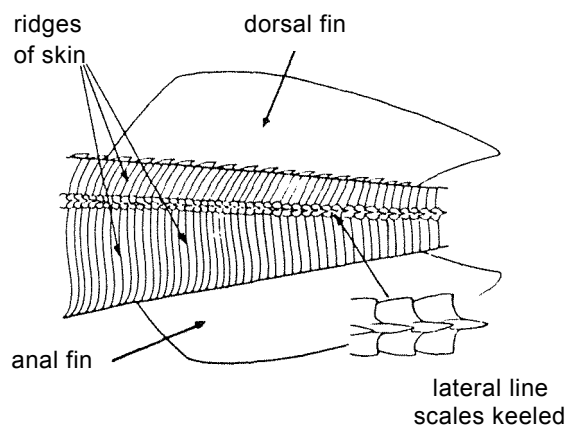


NATIONAL:

DISTINCTIVE CHARACTERS:

Head large, triangular, bony, with many ridges and spines, but without a deep occipital groove; gillrakers on first arch 4 to 8. Two separate dorsal fins, the first with 9 to 11 spines, the second with 15 to 17 segmented soft rays. Lateral-line scales enlarged and keeled, armed with small spines. Body covered with distinct, transverse ridges of skin originating at the lateral line. Breast variably naked to fully scaled, belly fully scaled.

Colour: red above, pale below with dark spots or blotches on head and back; pectoral fins greyish with large, dark blue spots.




---

Many current workers use Trigloporus africanus

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of Triglidae: no transverse ridges or grooves on sides of body.

## SIZE:

Maximum: about 40 cm; common to 20 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Found along the east African coast from southern Africa northward to Mozambique. This is the most widely dispersed gurnard of the Eastern Atlantic, ranging northward to Norway and into the Mediterranean and southward to the Cape of Good Hope.

Inhabits rocky or sandy bottoms near reefs, from the shoreline to about 150 m depth.

## PRESENT FISHING GROUNDS:

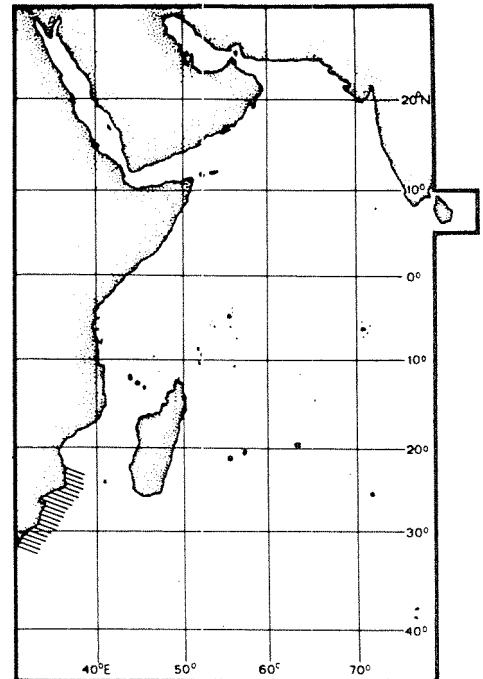
Continental shelf throughout its range.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Taken in bottom trawls.

An excellent food fish; used mostly fresh and smoked; also reduced to fishmeal and oil by offshore fleets.





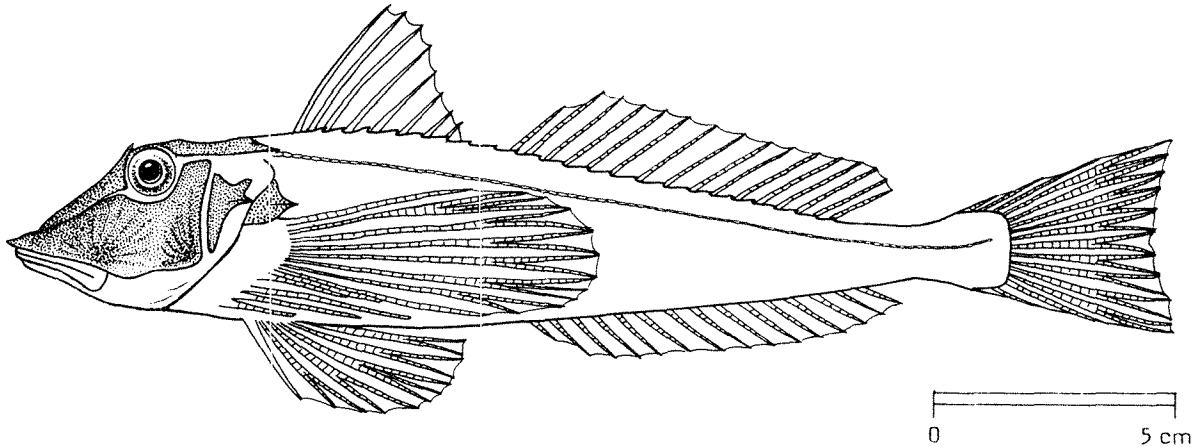
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)

Chelidonichthys kumu (Lesson, 1830)

OTHER SCIENTIFIC NAMES STILL IN USE: Trigla kumu Lesson, 1830



**VERNACULAR NAMES:**

- FAO :           En - Bluefin gurnard  
                  Fr - Grondin aile bleu:  
                  Sp - Testolln de aleta azul

NATIONAL:

**DISTINCTIVE CHARACTERS:**

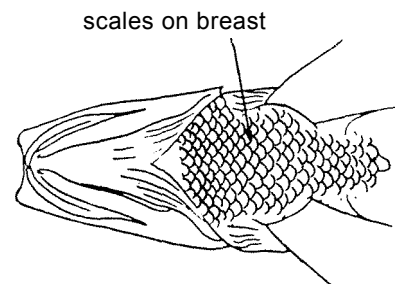
Head large, triangular, with many ridges and spines, but without a fissure on top of head behind eyes (occipital groove); eye diameter greater than interorbital width; gillrakers on first arch 8 or 9. Soft dorsal and anal fin rays 15 or 16; bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales small, 70 to 80 along lateral line; breast without scales.

Colour: olive to red, silvery below.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Chelidonichthys capensis: eye diameter smaller than interorbital width; gillrakers on first arch 15 to 19 (8 or 9 in C. kumu).

Chelidonichthys queketti: scales present on breast.

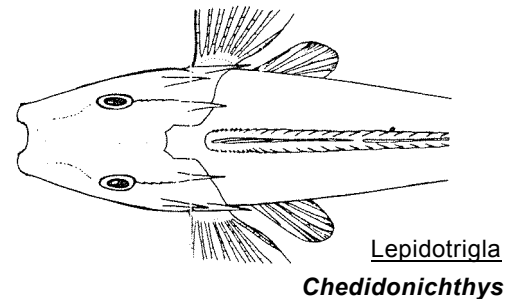
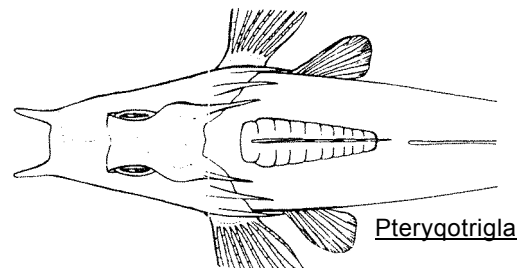
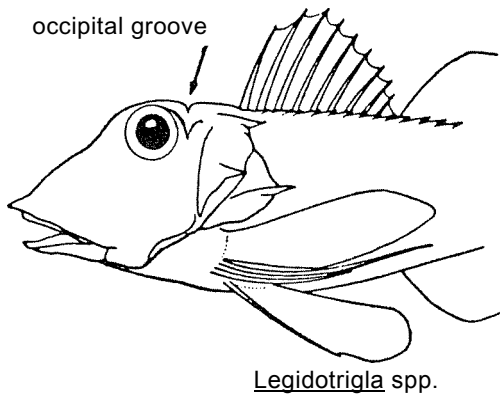
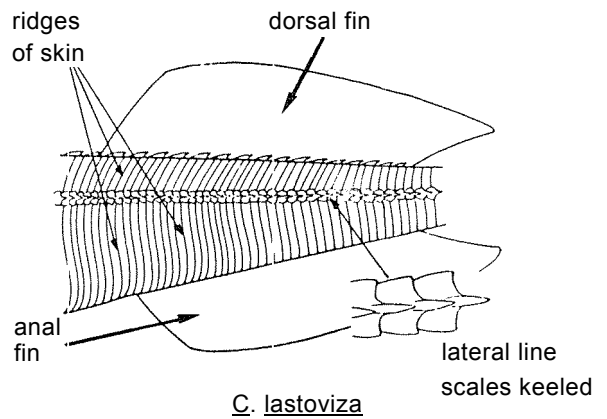


C. queketti  
underside of head and breast

Chelidonichthys lastoviza: lateral line scales enlarged and keeled; body covered with distinct, transverse ridges of skin.

Lepidotrigla species: scales larger, fewer than 60 in lateral line (70 to 80 in C. kumu); and an occipital groove present.

Pterygotrigla species: bases of first dorsal fin spines expanded into broad, flattened, bony plates; no spines or plates along base of second dorsal fin.



**SIZE:**

Maximum:40 cm; common to 25 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

A tropical and subtropical species ranging from South Africa and southern Mozambique across the Indian and Pacific Oceans to Chile, the Hawaiian Islands and Japan. The subpopulations recognized so far may be different species.

Occurrence in this area based on museum specimens, from Cape of Good Hope to Maputo in 90 to 200 m.

**PRESENT FISHING GROUNDS:**

Trawling grounds off southern Africa.

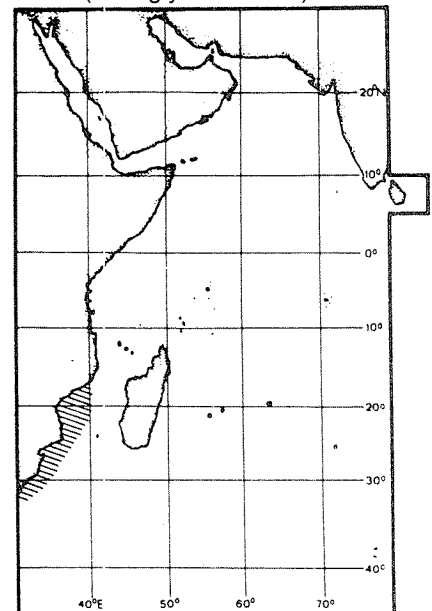
**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Taken mainly in trawls.

Reported to be an excellent food fish.

dorsal view (strongly schematic)



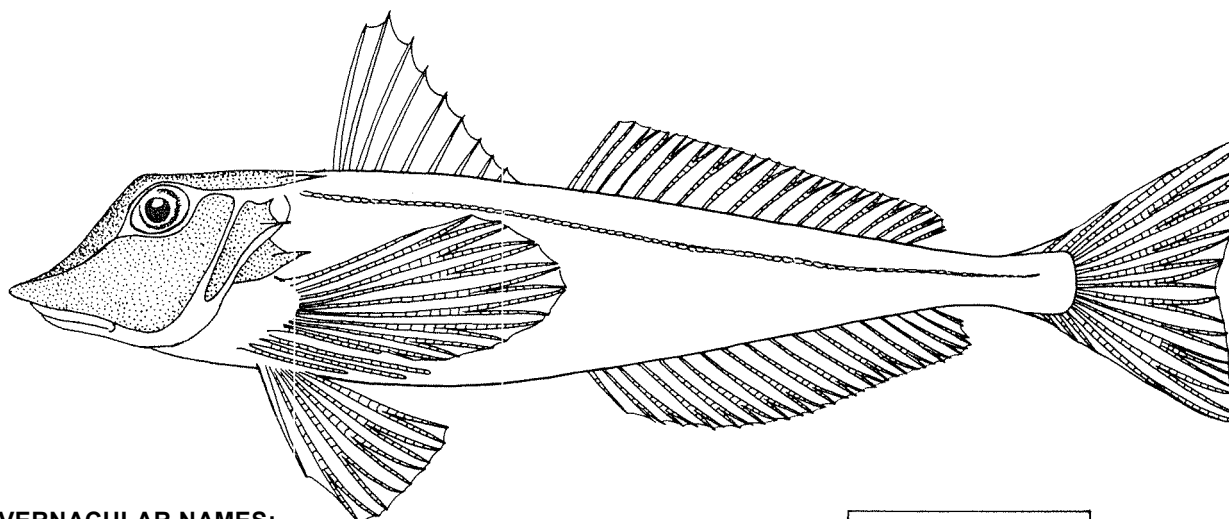
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)

Chelidonichthys queketti (Regan, 1904)

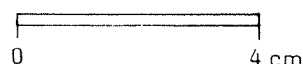
OTHER SCIENTIFIC NAMES STILL IN USE : Trigla queketti Regan, 1904



VERNACULAR NAMES:

- FAO : En - Lesser South African gurnard
- Fr - Grondin du Natal
- Sp - Testolin de Natal

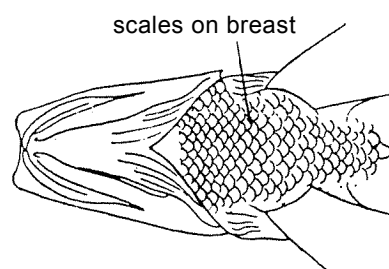
NATIONAL:



DISTINCTIVE CHARACTERS:

Head large, triangular, bony with many ridges and spines, but without a fissure on top of head behind eyes (occipital groove); gillrakers on first arch 10 or 11. Soft dorsal and anal fin rays 17 to 19; bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales small, 65 to 80 along lateral line; breast with scales.

Colour: back olive, first dorsal and anal fins red; second dorsal golden; sides and belly pink and yellow.

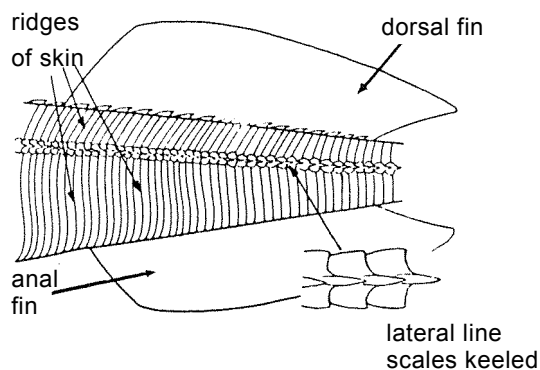


underside of head and breast

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Chelidonichthys kumu and C. capensis; scales on breast absent.

Chelidonichthys lastoviza: lateral line scales enlarged and keeled and body covered with distinct, transverse, ridges of skin.



C. lastoviza

Lepidotrigla species: scales large, fewer than 60 in lateral line (65 to 80 in C. queketti); an occipital groove present.

Pterygotrigla species: bases of first dorsal fin spines expanded into broad, flattened bony plates; no spines or plates along base of second dorsal fin.

**SIZE:**

Maximum: 30 cm; common to 20 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

A temperate subtropical species confined to the coast of South Africa, northward to southern Mozambique.

**PRESENT FISHING GROUNDS:**

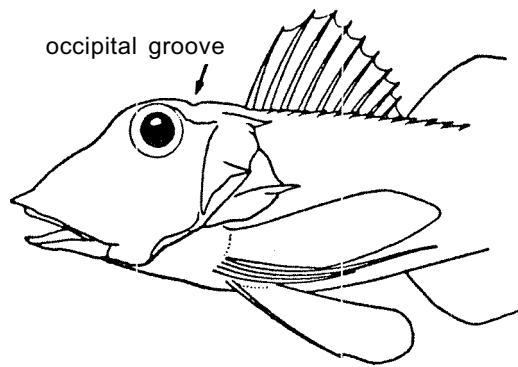
Trawling grounds off southern Africa; size not large enough to be of significant commercial importance.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

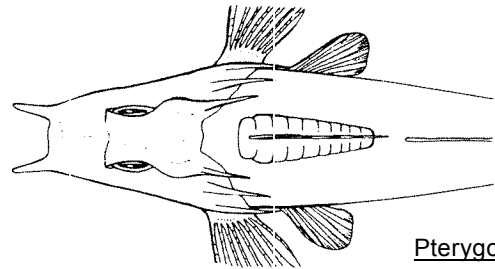
Separate statistics are not reported for this species.

Taken mainly in trawls.

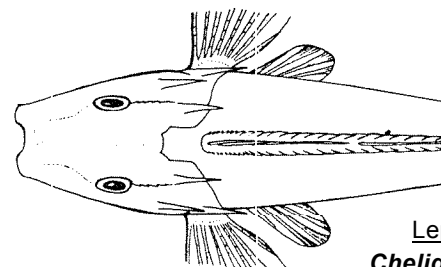
Reported to be an excellent food fish; utilized mostly fresh.



Lepidotrigla spp.

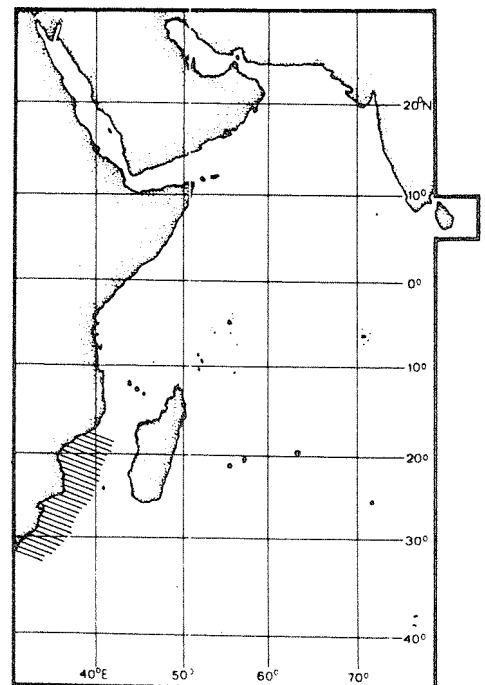


Pterygotrigla



Lepidotrigla  
**Chelidonichthys**

dorsal view (strongly schematic)

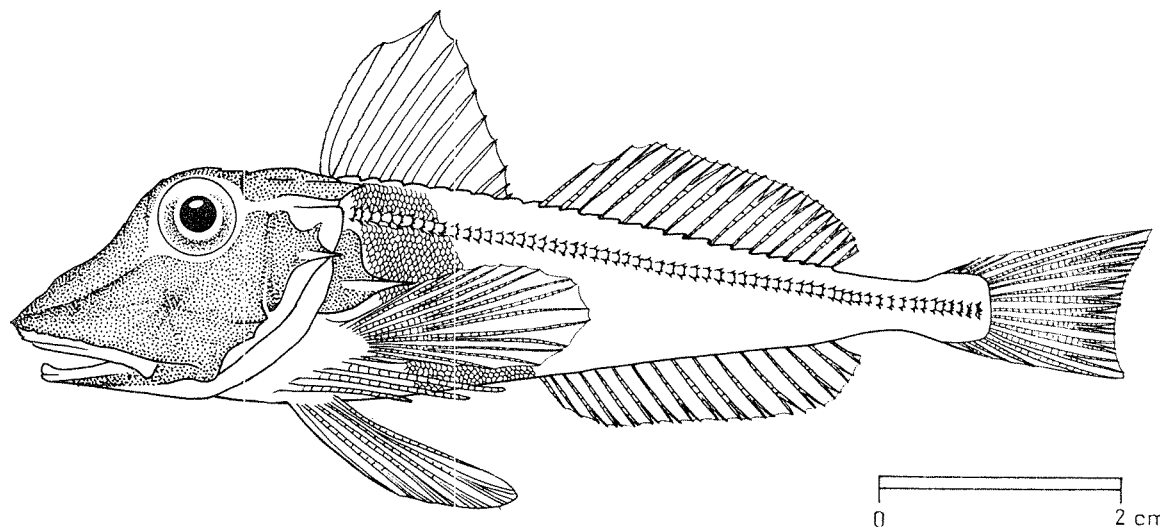


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)Lepidotrigla alcocki Regan, 1908

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO: En - Alcock's gurnard  
Fr - Grondin de Soya  
Sp - Cabete de Soya

NATIONAL:

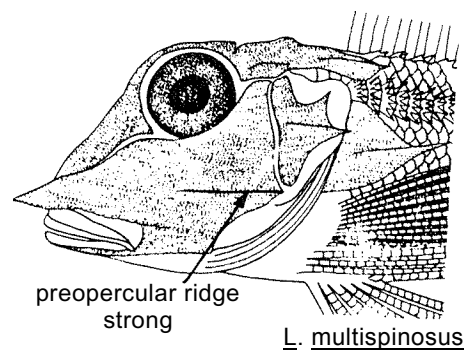
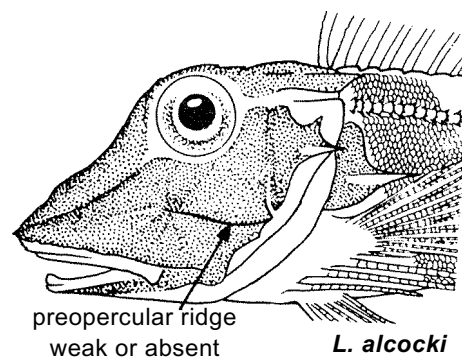
## DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, and a fissure on top, behind eyes (occipital groove); rostral process forming a curved projection with no prominent spines; preopercular ridge weak or absent. Bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales large, fewer than 70 in lateral line.

Colour: mostly red.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Lepidotrigla multispinosus: preopercular ridge strong.



Other Lepidotrigla species: rostral process projecting as a single pair of blade-like spines or several prominent spines.

Chelidonichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla species: broad, flattened body plates at base of dorsal fin, but no plates or spines along base of second dorsal fin.

**SIZE:**

Maximum: small, 12.8 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Known only from the two types of specimens collected in the Western Indian Ocean at the Saya de Malha Bank at 225 m depth.

**PRESENT FISHING GROUNDS:**

No special fishery.

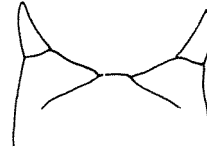
**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

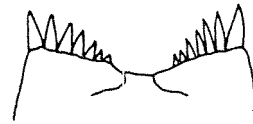
Probably taken as bycatch with bottom trawls.



Chelidonichthys



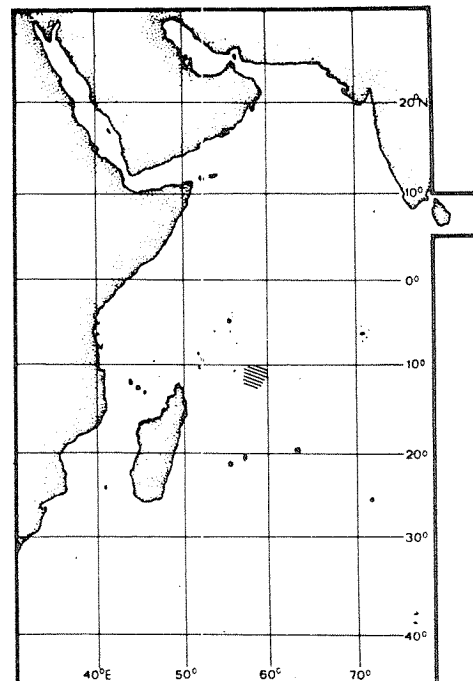
L. bispinosa



L. skiloptera



**L. alcocki**  
rostral process (dorsal view)



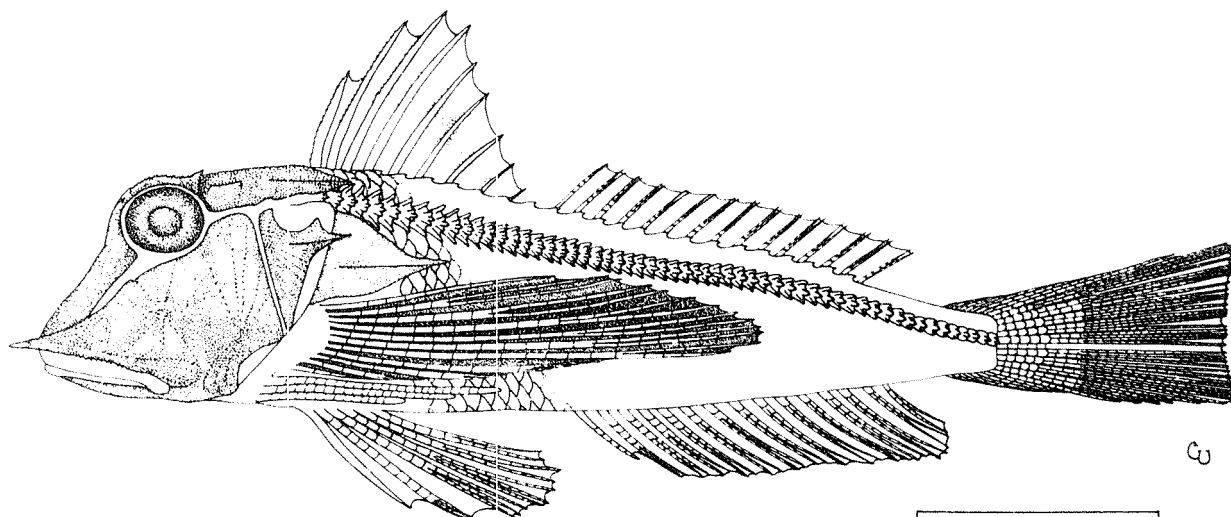
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)

Lepidotriglai bentuviai Richards & Saksena, 1977

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

- FAO : En - Twohorn gurnard
- Fr - Grondin cornu
- Sp - Cabete de dos cuernos

NATIONAL:

DISTINCTIVE CHARACTERS:

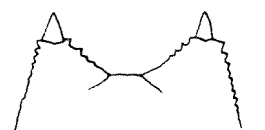
Head large, triangular, with many ridges and spines, and a fissure on top behind eyes (occipital groove); rostral process with a single pair of prominent, blade-like spines which is much longer than the other rostral spines. Bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales large, fewer than 70 in lateral line; belly not fully scaled.

Colour: mostly red.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Lepidotrigla omanensis, L. bispinosa and L. riggsi: belly fully scaled.

Other Lepidotrigla species: rostral process either with more than one pair of prominent spines, the largest not much larger than the other spines; or forming a pair of curved projections without prominent spines.



**L. bentuviai**



L. alcocki



L. spiloptera

rostral process  
(dorsal view)

Chelidonichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla species: broad, flattened, bony plates at base of dorsal fin, but no plates or spines along base of second dorsal fin.

**SIZE:**

Maximum: small, 12 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Known from two localities of the Cape Guardafui coast in an area commonly referred to as the Horn of Africa, off Somalia, on the south side of the entrance to the Gulf of Aden.

Specimens collected at depths ranging from 25 to 49 m.

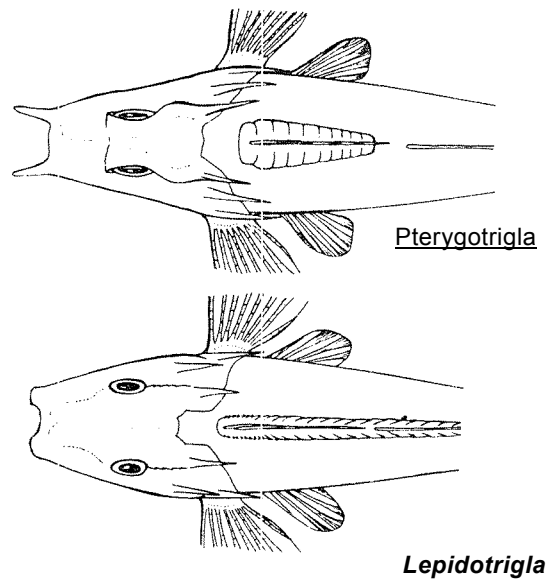
**PRESENT FISHING GROUNDS:**

No fishery; probably taken incidentally as bycatch in trawling operations.

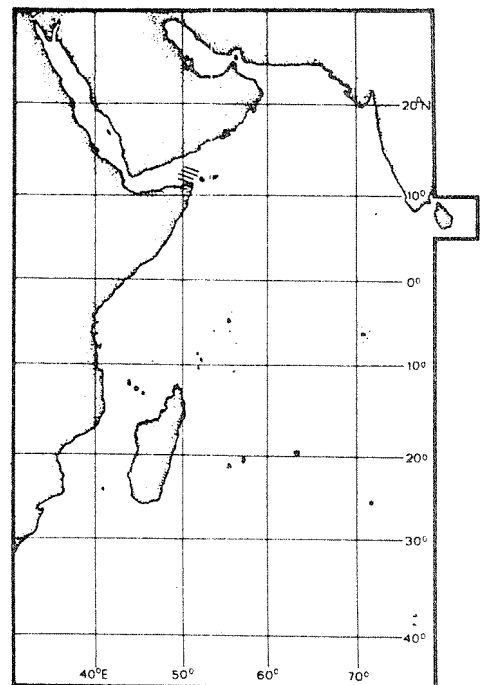
**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Probably taken in trawls.



dorsal view (strongly schematic)





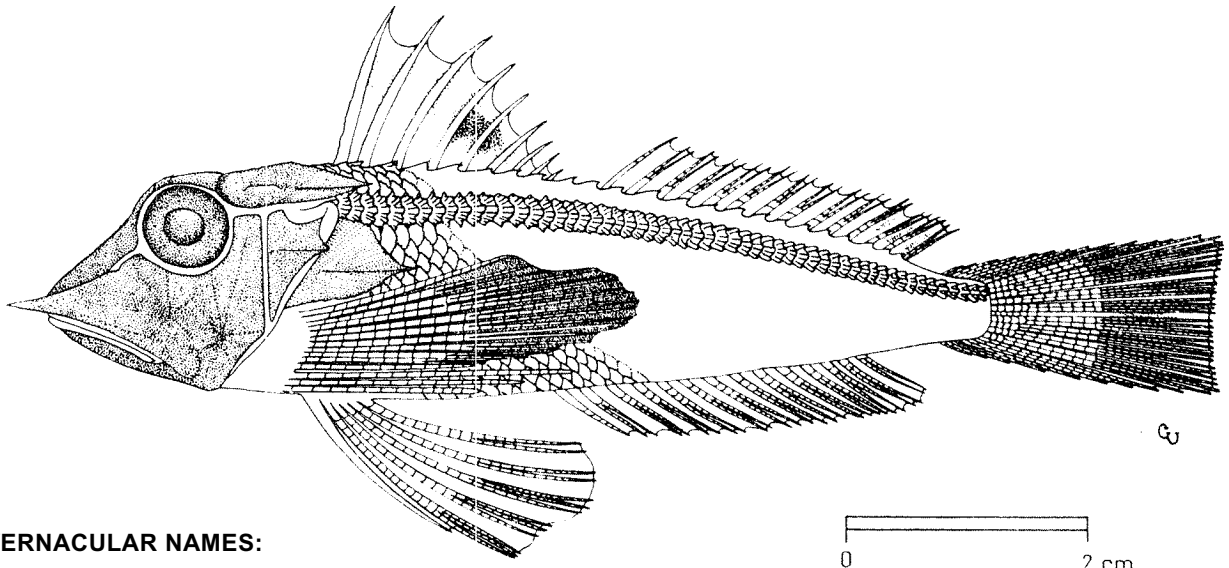
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)

Lepidotrigla bispinosa (Steindachner, 1898)

OTHER SCIENTIFIC NAMES STILL IN USE : incorrectly synonymized with Lepidotrigla omanensis



VERNACULAR NAMES:

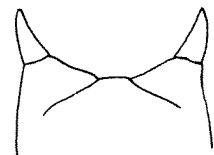
- FAO : En - Bullhorn gurnard
- Fr - Grondin taureeu
- Sp - Cabete toro

NATIONAL:

DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, and a fissure on top behind eyes (occipital groove); head length 31.5 to 41.7% of standard length; interorbital width 4.8 to 8.2% of standard length; rostral process with a single pair of prominent, blade-like spines. Bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales large, fewer than 70 in lateral line; scales firmly attached, in every distinct rows; belly fully scaled; 15 to 19 (usually 18) scale rows below lateral line.

Colour: mostly red, with belly and lower flanks light or white.



rostral process  
(dorsal view)

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Lepidotrigla omanensis: 10 to 14 (usually 12) scale rows below lateral line 15 to 19 in L. bispinosa); inter-orbital width 7.3 to 9.8% of standard length; head length 38.2 to 43.1% of standard length (4.8 to 8.2 and 31.5 to 41.7%, respectively, in L. bispinosa).

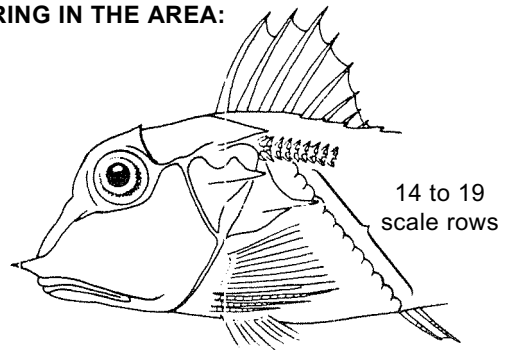
L. bentuviai: belly not fully scaled.

L. riggsi: scales loosely attached in uneven, indistinct rows.

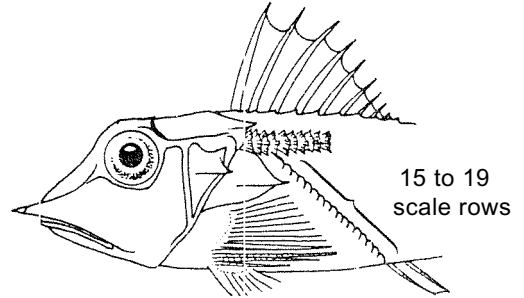
Other Lepidotrigla species: rostral process either with more than one pair of prominent spines, the largest not much larger than the other spines, or forming a pair of curved projections without prominent spines.

Chelidonicichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla: broad, flattened, bony plates present at base of first dorsal fin, but no plates or spines along base of second dorsal fin.

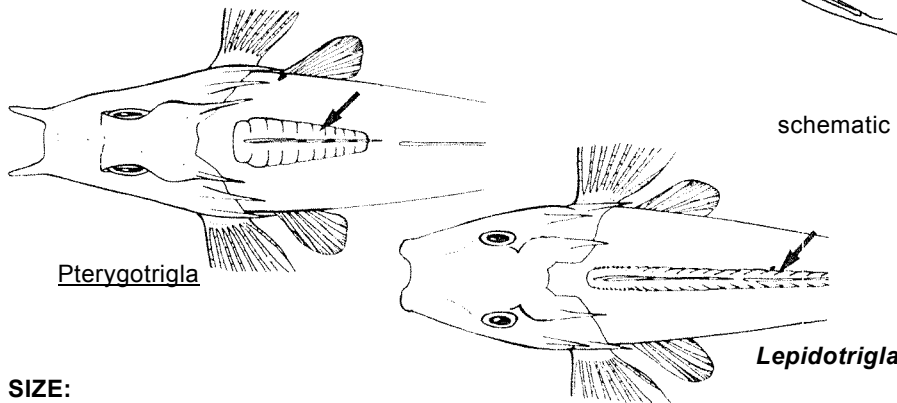


L. omanensis



**L. bispinosa**

schematic (pectoral and pelvic fins incomplete)



**SIZE:**

Maximum: 16 cm.

dorsal view (strongly schematic)

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Red Sea, eastward along the coast of Oman, in the "Gulf", and along the north coast of the Arabian Sea in Iran, Pakistan and northern India.

Found at depths between 9 and 115 m.

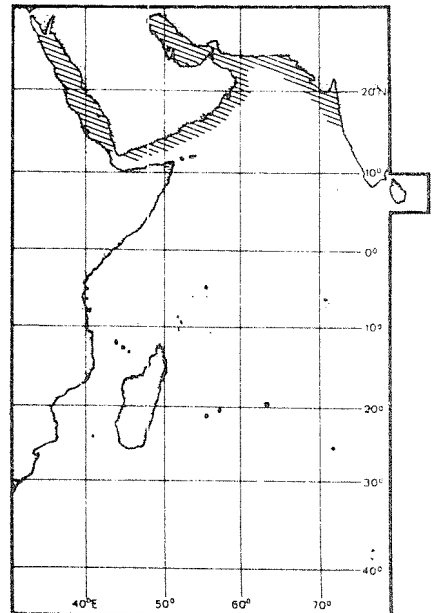
**PRESENT FISHING GROUNDS:**

No special fishery; taken as bycatch in trawling operations.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with bottom trawls.

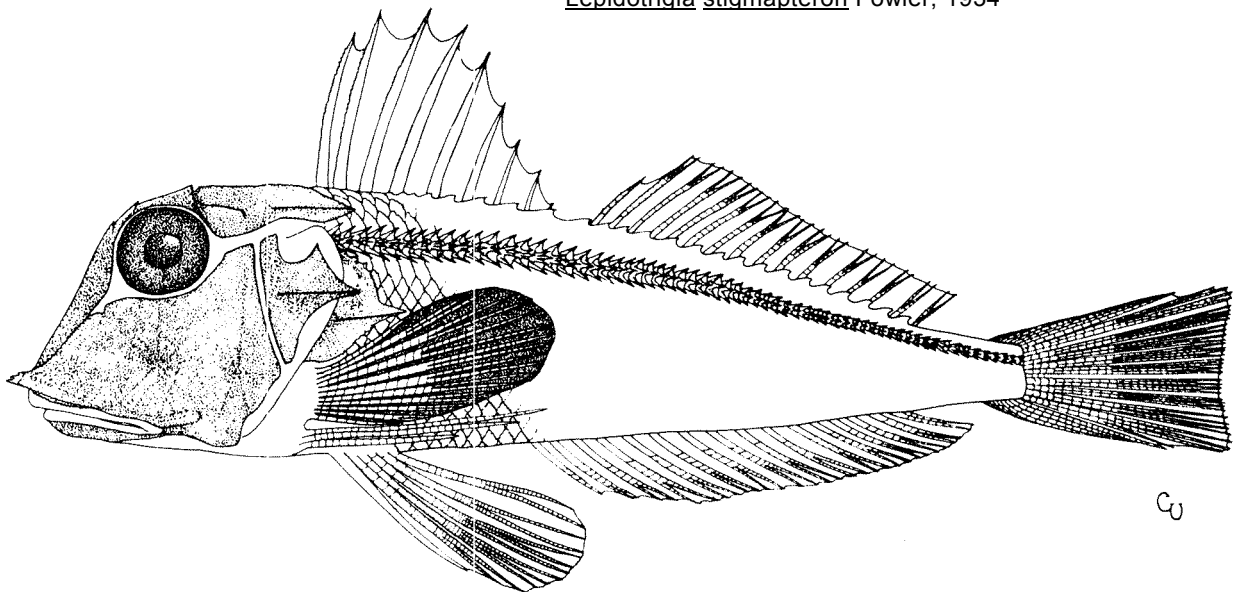


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

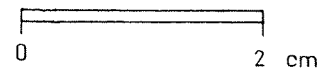
FISHING AREA 51  
(W. Indian Ocean)Lepidotrigla faueri Gilchrist & Thompson, 1914

## OTHER SCIENTIFIC NAMES STILL IN USE:

Lepidotrigla natalensis Gilchrist & Thompson, 1914Lepidotrigla stigmapteron Fowler, 1934

## VERNACULAR NAMES:

FAO : En - Scalybreast gurnard  
Fr - Grondin armure  
Sp - Cabete escamudo

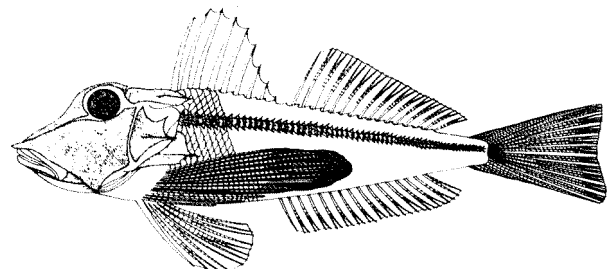


NATIONAL:

## DISTINCTIVE CHARACTERS:

Head, large, triangular, with many ridges and spines, and a fissure on top, behind eyes (occipital groove); rostral process with several prominent spines. Bases of first and second dorsal fins with small plates bearing strong lateral spines; pectoral fin variable in length, ranging from 31.2 to 47% of standard length (fin shortest at southern end of range becoming progressively longer in Arabian Sea populations). Body scales large, fewer than 70 in lateral line; scale rows below lateral line 12 to 16.

Colour: mostly red.



form of long pectoral fin

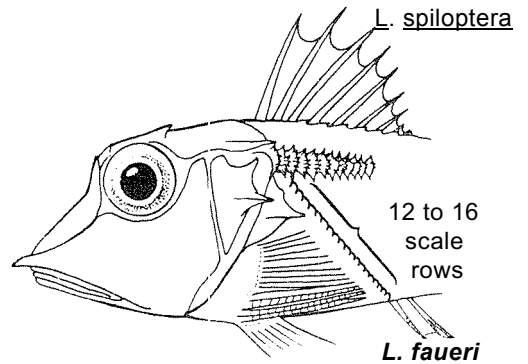
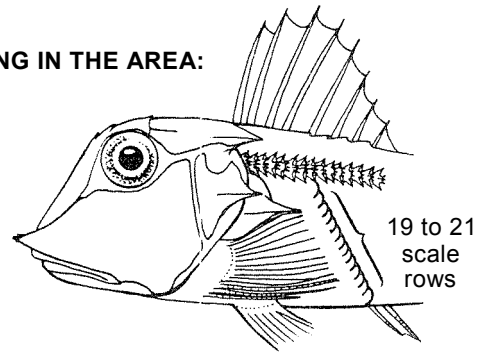
**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Lepidotrigla spiloptera: scales smaller, 19 to 21 scale rows below lateral line (12 to 16 in L. faueri).

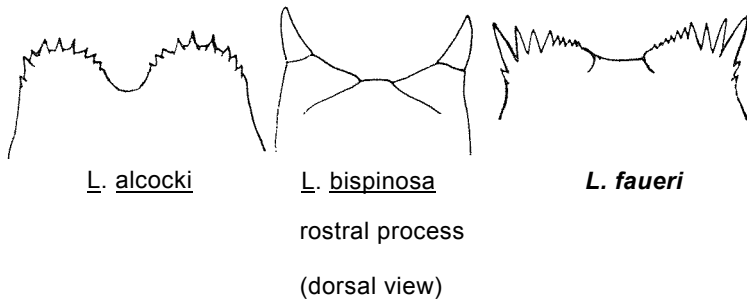
Other Lepidotrigla species: rostral process either a pair of curved projections with no prominent spines, or with a single pair of prominent, blade-like spines much larger than the others.

Chelidonichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla species: broad, flattened bony plates at base of dorsal fin, but no plates or spines along base of second dorsal fin.



schematic (pectoral and pelvic fins incomplete)



**SIZE:**

Maximum: small, 14 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

From the area of Durban, South Africa, northward along the coast of Africa, to the Arabian Sea coast of Oman, Pakistan and India. It has not been found in the Red Sea or the "Gulf".

Found at depths between 50 and 175 m.

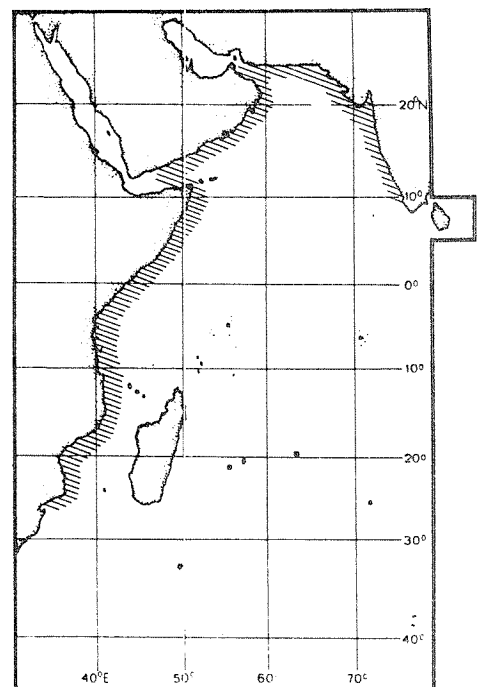
**PRESENT FISHING GROUNDS:**

No special fishery.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Probably taken as bycatch in bottom trawls.

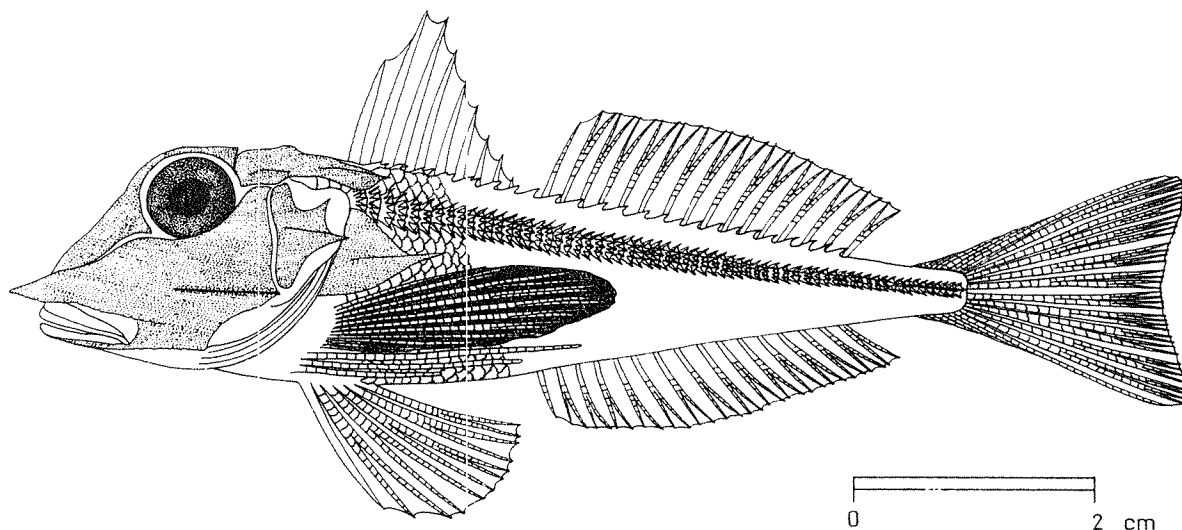


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)Lepidotrigla multispinosus Smith, 1934

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :       En - Spiny gurnard  
              Fr - Grondin épineux  
              Sp - Cabete espinudo

NATIONAL:

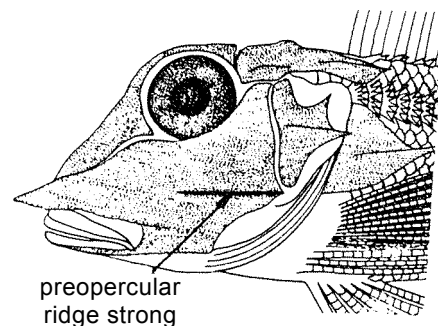
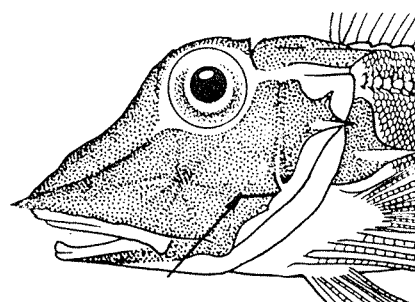
## DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, and a fissure on top, behind eyes (occipital groove); rostral process forming a curved projection with no prominent spines; preopercular ridge strong. Bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales large, fewer than 70 in lateral line.

Colour: mostly red.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Lepidotrigla alcocki: preopercular ridge weak or absent.

*L. multispinosus*preopercular ridge  
weak or absent*L. alcocki*

Other Lepidotrigla species: rostral process projecting as a single pair of blade-like spines or several prominent spines.

Chelidonichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla species: broad, flattened bony plates at base of dorsal fin, but no plates or spines along base of second dorsal fin.

**SIZE:**

Maximum: small, 14 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Along the coast of East Africa and Kenya southward to Mozambique.

Found at depths between 230 and 295 m.

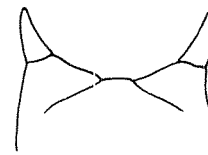
**PRESENT FISHING GROUNDS:**

No special fishery.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Probably taken as bycatch with bottom trawls.



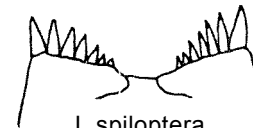
L. bispinosa



L. alcocki

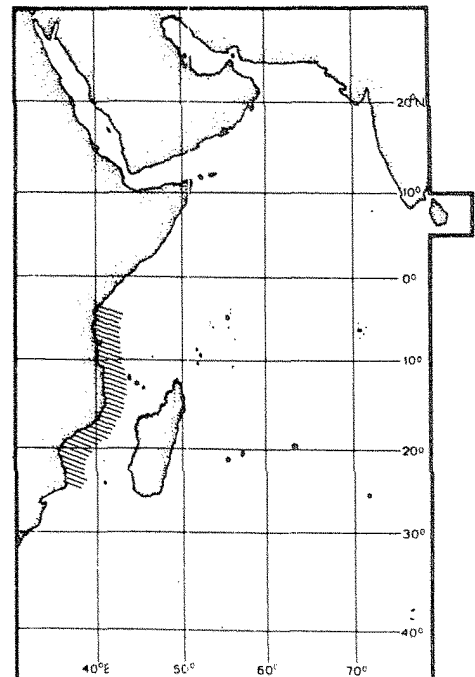


***L. multispinosus***



L. spiloptera

rostral process  
(dorsal view)



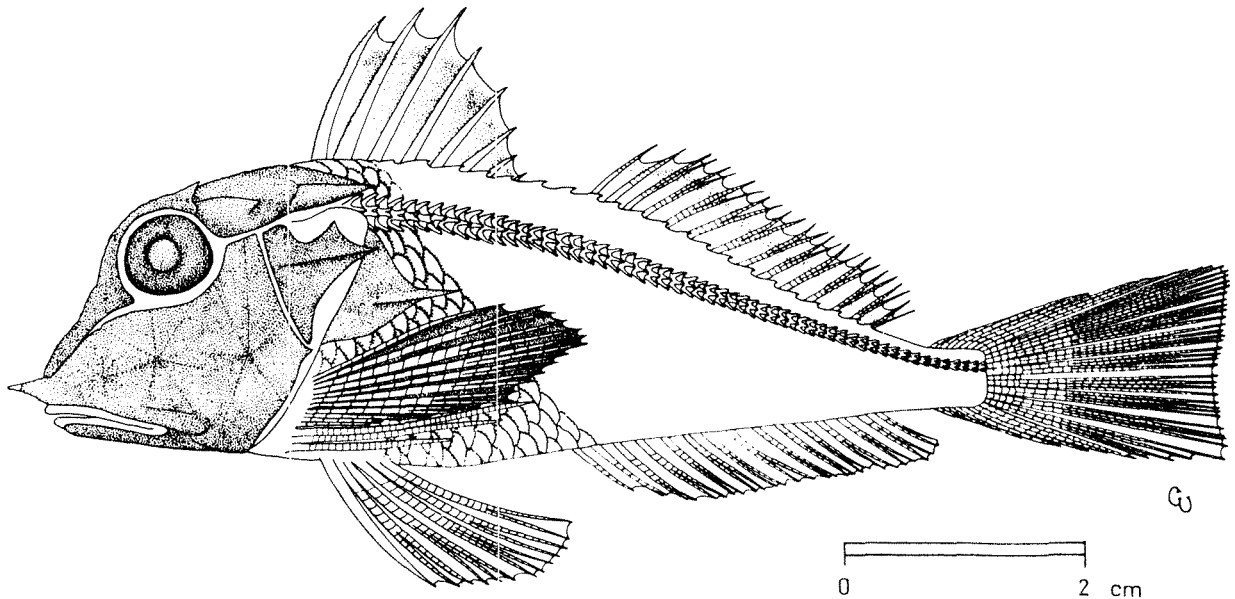
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Lepidotrigla omanensis* Regan, 1905

OTHER SCIENTIFIC NAMES STILL IN USE : incorrectly synonymized with *Lepidotrigla bispinosa*



VERNACULAR NAMES:

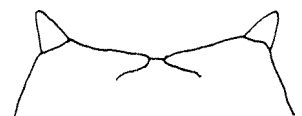
- FAO: En - Oman gurnard
- Fr - Grondin d'Oman
- Sp - Cabete de Ornân

NATIONAL:

DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, and a fissure on top behind eyes (occipital groove); head length 38.2 to 43.1% of standard length; interorbital width 7.3 to 8.9% of standard length; rostral process with a single pair of prominent, blade like spines. Bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales large, fewer than 70 in lateral line; scales firmly attached, in even, distinct rows; belly fully scaled; 10 to 14 (usually 12. scale rows below lateral line.

Colour: mostly red.



rostral process  
(dorsal view)

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Lepidotrigla bispinosa: 15 to 19 scale rows below the lateral line 10 to 14 in L. omanensis; interorbital width 4.8 to 8.2% of standard length, head length 31.5 to 41.7% of standard length (7.3 to 8.9 and 38.2 to 43.1%, respectively, in L. omanensis).

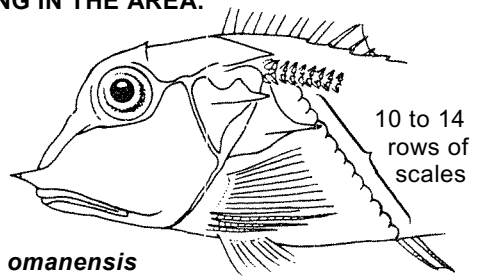
L. bentuviai: belly not fully scaled.

L. riggsi: scales loosely attached in uneven, indistinct rows.

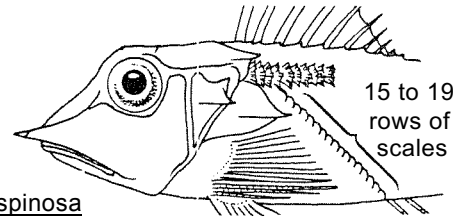
Other Lepidotrigla species: rostral process either with more than one pair of prominent spines, the largest not much larger than the other spines; or forming a pair of curved projections with no prominent spines.

Chelidonichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla: broad, flattened bony plates present at base of first dorsal fin, but no plates or spines along base of second dorsal fin.

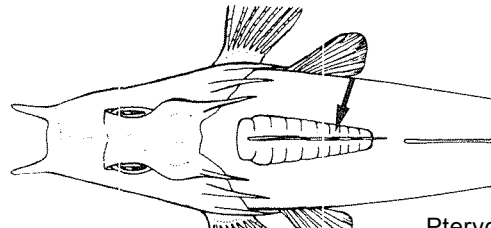


**L. omanensis**

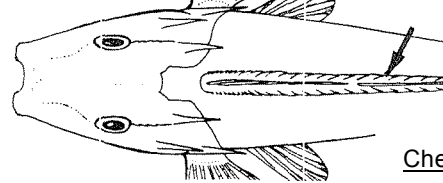


**L. bispinosa**

(schematic, pectoral and pelvic fins incomplete)



**Pterygotrigla**



**Chelidonichthys**

dorsal view (strongly schematic) **Lepidotrigla**

**SIZE:**

Maximum: small, 12.5 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Shores of the Arabian Sea from the mouth of the Red Sea to South India, but absent from the "Gulf" and Red Sea.

Found at depths between 56 to 220 m.

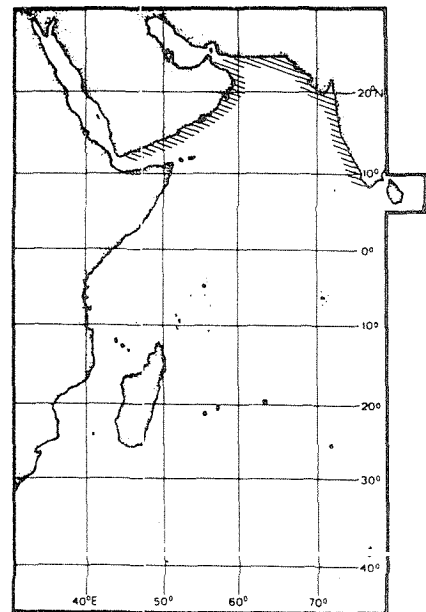
**PRESENT FISHING GROUNDS:**

No special fishery; taken as bycatch in trawling operations.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

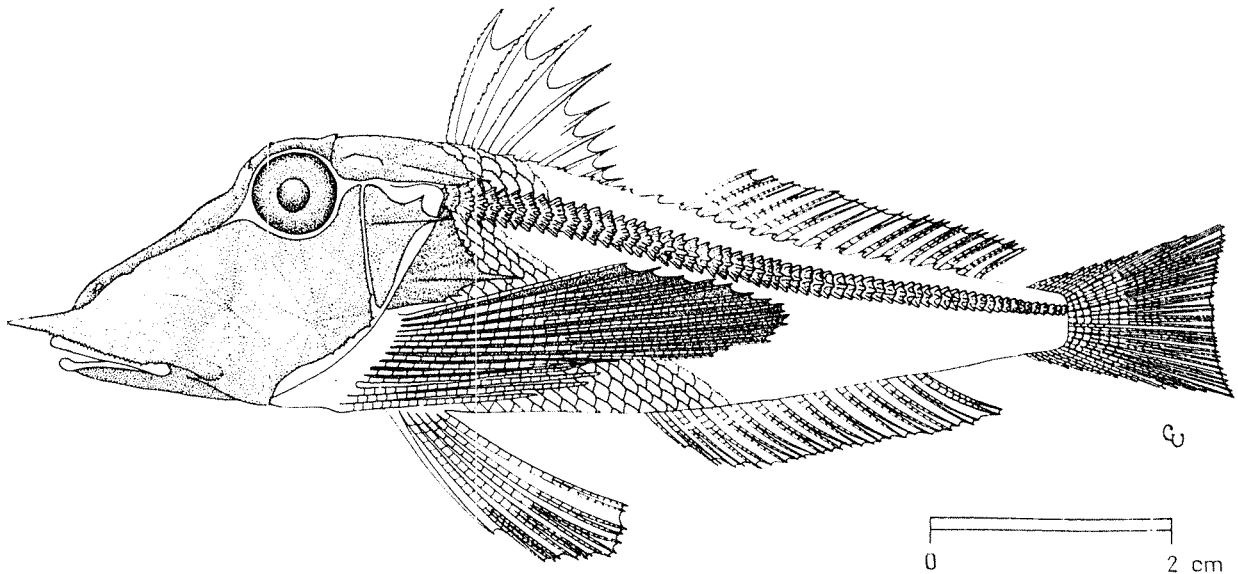
Caught mainly with bottom trawls.





## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)Lepidotrigla riggsi Richards & Saksena, 1977OTHER SCIENTIFIC NAMES STILL IN USE : Lepidotrigla longipinnis Alcock, 1890 (a name previously used in the genus)

## VERNACULAR NAMES:

FAO :           En - Rigg's gurnard  
                   Fr - Grondin grée  
                   Sp - Cabete aletón

NATIONAL:

## DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, and a fissure on top behind eyes (occipital groove); rostral process with a single pair of prominent, blade-like spines which is much longer than the other rostral spines. Bases of first and second dorsal fins with small plates bearing strong lateral spines. Body scales large, fewer than 70 in lateral line; belly fully scaled; scales very loosely attached, in uneven, indistinct rows.

Colour: mostly red.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

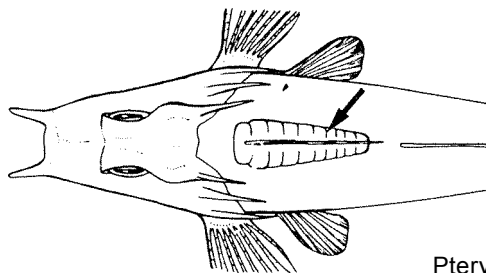
Lepidotrigla omanensis and L. bispinosa: scales firmly attached, in even distinct rows.

L. bentuviai: belly only partially scaled.

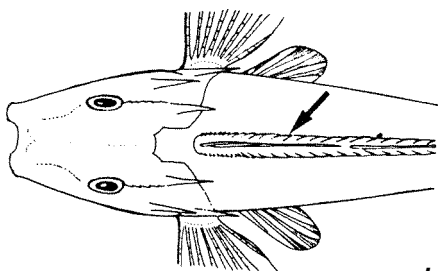
Other Lepidotrigla species: rostral process either with more than one pair of prominent spines, the largest not much larger than the other spines, or forming a pair of curved projections without prominent spines.

Chelidonichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla species: broad, flattened bony plates at base of dorsal fin, but no plates or spines along base of second dorsal fin.



Pterygotrigla

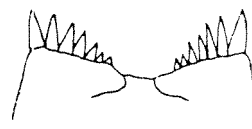


**Lepidotrigla**

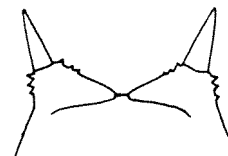
dorsal view (strongly schematic)



L. multispinosus



L. spiloptera



**L. riggsi**

rostral process  
(dorsal view)

**SIZE:**

Maximum: small, 12.5 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Known from a few localities along the coast of India and the Andaman Sea in depths of 90 to 96 m.

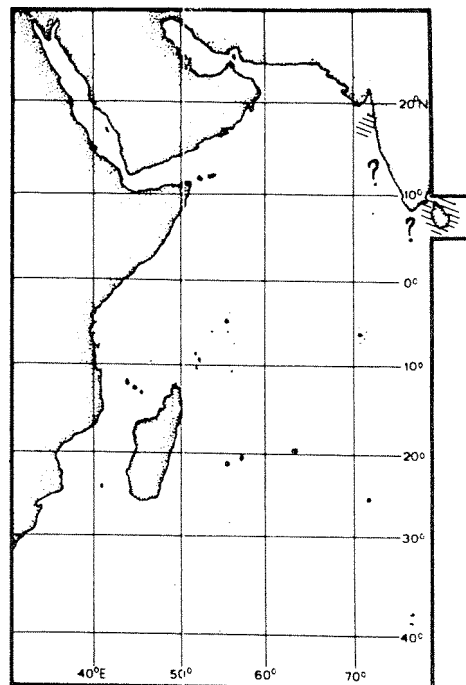
**PRESENT FISHING GROUNDS:**

No special fishery.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Probably taken in trawls as bycatch.

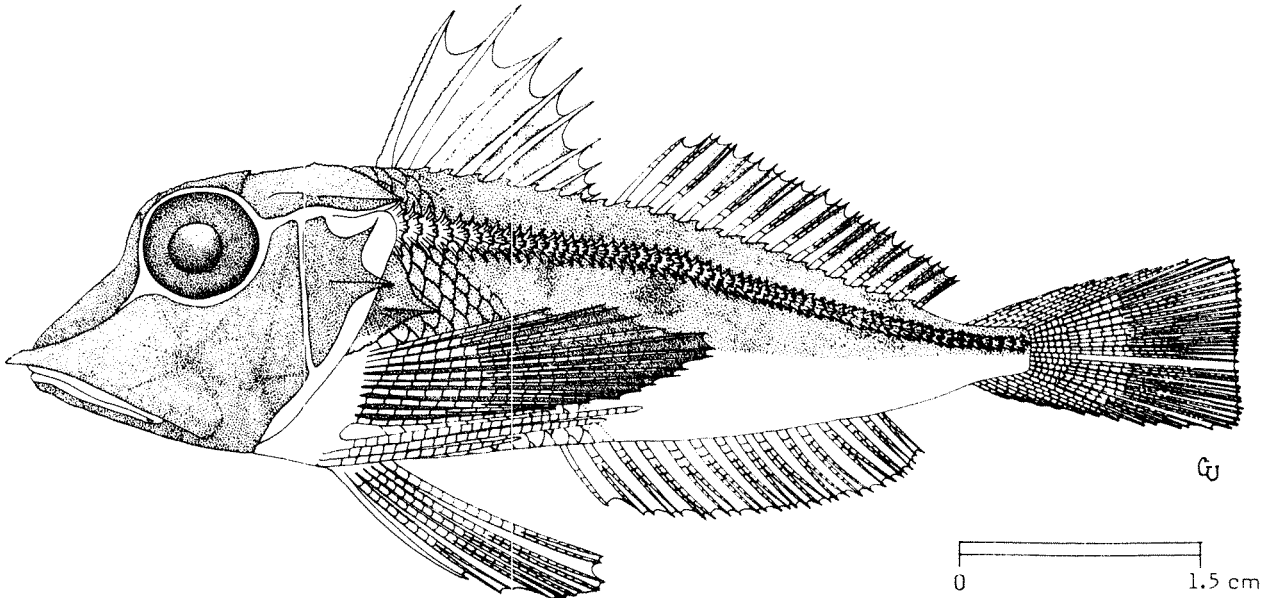


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)*Lepidotrigla spiloptera* Gunther, 1880

OTHER SCIENTIFIC NAMES STILL IN USE : None



## VERNACULAR NAMES:

FAO :           En - Spottedwing gurnard  
                  Fr - Grondin aile tacheté  
                  Sp - Cabete aleta

NATIONAL:

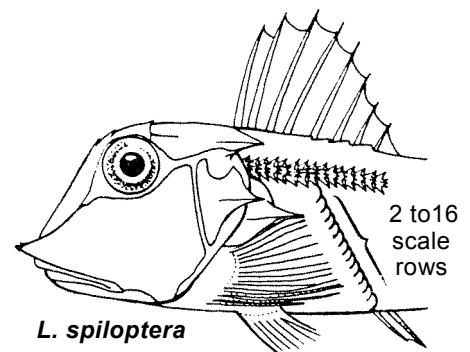
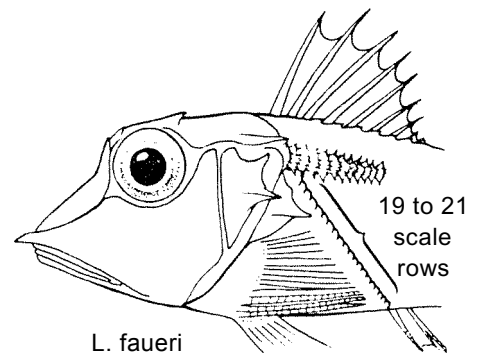
## DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, and a fissure on top, behind eyes (occipital groove); rostral process with several prominent spines. Bases of first and second dorsal fins with small plates bearing strong lateral spines. Bony scales large, fewer than 70 in lateral line; scale rows below lateral line 19 to 21.

Colour: mostly red with definite silvery white breast, belly and lower flanks.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

*Lepidotrigla faueri*: scales larger; 12 to 16 scale rows below lateral line (19 to 21 in *L. spiloptera*).



schematic (pectoral and pelvic fins incomplete)

Other Lepidotrigla species: rostral process either a pair of curved projections with no prominent spines, or with a single pair of prominent, blade-like spines much larger than the others.

Chelidonichthys species: no fissure or occipital groove behind eyes.

Pterygotrigla species: broad, flattened bony plates at base of dorsal fin, but no plates or spines along base of second dorsal fin.

**SIZE:**

Maximum: small, 10 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Sporadically distributed over a wide area, with museum specimens from Red Sea, Somalia coast and Zanzibar. Also known from the Bay of Bengal, Arafura Sea and the Philippines. Reports from Japan are based on a different species.

Found at depths between 76 and 256 m.

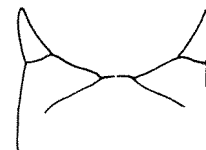
**PRESENT FISHING GROUNDS:**

No special fishery.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Probably taken as bycatch with bottom trawls.



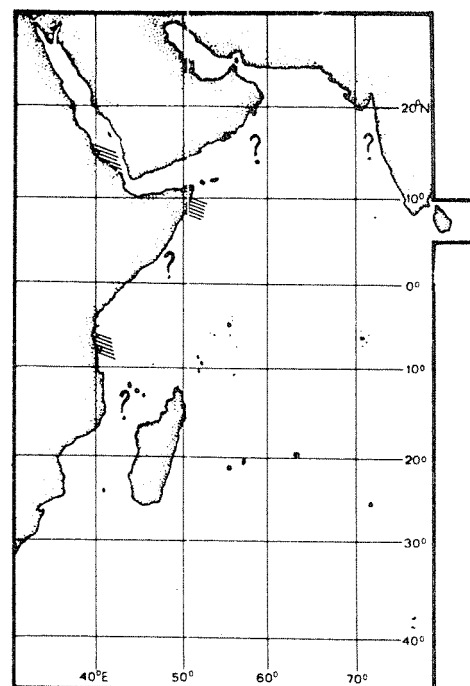
L. bispinosa



L. alcocki



***L. spiloptera***  
rostral process  
(dorsal view)

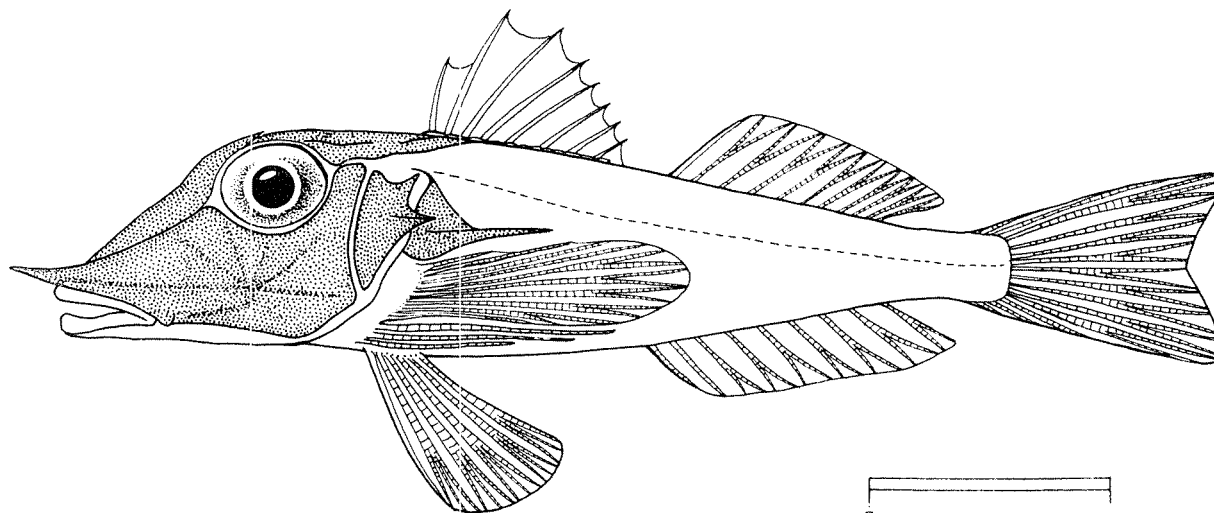


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)*Pterygotrigla guezei* Fourmanoir & Guézé, 1963

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Mauritius gurnard  
                  Fr - Grondin mauricien  
                  Sp - Cabete de Mauricio

NATIONAL:

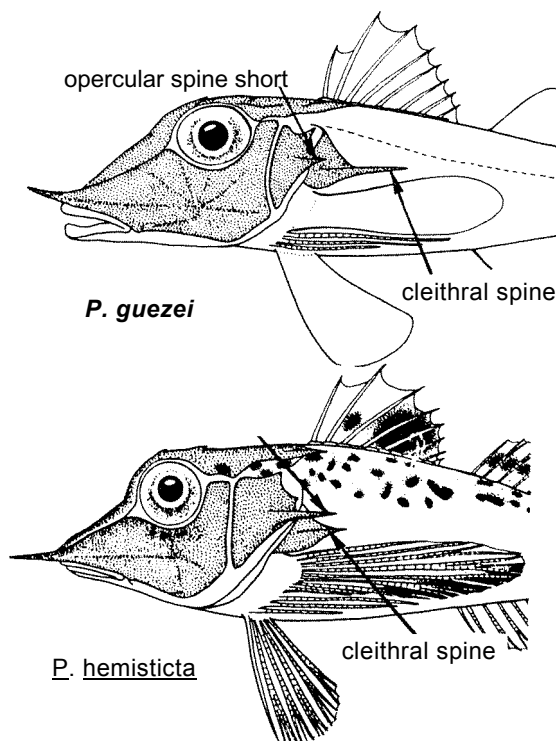
## DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, but without a fissure on top behind eyes (occipital groove); opercular spine short. Bases of first dorsal fin expanded into broad, flattened bony plates; no spines or plates along base of second dorsal fin.

Colour: probably reddish; without dark spots.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

*Pterygotrigla hemisticta*: opercular spine long; body with distinct dark spots.



Other species of Triglidae: small plates with strong lateral spines along base of both first and second dorsal fins.

**SIZE:**

Maximum: to at least 20 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Only known from one specimen from deep water (250 to 300 m) at Réunion Island and another specimen from Mauritius Island.

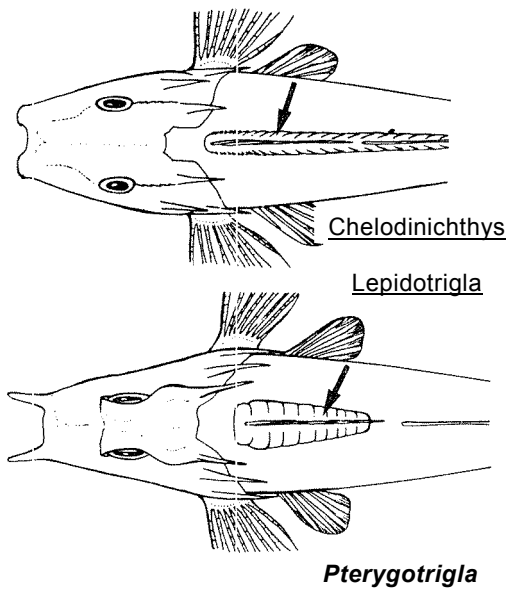
**PRESENT FISHING GROUNDS:**

Deep water around oceanic islands; no fishery at present, abundance unknown.

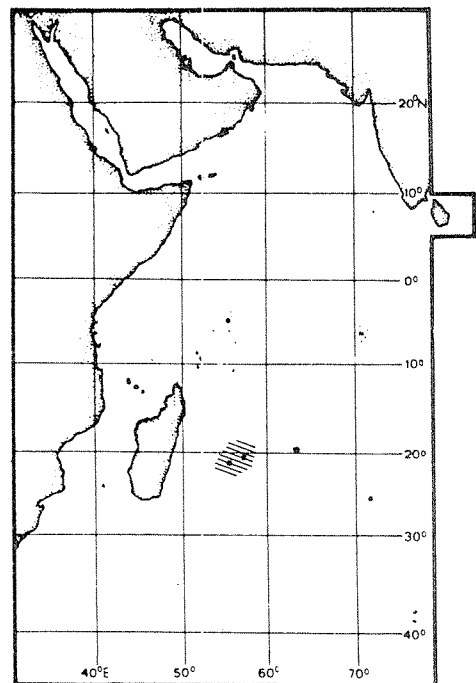
**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Taken rarely by hook and line in deep water.



dorsal view (strongly schematic)

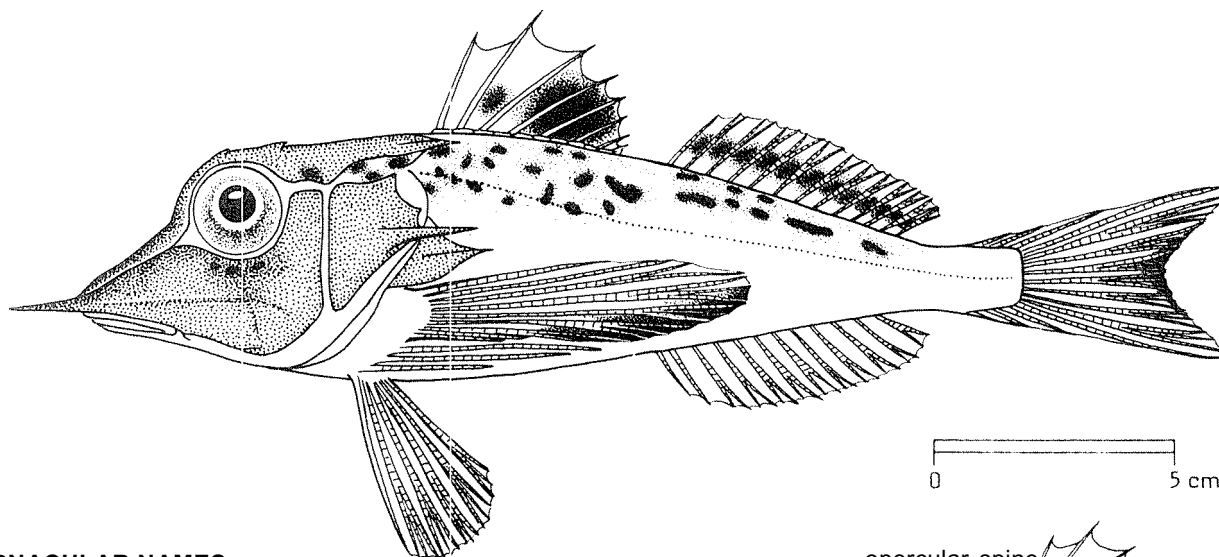


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIGLIDAE

FISHING AREA 51  
(W. Indian Ocean)Pterygotrigla hemisticta (Temminck & Schlegel, 1842)

OTHER SCIENTIFIC NAMES STILL IN USE: Otohime hemisticta (Temminck & Schlegel, 1842)  
Trigla arabica Boulenger, 1887  
Prionotus alepis Alcock, 1889



## VERNACULAR NAMES:

FAO : En - Blackspotted gurnard  
 Fr - Grondin encre  
 Sp - Cabete tintero

NATIONAL:

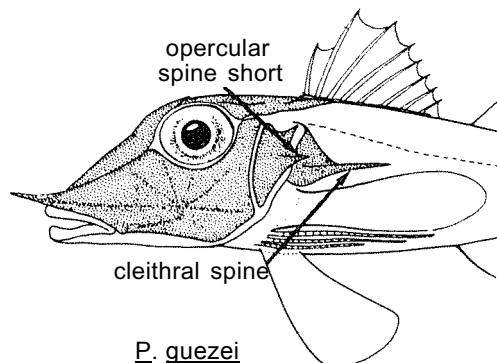
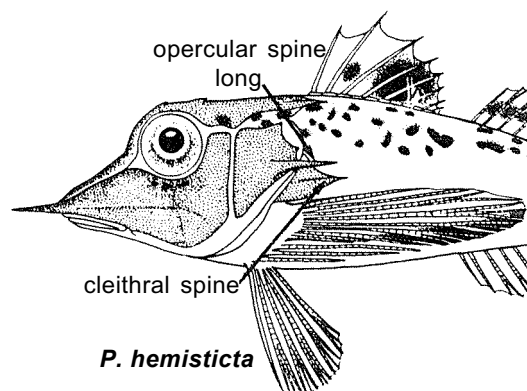
## DISTINCTIVE CHARACTERS:

Head large, triangular, with many ridges and spines, but. without a fissure on top behind eyes (occipital groove); opercular spine long. Bases of first dorsal fin expanded into broad, flattened horny plates; no plates or spines along base of second dorsal fin.

Colour: red, with dark spots.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Pterygotrigla guezei: opercular spine short; no dark spots on body.



Other species of Triglidae: small plates with strong lateral spines along bases of first and second dorsal fins.

**SIZE:**

Maximum: about 30 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area so far only reported from southern India, but eastward extending through the Eastern Indian Ocean and Western Central Pacific to Japan.

Inhabits mud bottoms to depths beyond 200 m.

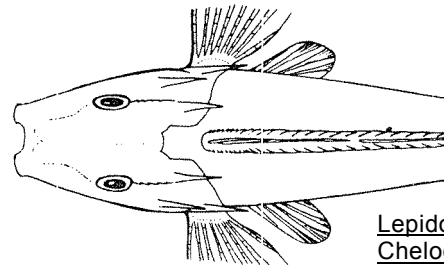
**PRESENT FISHING GROUNDS:**

No present fishery, but taken incidentally throughout its range.

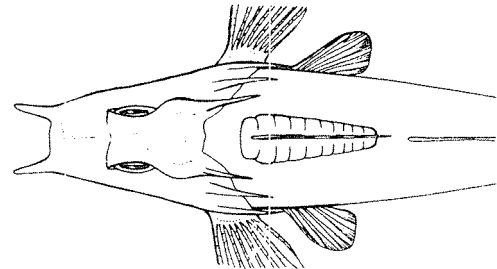
**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught mainly with bottom trawls.

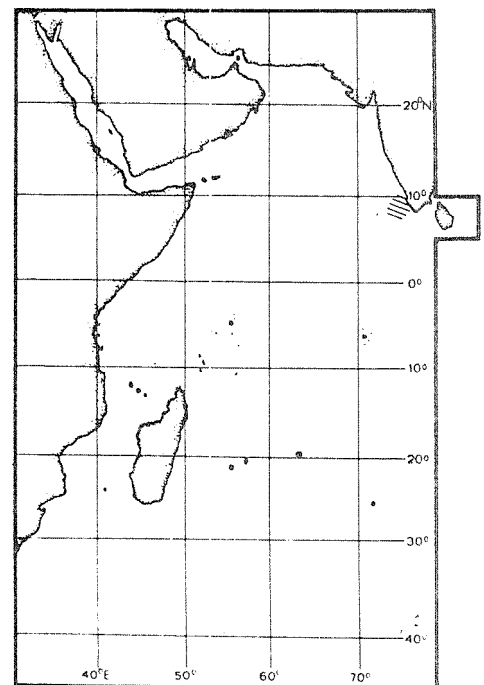


Lepidotrigla  
Chelodiniichthys



***Pterygotrigla***

dorsal view (strongly schematic)





## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

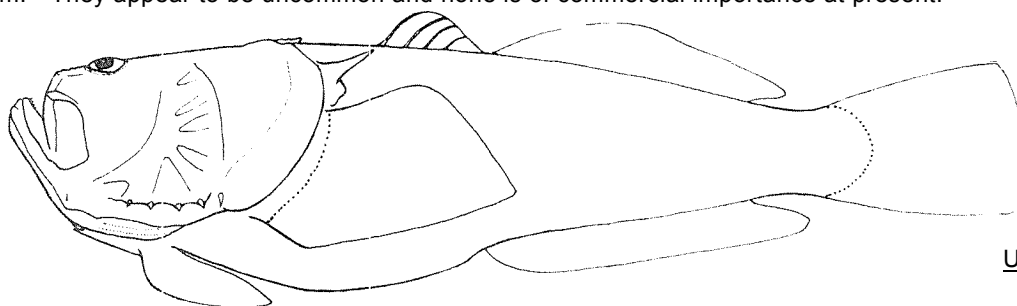
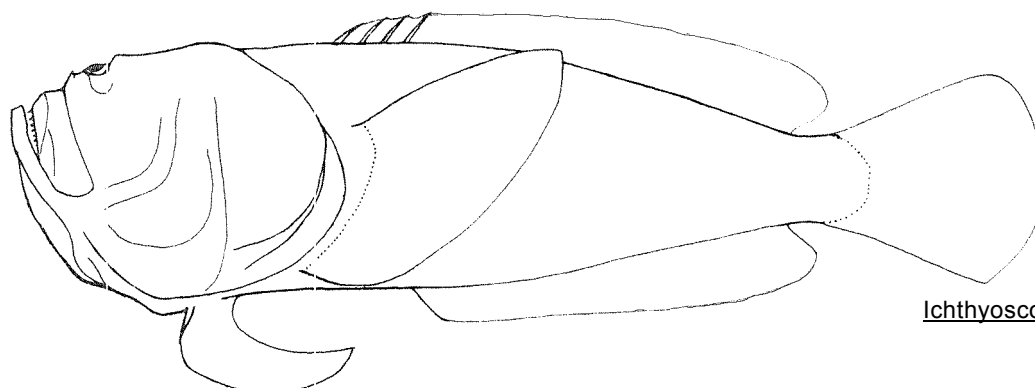
## URANOSCOPIDAE

## Stargazers

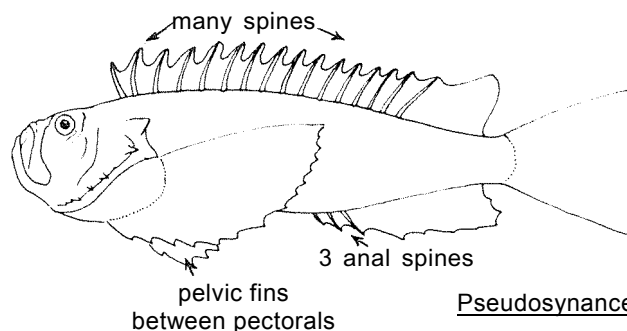
Body thick, compressed posteriorly, naked or with small scales. Head very large, bony and heavy; eyes dorsal; mouth large, vertical; lower jaw heavy, projecting; upper jaw protrusile; maxillaries exposed, with supramaxilla; small teeth in jaws, vomer and on palatines (roof of mouth); gill membranes widely separated, with 6 branchiostegal rays. Spinous dorsal fin small or absent, or continuous with soft-rayed part of fin; soft dorsal and anal fins similar, opposite; pelvic fins on isthmus, well in front of pectorals, with 1 short spine and 5 rays.

Colour: generally brownish with dark or pale spots or mottling on body.

Stargazers are moderate-sized (to 40 cm total length) fishes caught as bycatch in bottom trawls from depths of 40 to 400 m. They appear to be uncommon and none is of commercial importance at present.

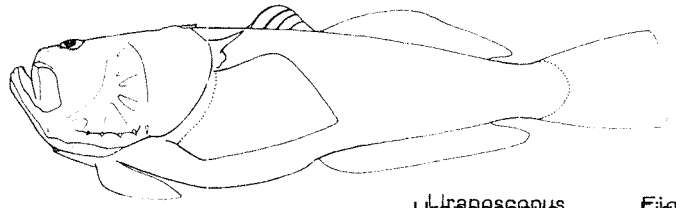
UranoscopusIchthyoscopus**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Scorpaenidae (Synanceja & Pseudosynanceja): pelvic fins located between pectoral fins; 13 to 17 dorsal fin spines (3 or 4 in Uranoscopidae); anal fin with 2 to 4 spines and 4 to 8 soft rays (0 or 1 spines and 12 or more soft rays in Uranoscopidae).

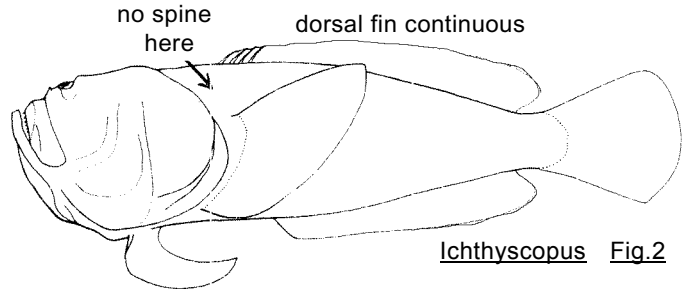
Pseudosynanceja

**KEY TO GENERA OCCURRING IN THE AREA:**

- 1a. Spinous dorsal fin separate from soft-rayed part of fin; large spine just above base of pectoral fin (Fig.1) ..... Uranoscopus
- 1b. Spinous dorsal fin continuous with soft-rayed part of fin; no spine above pectoral fin base (Fig.2) ..... Ichthyoscopus



Uranoscopus Fig.1



Ichthyoscopus Fig.2

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Ichthyoscopus inermis Cuvier, 1829

Uranoscopus archionema Regan, 1921 (= U. haplostoma Regan, 1921)

Uranoscopus crassiceps Alcock, 1890

Uranoscopus fuscomaculatus Kner, 1868

Uranoscopus guttatus Cuvier, 1829

Uranoscopus cognatus Cantor, 1850

## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

## XIPHIIDAE

Swordfishes

A single species in the area - see species sheet for:

Xiphias gladius Linnaeus, 1758 XIPH Xiph 1

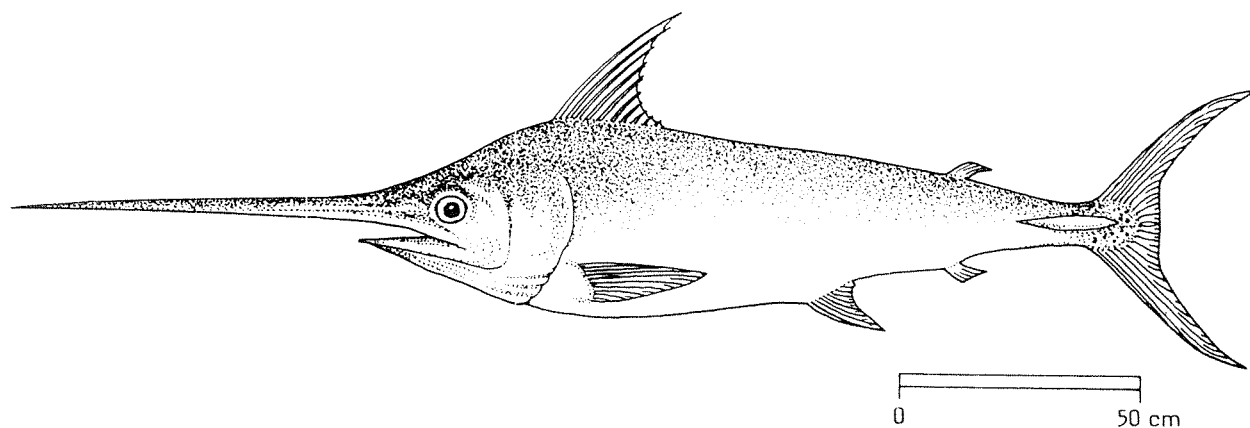
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: XIPHIIDAE

FISHING AREA 52  
(W. Indian Ocean)

<u>Xiphias gladius</u> Linnaeus, 1758
---------------------------------------

## OTHER SCIENTIFIC NAMES STILL IN USE:

Xiphias estara Phillipps, 1932Xiphias gladius estara: Whitley, 1968

## VERNACULAR NAMES:

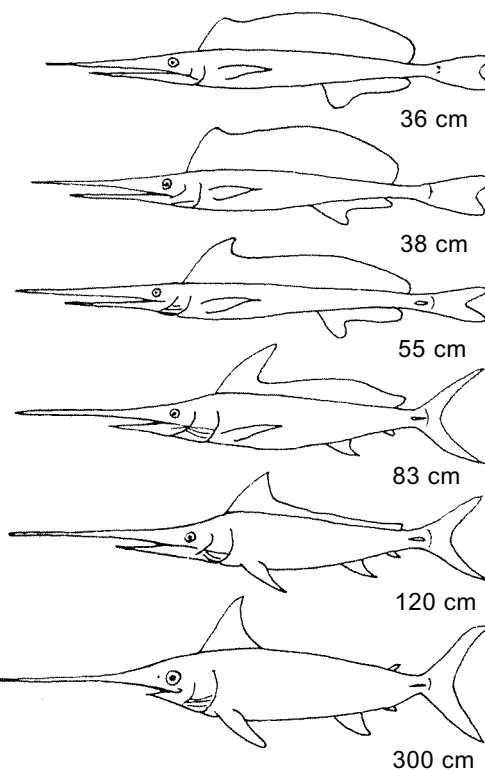
FAO: En - Swordfish  
Fr - Espadón  
Sp - Pez espada

NATIONAL :

## DISTINCTIVE CHARACTERS:

Body elongate and cylindrical. Upper jaw prolonged into a long bill, flat oval in cross-section about both jaws prolonged into long bills in immature individuals); eye large; mouth not protrusible; fine, file-like teeth present in specimens of about 1 m (body length), disappearing with growth; gill opening wide, gill membranes united only basally and free from isthmus; no gillrakers on gill arches. Two separate dorsal fins in adults (continuous in immature specimens), the first much larger than the second; two separate anal fins in adults (continuous in immature specimens) the first much larger than the second; pectoral fins falcate, a little rigid and situated low on body sides; pelvic fins absent; caudal fin large and lunate; a large keel present on each side of caudal peduncle. Lateral line indistinct, but recognizable in specimens to about 1 m (body length) as a wavy-shaped line, disappearing with growth. Scales with small spines present in specimens to about 1 m (body length). Vertebrae 26 (15 + 11 or 16 + 10).

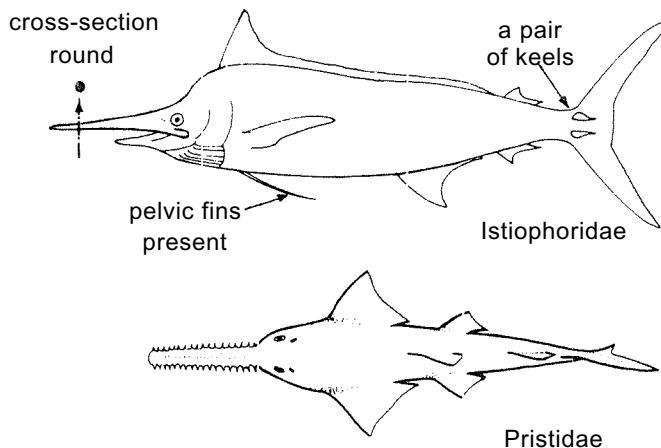
Colour: dorsal and lateral sides of body blackish-brown, gradually fading to light-brown on ventral side; fin membrane of first dorsal fin dark blackish-brown; other fins brown or blackish-brown.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

**Istiophoridae:** upper jaw prolonged into a long spear, its cross-section round; fine rasp-like teeth present on both jaws; 2 dorsal fins close together, the first much larger than the second; pelvic fins present; a pair of keels present on each side of caudal fin base; lateral line present; vertebrae 24 (26 in Xiphiidae).

**Pristis (Pristidae):** the body colour and the prolonged flat bill are similar to those in swordfish, but differ in having a more depressed body, a flat bill with long spines on both lateral margins and 5 gill slits on ventral side of body.



### SIZE:

Maximum: 444 cm (total length) and 536 kg; common to 300 cm (total length).

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Worldwide in tropical and temperate waters, sometimes migrate to cold waters; found throughout the area.

Epipelagic, primarily oceanic, but sometimes seen in coastal waters as well; highly migratory and aggressive, usually not forming schools; generally found above the thermocline but fairly often seen in considerable depth (about 800 m).

Feeds on a wide variety of fish, especially schooling fishes, crustaceans and squids. Believed to use its sword to kill prey.

### PRESENT FISHING GROUNDS:

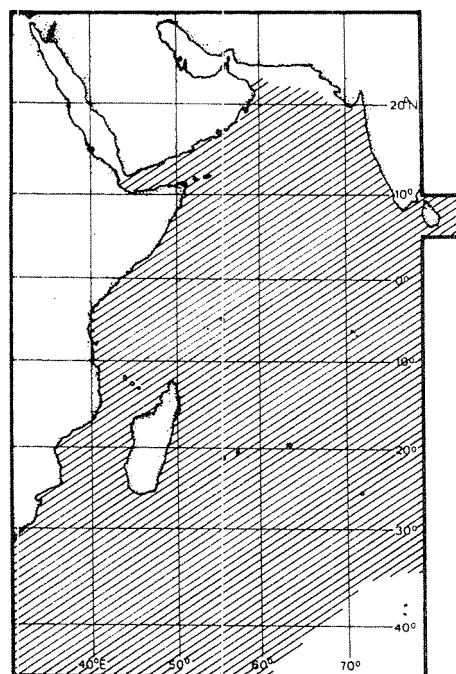
Good commercial longline fishing grounds around 15°N lat (Arabian Sea).

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

The reported catches for this species in the area totalled about 900 t in 1981.

Caught mainly with surface longlines and harpooning, sometimes with driftnets or surface gillnets as bycatch (commercial fishing boats); by trolling (sports fishing boats).

Marketed iced locally, usually frozen by longliners; prepared as sashimi (sliced raw fish) and teriyaki (grilled with soy-sauce and sugar) in Japan; usually prepared as steaks. Flesh oily and tasty.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

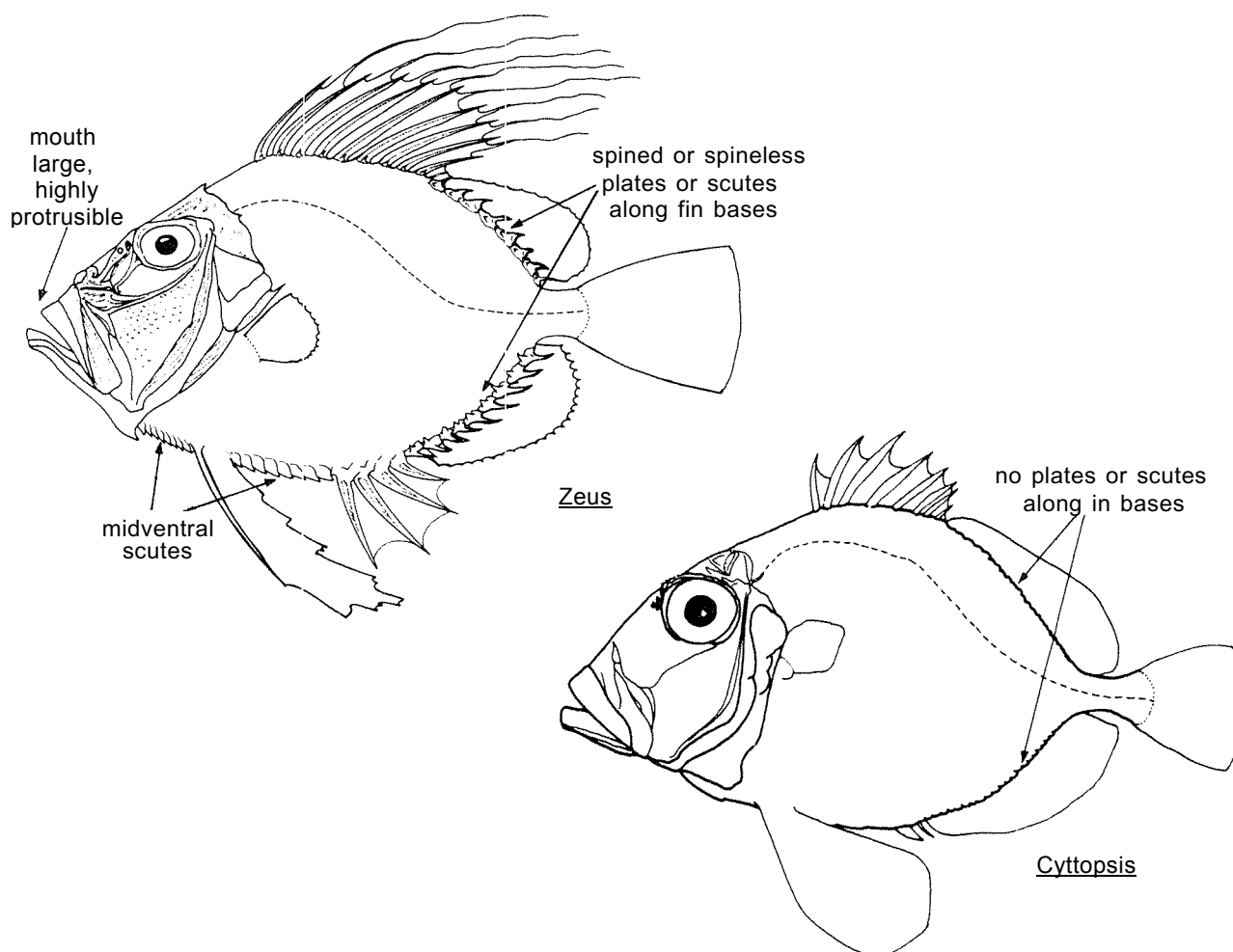
## ZEIDAE

## Dories

Body oval, compressed, its depth greater than head length. Head compressed; mouth large, oblique; upper jaw very protrusible; narrow bands of small teeth on jaws and vomer (roof of mouth); no spines or serrae on opercular bones. Dorsal fin with 7 to 11 spines and 22 to 30 soft rays; anal fin with 1 to 4 spines and 20 to 30 soft rays; pelvic fins with 6 to 10 soft rays and with or without a spinous first ray; dorsal, anal and pectoral fin rays unbranched; caudal fin with 11 branched rays. Scales small, rudimentary or absent; bony scutes along midventral part of abdomen.

Colour: silvery grey, bronzy or rosy pink.

Small to medium-sized fishes taken in trawls over the outer continental shelf and upperslope region (100 to 300 m depth). Not of commercial importance although some species are sold in markets of South Africa and India. Flesh excellent.



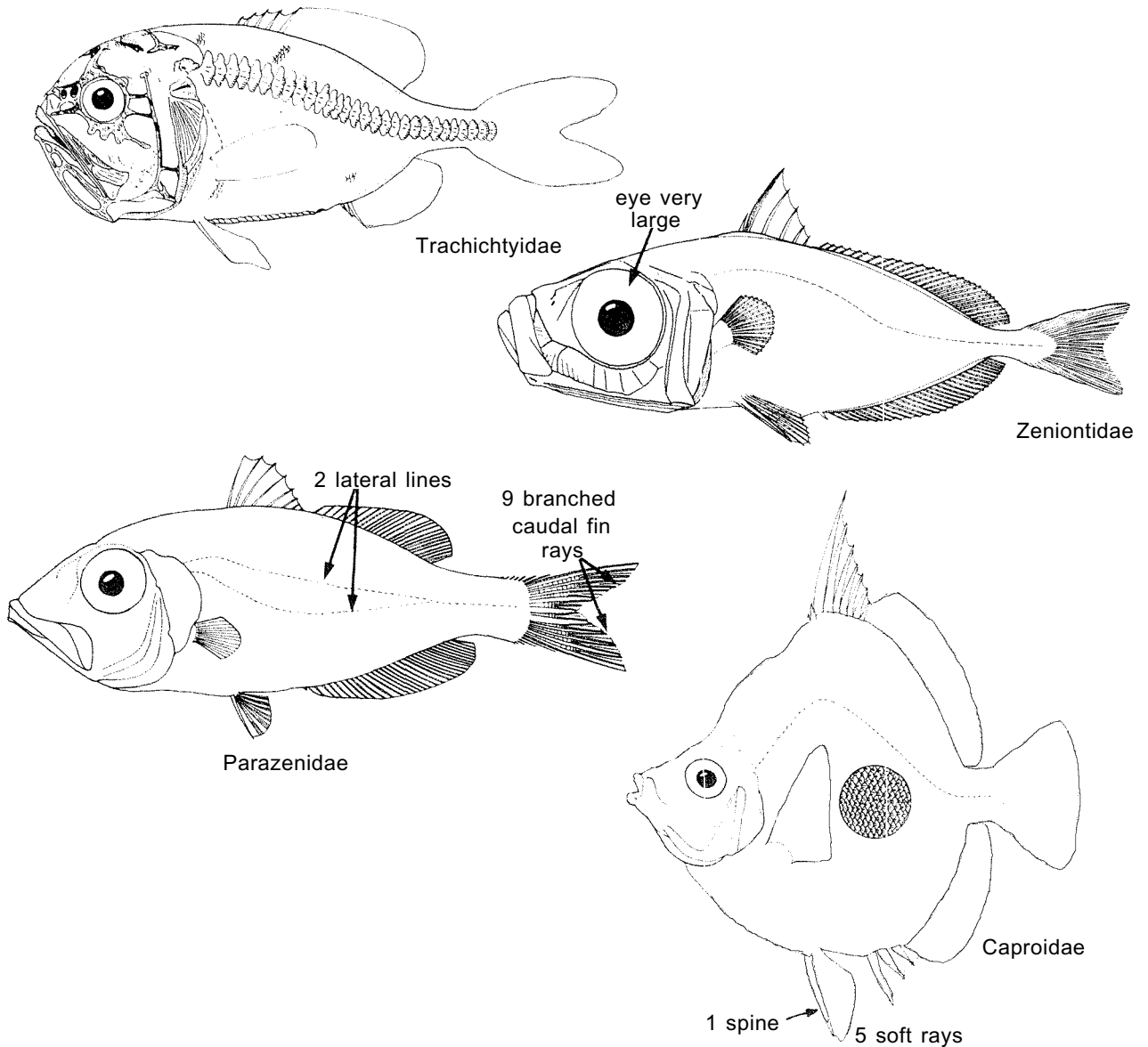
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Trachichthyidae: dorsal fin with 3 to 8 spines and 9 to 18 soft rays (7 to 11 spines; and 22 to 30 soft rays in Zeidae); anal fin with 2 or 3 spines and 8 to 12 soft rays (1 to 4 spines and 20 to 30 soft rays in Zeidae); a distinct spine on preopercle and on opercle.

Zeniontidae: body more elongate, its depth 2.3 to 2.7 times in standard length; eye large, its diameter 1.9 to 3.0 in head length.

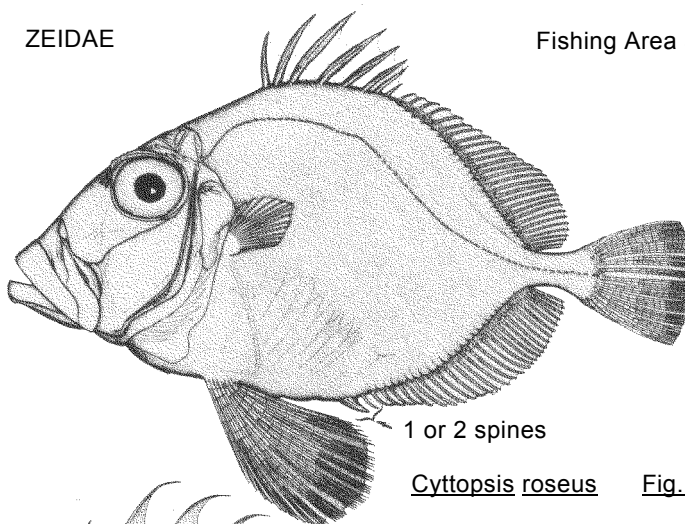
Parazenidae: body more elongate, the depth 2.1 to 2.5 times in :standard length; 2 lateral lines joining under end of soft dorsal fin, caudal fin branched rays 9 (11 in Zeidae).

Caproidae: pelvic fins with 1 spine and 5 soft rays; dorsal, anal and pectoral fin rays branched.



**KEY TO SPECIES OCCURRING IN THE AREA:**

1a. Pelvic fins with 9 or 10 branched soft rays and no spine; anal fin with 1 or 2 short spines and 29 or 30 soft rays; no bony plates or spines along bases of dorsal and anal fins (Fig.1) ..... Cyttopsis

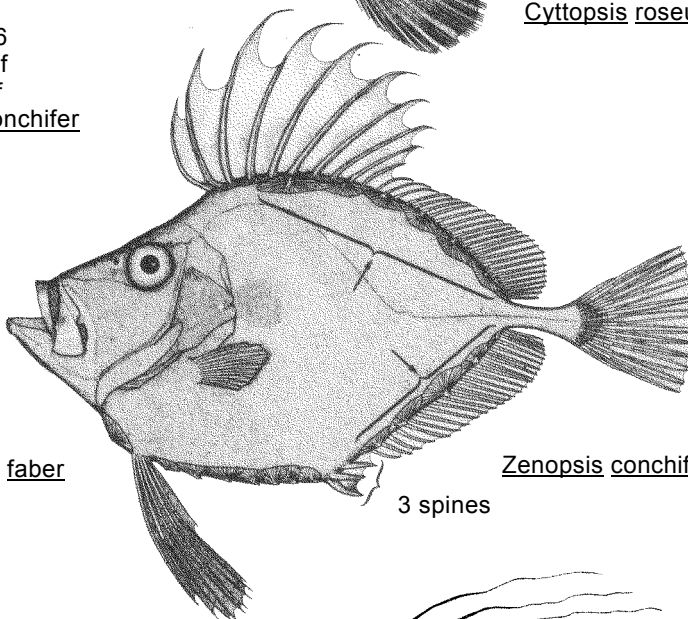


1 or 2 spines

Cyttopsis roseus Fig.1

1b. Pelvic fins with 1 slender, flexible spine and 5 to 7 soft rays; anal fin with 3 or 4 distinct spines and 20 to 26 soft rays; a row of bony plates or spines along base, of dorsal and anal fins (Figs 2 to 4)

2a. Anal fin with 3 spines; 5 or 6 bony plates along base of spinous and soft-rayed parts of dorsal fin (Fig.2) ... Zenopsis conchifer

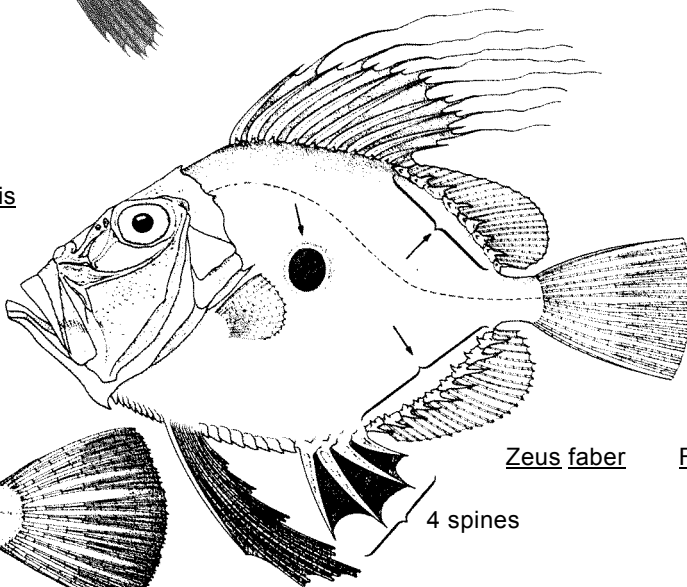


3 spines

Zenopsis conchifer Fig.2

2b. Anal fin with 4 spines; no bony plates along base of spinous dorsal fin (Figs 3,4)

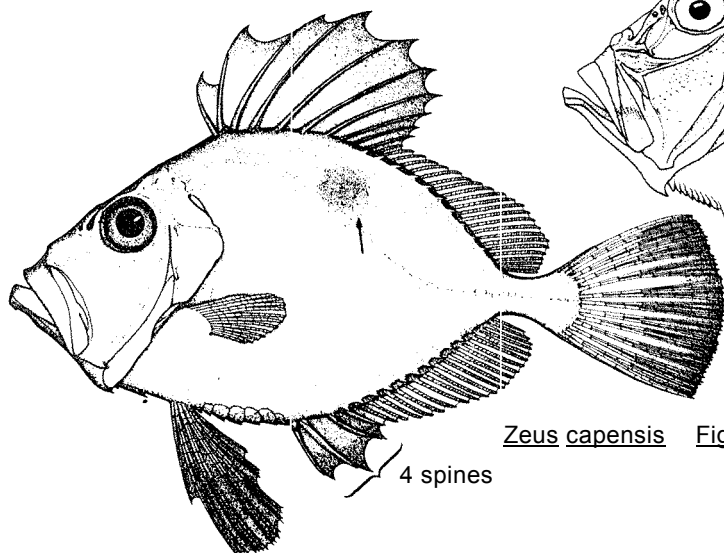
3a. Blue-black ocellus on midlateral part of body below lateral lines; 5 to 10 large bony plates, each with a spine, along base of soft dorsal and anal fins (fig.3) ..Zeus faber



Zeus faber Fig.3

4 spines

3b. Black spot (sometimes indistinct) surrounded by several smaller silver spots, on or above lateral line and below anterior soft dorsal rays; 9 to 12 spines along base of soft dorsal and anal fins (Fig.4)..Zeus capensis



Zeus capensis Fig.4

4 spines



**LIST OF SPECIES OCCURRING IN THE AREA:**

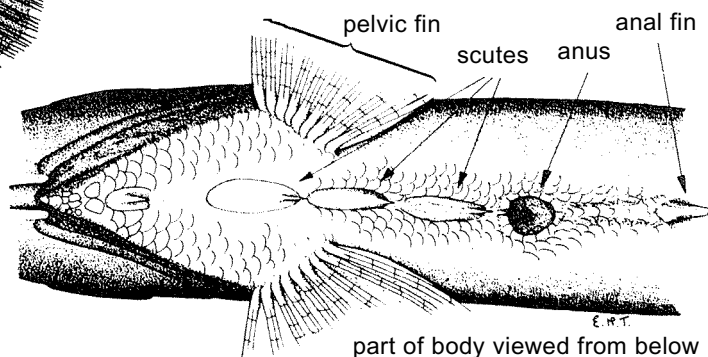
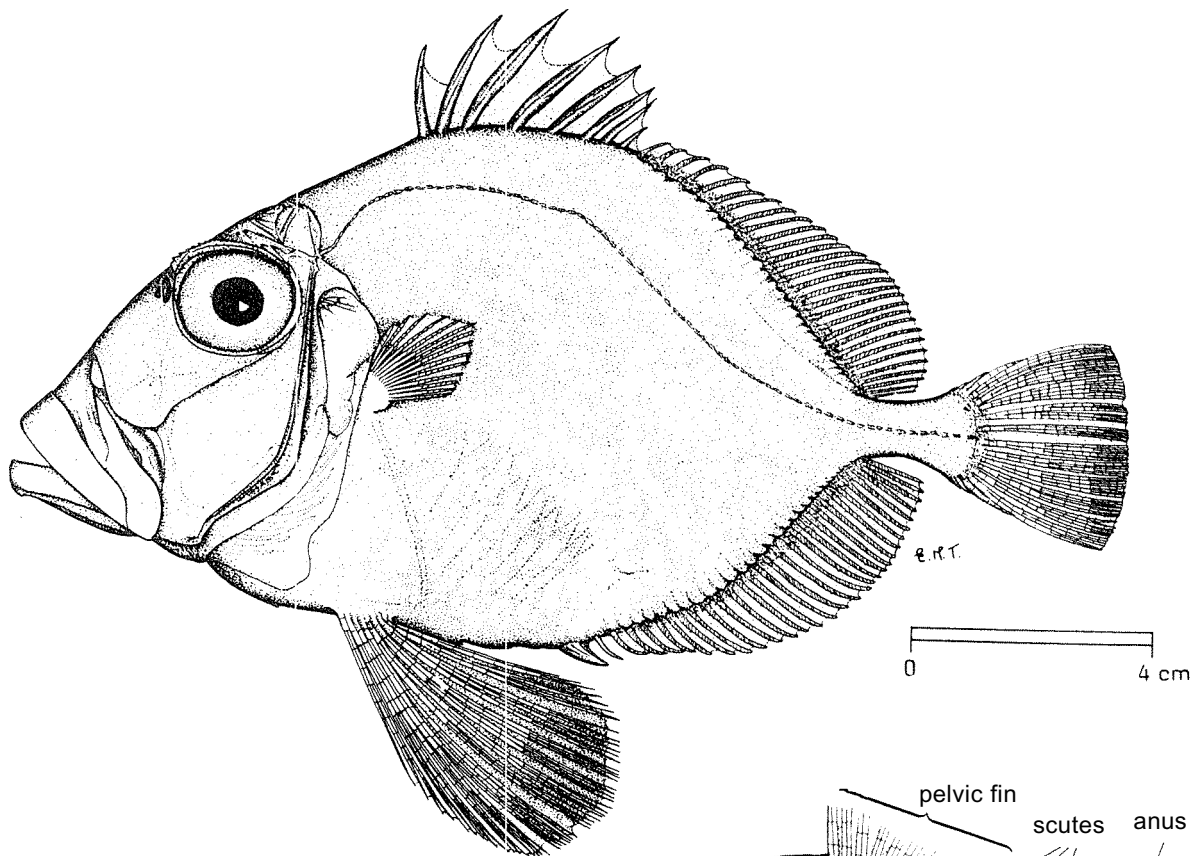
Code numbers are given for those species for which Identification Sheets are included

<u>Cyttopsis roseus</u> (Lowe, 1843)	ZEID Cyttop 1
<u>Zenopsis conchifer</u> (Lowe, 1852)	ZEID Zen 1
<u>Zeus capensis</u> Valenciennes, 1835	ZEID Zeus 2
<u>Zeus faber</u> Linnaeus, 1758	ZEID Zeus 1

Prepared by P.C. Heemstra; illustrations by E.M. Tarr. J.L.B. Smith Institute of Ichthyology, Grahamstown, South Africa

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ZEIDAE

FISHING AREA 51  
(W. Indian Ocean)Cyttopsis roseus (Lowe, 1843)OTHER SCIENTIFIC NAMES STILL IN USE: Zen itea (Jordan & Fowler, 1902)  
Zen scutatus (Gilchrist & von Bonde, 1924)

## VERNACULAR NAMES:

FAO :           En - Rosy dory  
                  Fr - Saint Pierre  
                  Sp - San Pedro

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body oval, strongly compressed, covered with small, thin, deciduous, cycloid scales. Chest (between and in front of pelvic fins) flattened and broad. Upper edge of bony orbit with small spines anteriorly. Two large keeled scutes, each ending in a spine, between pelvic fins and rays, and another scute midway between pelvics; a row of low bony ridges or bumps along bases of soft dorsal and anal fins. Dorsal fin with 7 or 8 spines and 28 to 30 soft rays; pelvic fins with 9 or 10 soft segmented, branched) rays and no spine; anal fin with 1 or 2 flattened (compressed) immovable pines, the first much larger than the second, and 28 to 30 soft rays.

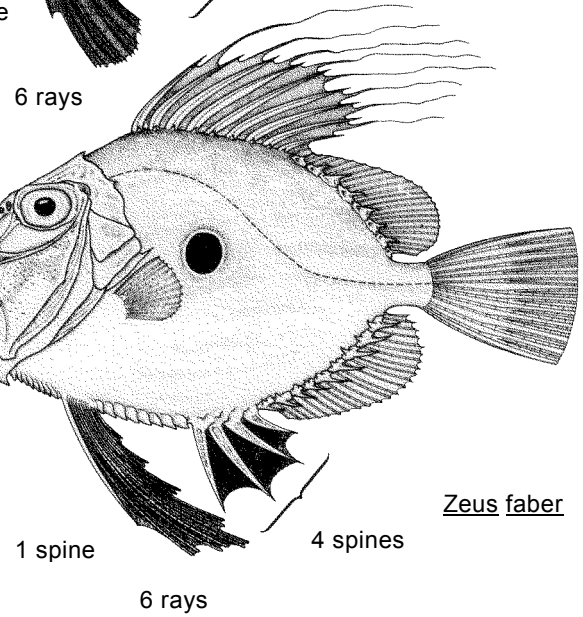
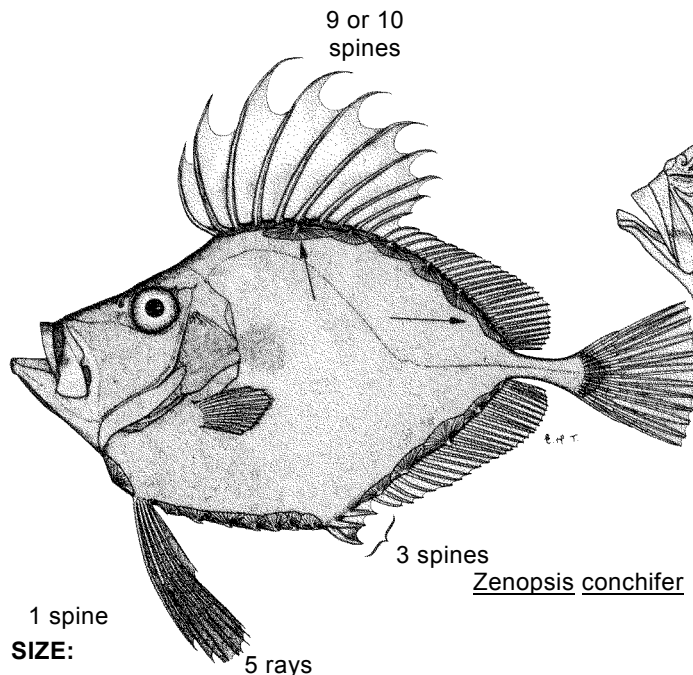
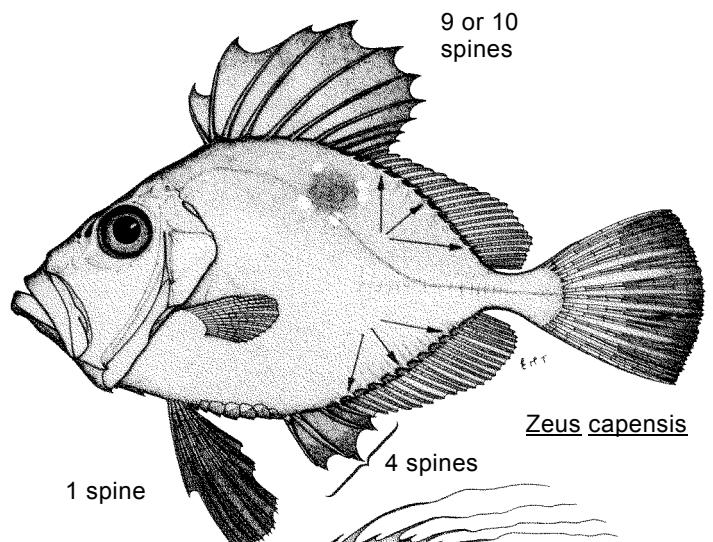
Colour: rosy pink and silvery in life; pelvic fins reddish, the membranes black.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Zeus capensis: pelvic fins with 1 spine and 6 soft rays (no spines and 9 or 10 soft rays in C. roseus), dorsal fin with 9 or 10 spines and 22 to 24 soft rays (7 or 8 spines and 28 to 30 soft rays in C. roseus); anal fin with 4 spines and 20 to 22 soft rays (1 or 2 spines and 28 to 30 soft rays in C. roseus); 9 to 12 spines along each side of soft dorsal and anal fin base.

Zeus faber: pelvic fins with 1 spine and 6 or 7 soft rays; dorsal fin with 10 spines and 22 to 24 soft rays; anal fin with 4 spines and 21 to 23 soft rays; 5 to 10 bony plates, each with 1 or 2 spines along each side of soft parts of dorsal and anal fin bases.

Zenopsis conchifer: pelvic fins with 1 spine and 5 soft rays; dorsal fin with 9 or 10 spines and 24 to 26 soft rays; anal fin with 3 spines and 24 to 26 soft rays; 5 to 7 large bony plates along bases of dorsal and anal fins.



**SIZE:**  
Maximum: 22 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, from South Africa to India, but not in the Red Sea; also occurs on both sides of the Atlantic and off Japan.

Apparently a rather uncommon species found near the bottom on the continental shelf; beyond 200 m depth.

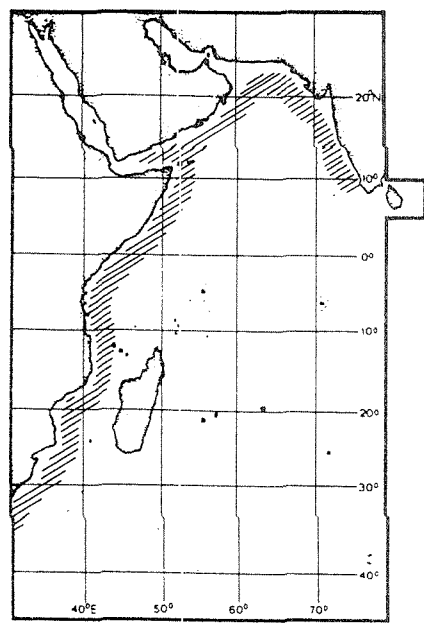
**PRESENT FISHING GROUNDS:**

Trawlable bottoms in depths of 400 to 600 m. At present not fished commercially.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with bottom trawls.

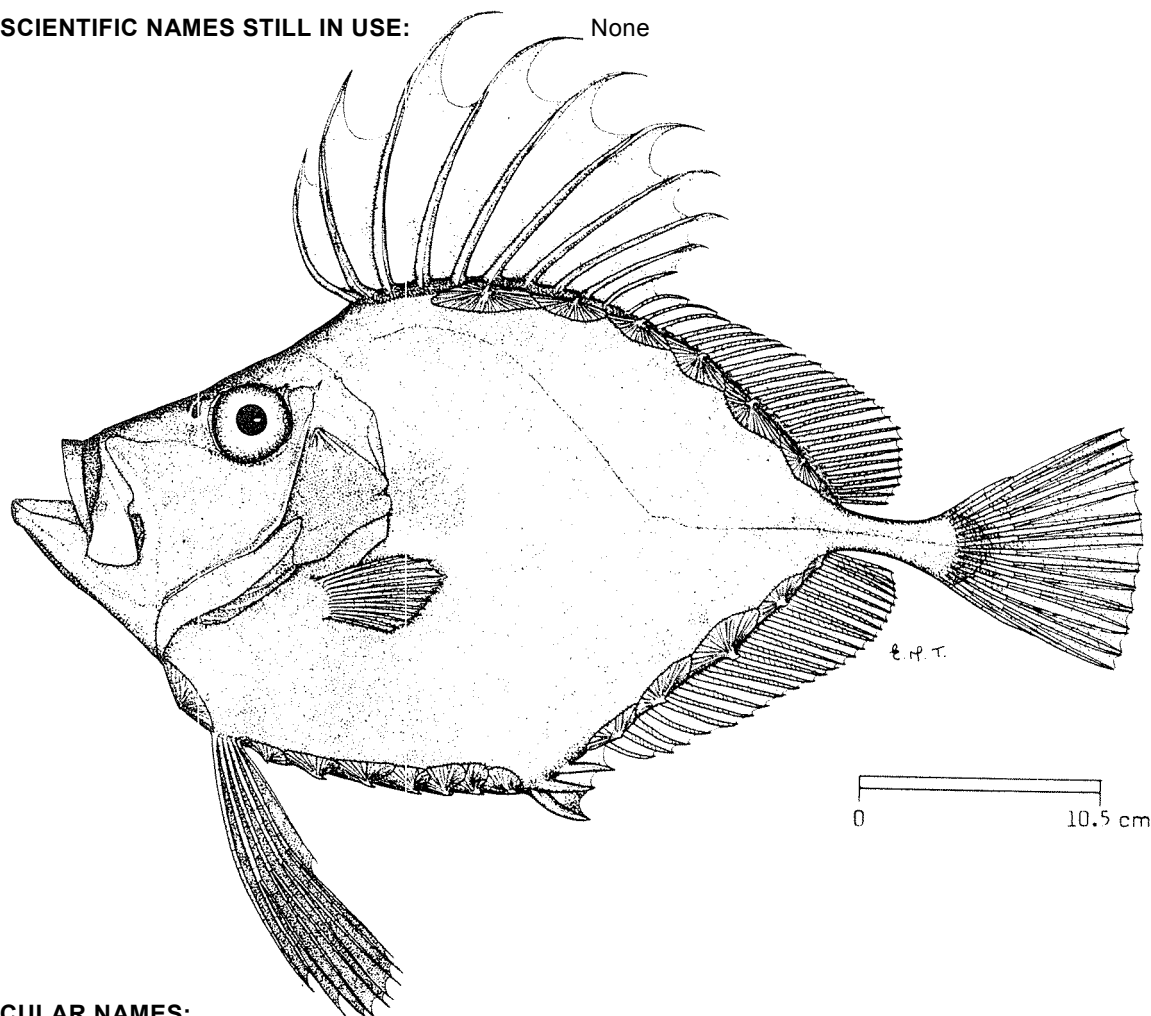


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ZEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Zenopsis conchifer* (Lowe, 1852)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Silvery John dory  
                   Fr - Saint Pierre argenté  
                   Sp - San Pedro plateado

NATIONAL :

## DISTINCTIVE CHARACTERS:

Body oval, strongly compressed, without scales. Seven pairs of keeled bony scutes between pelvic fins and first anal spine; 1 to 3 bony plates at base of first dorsal fin, 4 or 5 along base of soft dorsal, and 5 to 7 along base of anal fin. Dorsal fin with 9 or 10 spines and 24 to 27 soft rays; anal fin with 3 spines and 24 to 26 soft rays; pelvic fins with 6 or 7 rays, their origin in front of vertical through front edge of eye. Caudal peduncle length about 3 times its least depth.

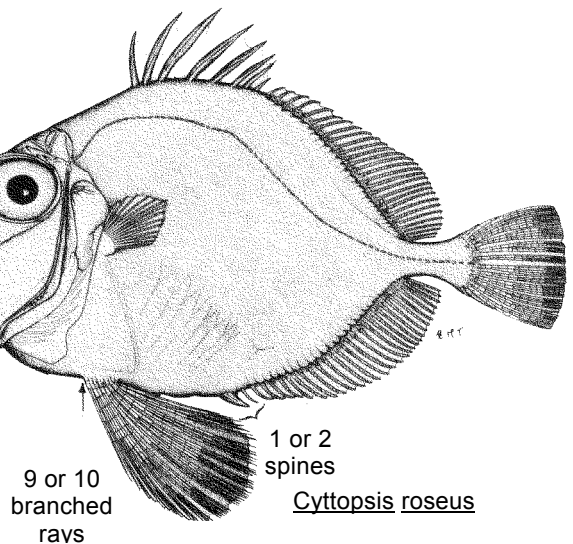
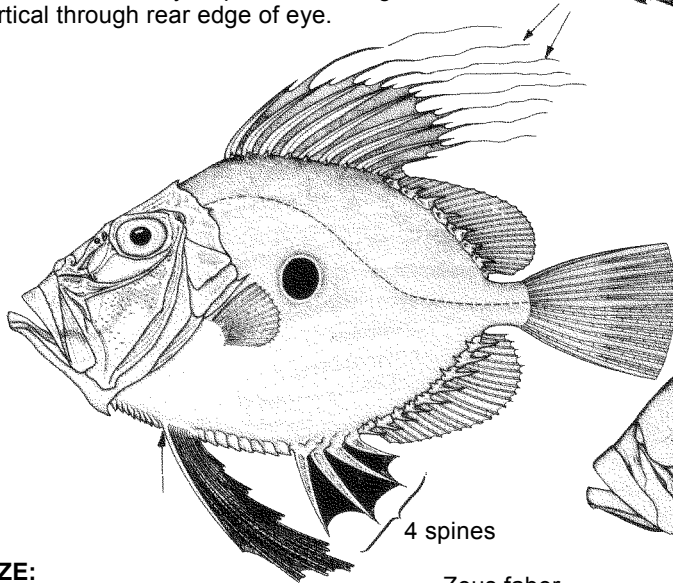
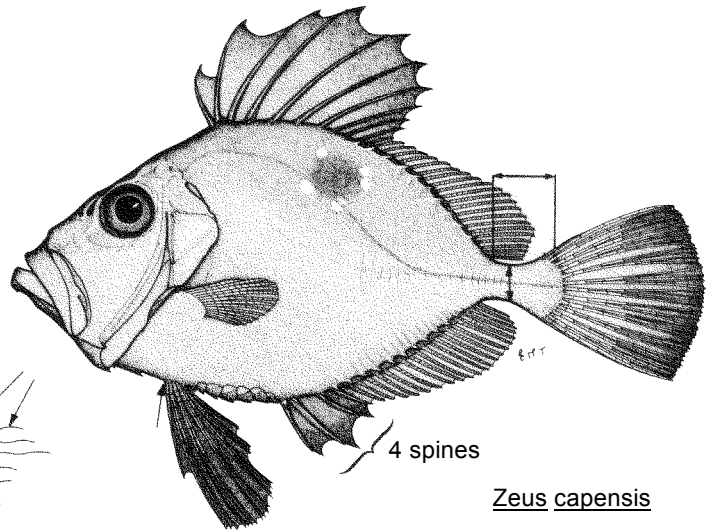
Colour: adults silvery grey, with a faint dusky midlateral blotch just behind head; first dorsal and pelvic fins blackish. Juveniles silvery, with several dark blotches.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Zeus capensis: anal fin with 4 spines (3 in Z. conchifer); no spiny plates along base of spinous dorsal fin; pelvic fin origin well behind vertical through middle of eye; caudal peduncle length about twice its depth.

Zeus faber: anal fin with 4 spines; no spiny plates along base of spinous dorsal fin; pelvic fin origin well behind vertical through middle of eye; caudal peduncle length subequal to its depth.

Cyttopsis roseus: anal fin with 1 or 2 short spines; no bony plates along bases of dorsal and anal fins; pelvic fins with 9 or 10 branched soft rays; pelvic fin origin behind vertical through rear edge of eye.



**SIZE:**

Maximum: 70 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, from South Africa to India, but not in the Red Sea; also known from both sides of the Atlantic.

Found near the bottom on the deeper part of the continental shelf and the slope, beyond 90 m depth. Apparently rather uncommon.

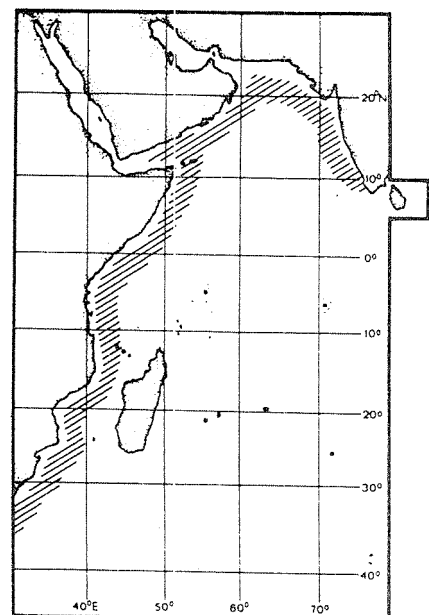
**PRESENT FISHING GROUNDS:**

Trawlable bottoms in depths of 90 to 360 m. Not fished commercially.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

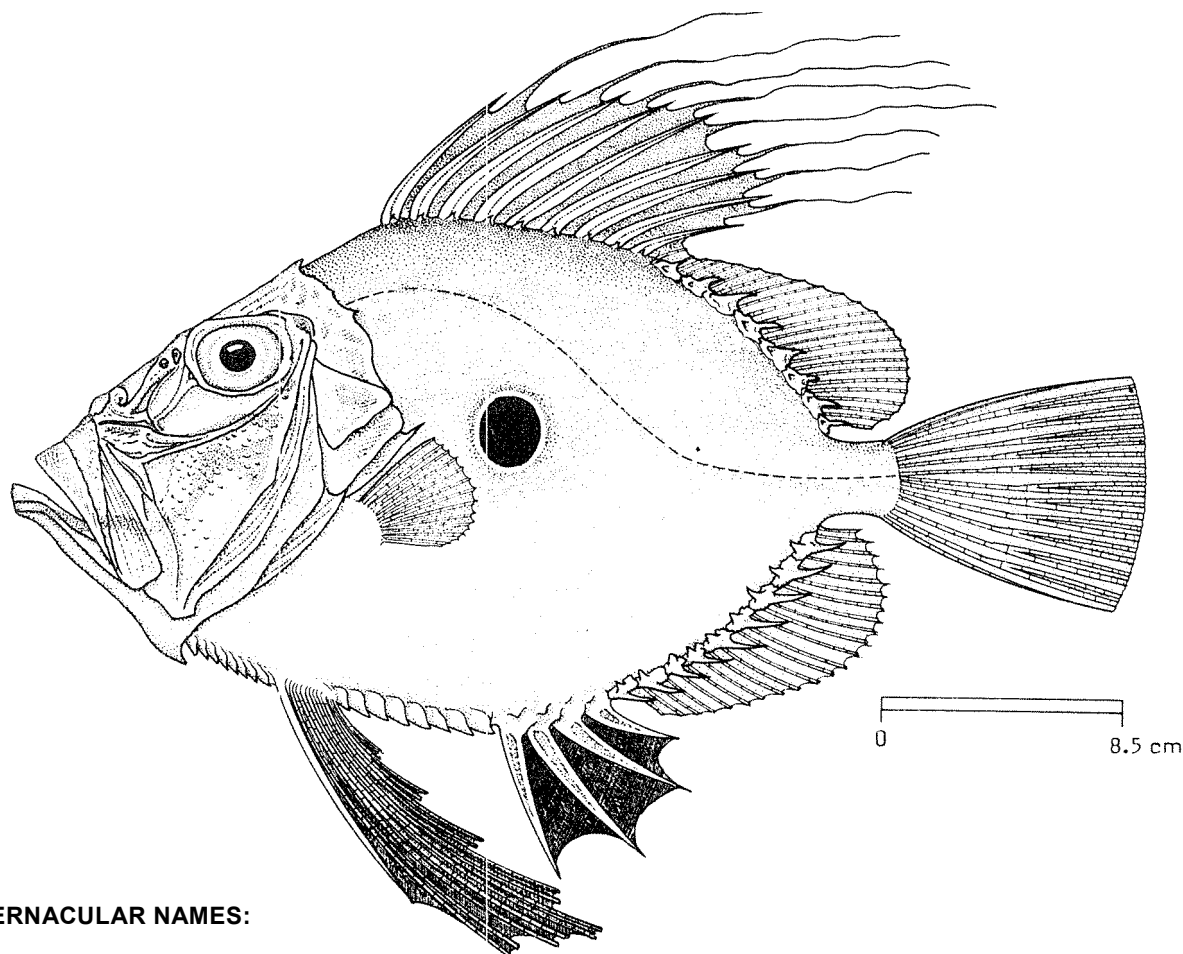
Separate statistics are not reported for this species.

Caught with bottom trawls.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ZEIDAE

FISHING AREA 51  
(W. Indian Ocean)Zeus faber Linnaeus, 1758OTHER SCIENTIFIC NAMES STILL IN USE : Zeus japonicus Valenciennes, 1835

## VERNACULAR NAMES:

FAO :           En - John dory  
                  Fr - Saint Pierre  
                  Sp - Paz de San Pedro

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body oval, strongly compressed; scales: minute (not visible without magnification). Caudal peduncle subequal to its length. Two rows of bony scutes along midventral part of chest and belly; 5 to 10 bony plates, each with 1 or 2 spines along each side of the soft dorsal and anal fin bases. Dorsal fin with 10 spines and 22 to 24 soft rays; spinous dorsal fin membranes elongated into filaments; anal fin with 4 spines and 21 to 23 soft rays; pelvic fins with 1 spine and 6 or 7 soft rays.

Colour: silvery bronze with golden or brownish wavy horizontal streaks; a conspicuous ocellus (yellow or white-edged black spot) on sides below lateral line and above level of pectoral fin base; pelvics and spinous anal fin black.

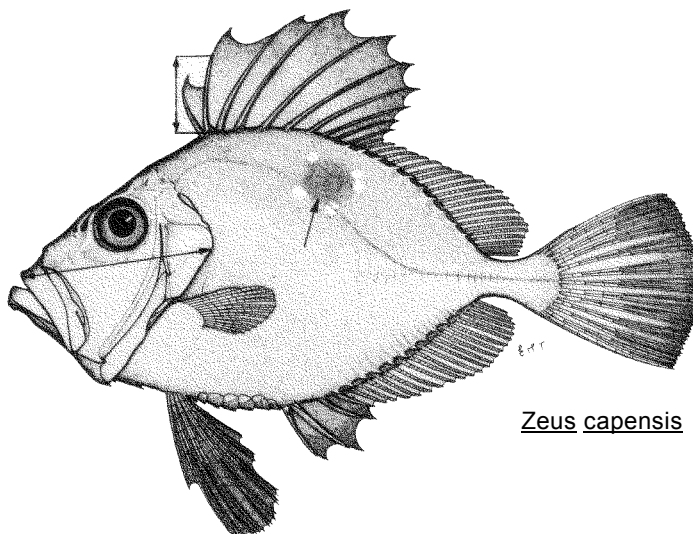


**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

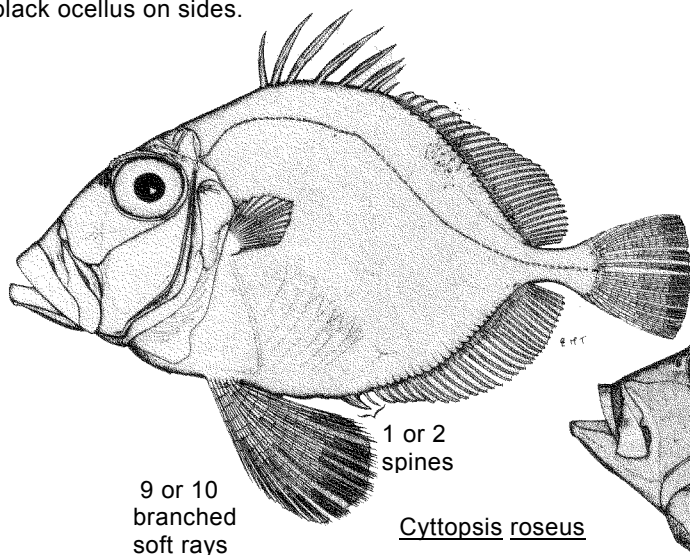
Zeus capensis: 9 to 12 spines along each side of soft dorsal and anal fin bases; spinous dorsal fin membrane not elongated into filaments; length of second dorsal spine 2 to 3 times in head length; a dusky blotch (sometimes indistinct) surrounded by several smaller silver spots, on or above lateral line and below anterior soft dorsal rays.

Zenopsis conchifer: anal fin with 3 spines; 5 or 6 bony plates along bases of spinous and soft-rayed parts of dorsal fin (no plates along spiny part of dorsal fin in Z. faber); caudal peduncle depth about 3 times in its length; no distinct black ocellus on sides.

Cyttopsis roseus: pelvic fins with 9 or 10 branched rays and no spine; anal fin with 1 or 2 short spines and 29 or 30 soft rays; no bony plates along bases of dorsal and anal fins; no black ocellus on sides.



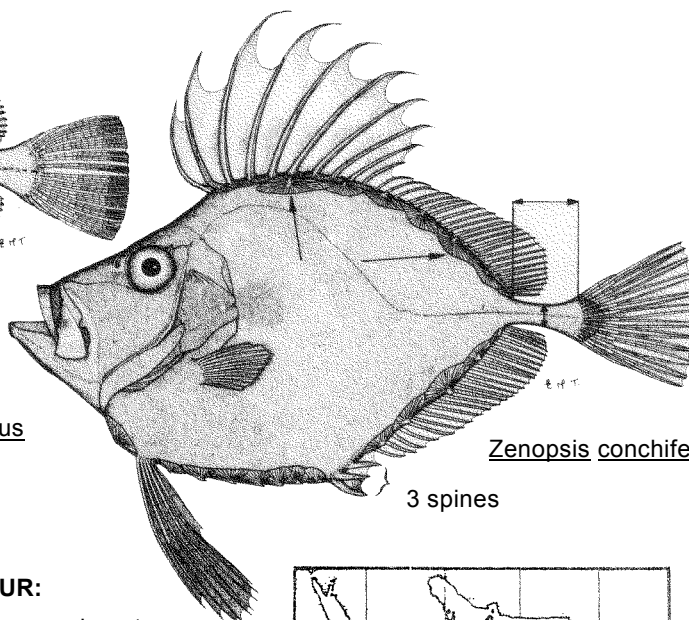
Zeus capensis



9 or 10  
branched  
soft rays

1 or 2  
spines

Cyttopsis roseus



Zenopsis conchifer

3 spines

**SIZE :**

Maximum: about 60 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Known from South, Africa, Tanzania and Kenya; absent from the Red Sea. Also present in the eastern Atlantic, Mediterranean Sea, Japan, Australia and New Zealand.

Generally solitary, near the bottom or in midwater, from 60 to 360 m depth.

Feeds on a wide range of fishes, cephalopods and crustaceans.

**PRESENT FISHING GROUNDS:**

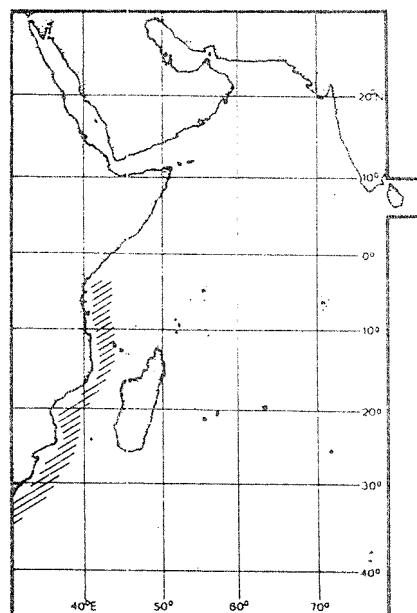
Trawlable bottoms on the outer continental shelf and upper slope

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :**

Separate statistics are not reported for this species.

Caught with bottom trawls.

Marketed fresh, frozen or smoked; an excellent foodfish.

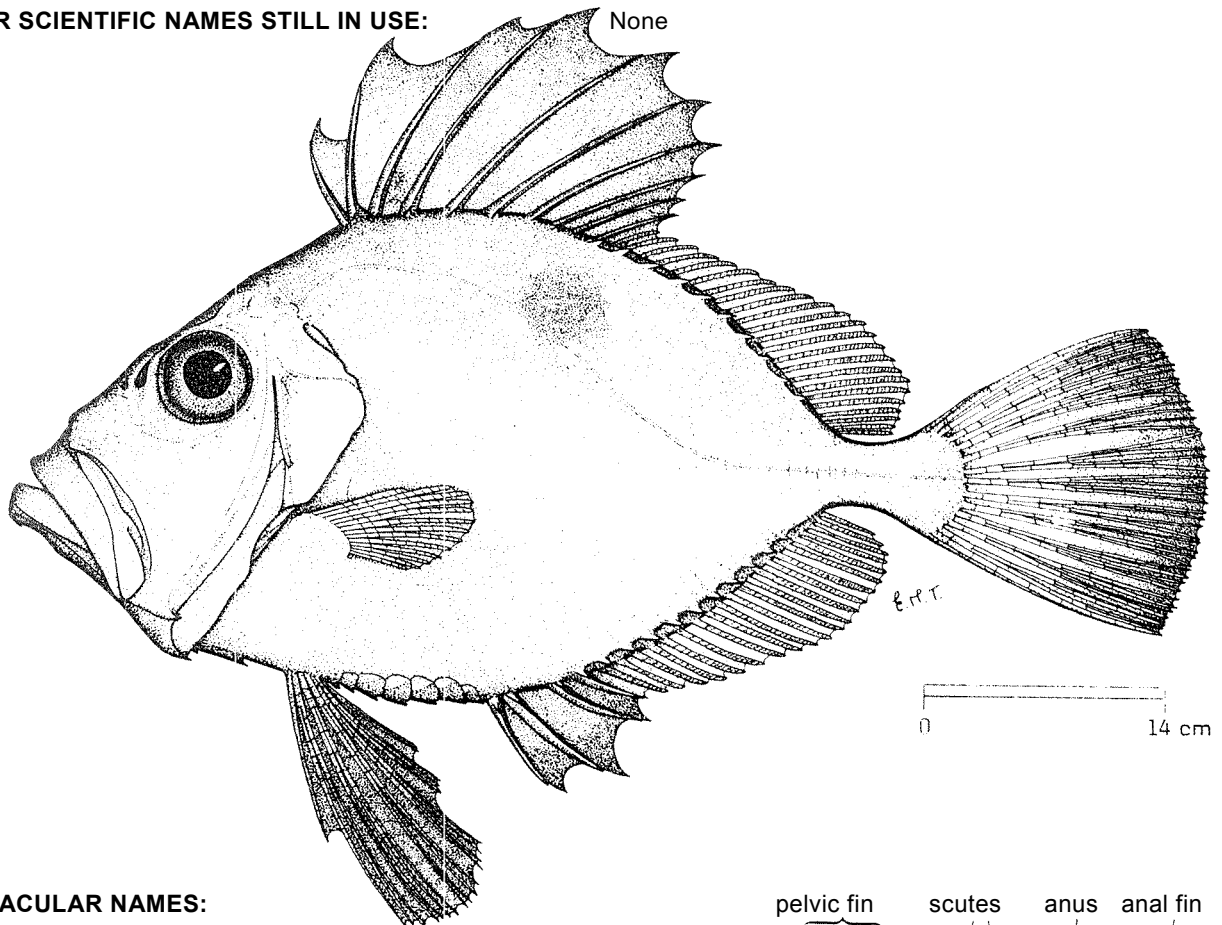


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ZEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Zeus capensis* Valenciennes, 1835

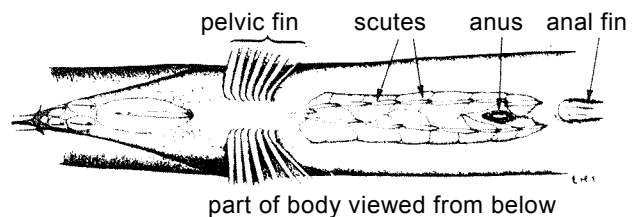
OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Cape Dory  
                   Fr - Saint Pierre du Cap  
                   Sp - San Pedro del Cabo

NATIONAL:



## DISTINCTIVE CHARACTERS:

Body oval, strongly compressed; scales minute (not visible without magnification). Least depth of caudal peduncle distinctly less than its length. Two rows of bony scutes along midventral part of chest and belly; a row of 9 to 12 short spines along each side of soft dorsal and anal fin bases. Dorsal fin with 9 or 10 spines and 22 to 24 soft rays; spinous dorsal fin membranes not produced into long filaments; anal fin with 4 spines and 20 to 22 soft rays; pelvic fins with 1 slender, flexible spine and 6 or 7 soft rays.

Colour: body silvery grey, with a faint dusky blotch on or above lateral line and below posterior dorsal fin

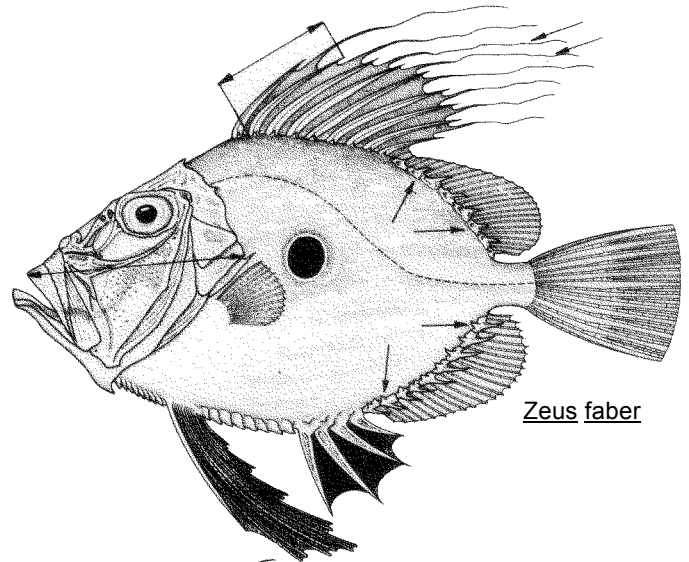


## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

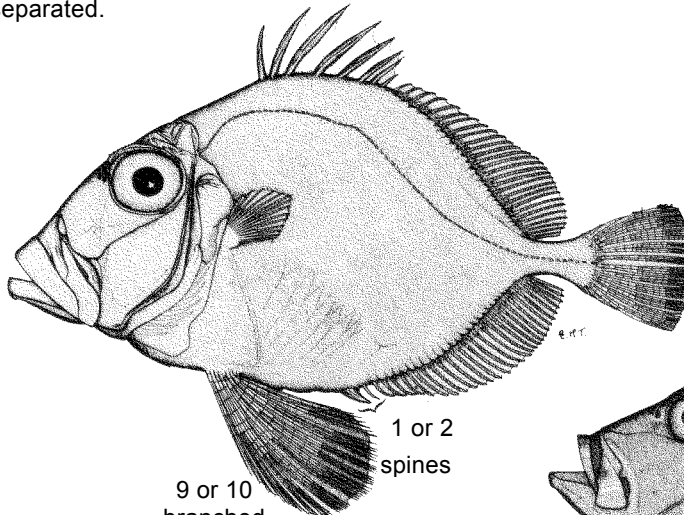
Zeus faber: 5 to 10 bony plates, each with 1 or 2 spines along each side of soft dorsal and anal fin bases; spinous dorsal fin membrane produced into filaments; length of second dorsal spine more than half of head length.

Zenopsis conchifer: anal fin with 3 spines and 24 to 26 soft rays; 5 or 6 bony plates along bases of spinous and soft-rayed parts of dorsal fin; caudal peduncle depth about 3 times in its length.

Cyttopsis roseus: pelvic fins with 9 or 10 branched rays and no spines; anal fin with 1 or 2 short spines and 29 or 30 soft rays; no spines along bases of dorsal and anal fins; pelvic fins well separated.



Zeus faber



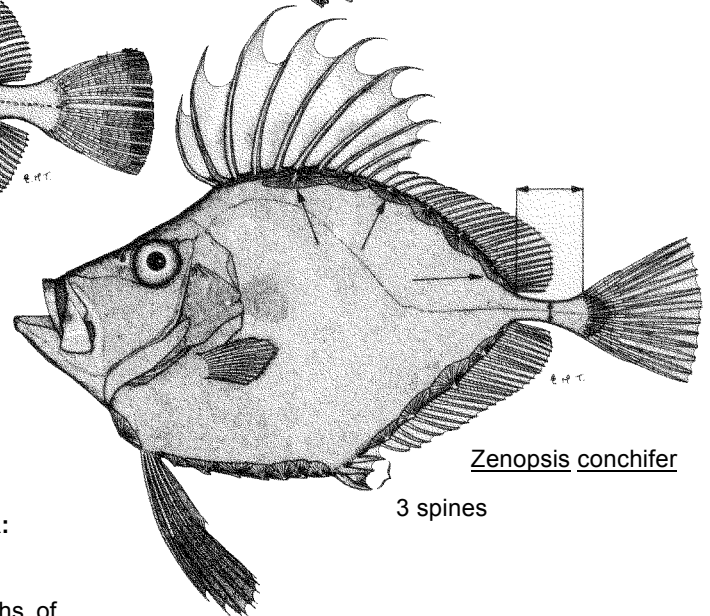
9 or 10  
branched  
rays

1 or 2  
spines

Cyttopsis roseus

### SIZE:

Maximum: about 90 cm.



Zenopsis conchifer

3 spines

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Known only from South Africa.

Found near the bottom or in midwater in depths of 35 to 200 m.

Feeds on a wide range of fishes, cephalopods and crustaceans.

## PRESENT FISHING GROUNDS:

Trawlable bottoms on the continental shelf.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with bottom trawls.

Marketed fresh or frozen; an excellent foodfish.

[click for previous page](#)

# CHIMAERAS

## GENERAL REMARKS

Chimaeras are somewhat compressed, sharklike fishes that resemble grenadiers (Macruridae) in shape but are true cartilaginous fishes (Chondrichthyes), with no bone in the skeleton, no bony fin rays, and no bony plate scales. Unlike sharks and rays (Elasmobranchii), chimaeras (Holocephalii) have only 4 pairs of gill openings on the sides of the head, which are hidden by a pair of soft gill covers that extend to the bases of the pectoral fins and form a single external gill opening on each side of the head. Chimaeras have prominent, large eyes on the sides of the head but no spiracles; the mouth is small, ventral, and connected to the nostrils by a pair of deep grooves, which serve to channel water from the nostrils to the mouth for respiration; the teeth in the mouth are formed into two pairs of ever-growing tooth plates in the upper jaw and one pair in the lower jaw, which unlike sharks and rays are not serially replaced; these protrude from the mouth like rodent's incisors, and have suggested the names rattfish or rabbitfish for some of the species. The pectoral fins are broad, leaf-shaped, and with a delicate external fin web supported by connective tissue fin rays ceratotrichia; the pectorals serve to propel these fishes slowly through the water; all chimaeras have 2 dorsal fins, the first erectile, with a slender, toxic spine and the second long and spineless; an anal fin is either present or absent. The tail of chimaeras is elongated and tapering, with a sharklike, asymmetrical (heterocercal) or straight, leaf-shaped (diphycercal) caudal fin, often with a long terminal filament extending beyond the fin. All living chimaeras have virtually naked skin, except for a few dermal denticles on the back and along the lateral line canals in some species and on the claspers and tentacula of males. The canals of the lateral line system on the head and sides of the body and tail are superficial in the skin and very prominent, unlike sharks and rays where they are more or less hidden under the skin. Male chimaeras have a pair of cylindrical or forked copulatory organs or claspers on their pelvic fins, used for internal fertilization of the eggs of females; adult males additionally have a pair of denticle-studded grasping organs, the prepelvic tentaculæ, just in front of the pelvic fin bases, and a knocker-like, denticle-covered frontal tentaculum on the forehead; these structures aid the male in grasping the female during copulation. Chimaeras are oviparous, depositing eggs on the bottom in long-necked, spindle or bottle-shaped egg cases, with a pair of narrow or broad, delicate side fins variably developed. Mature chimaeras vary in length from about 40 to 200 cm, the females being generally larger than males.

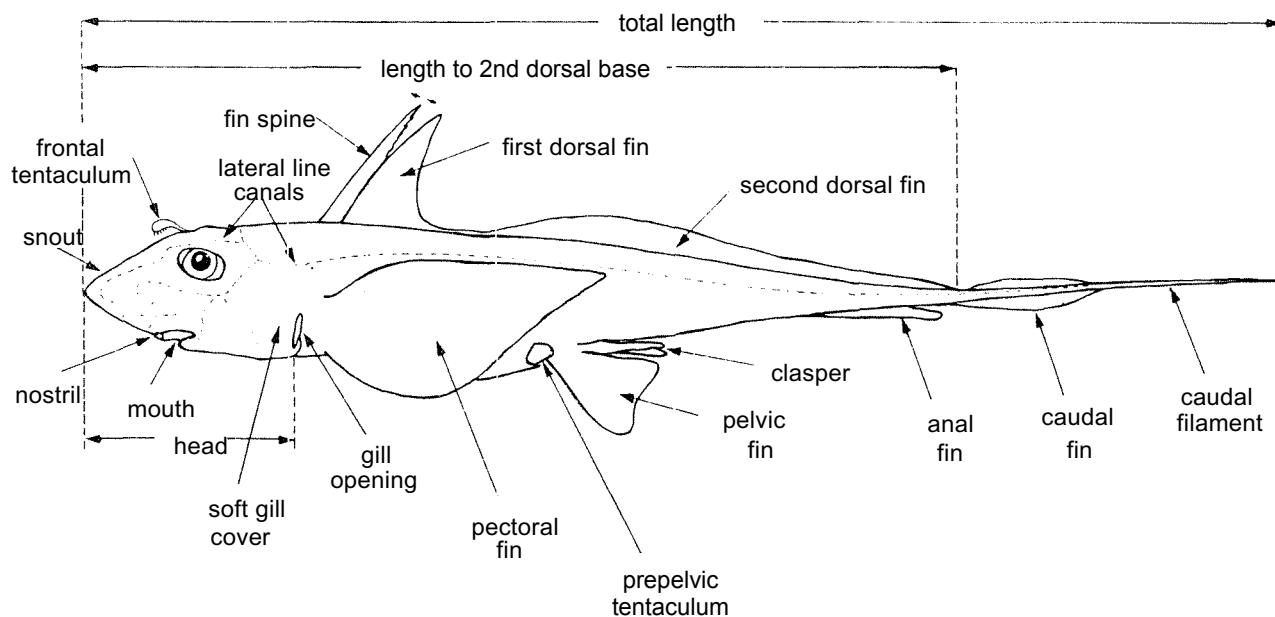


diagram of a male chimaera

(Chimaera)

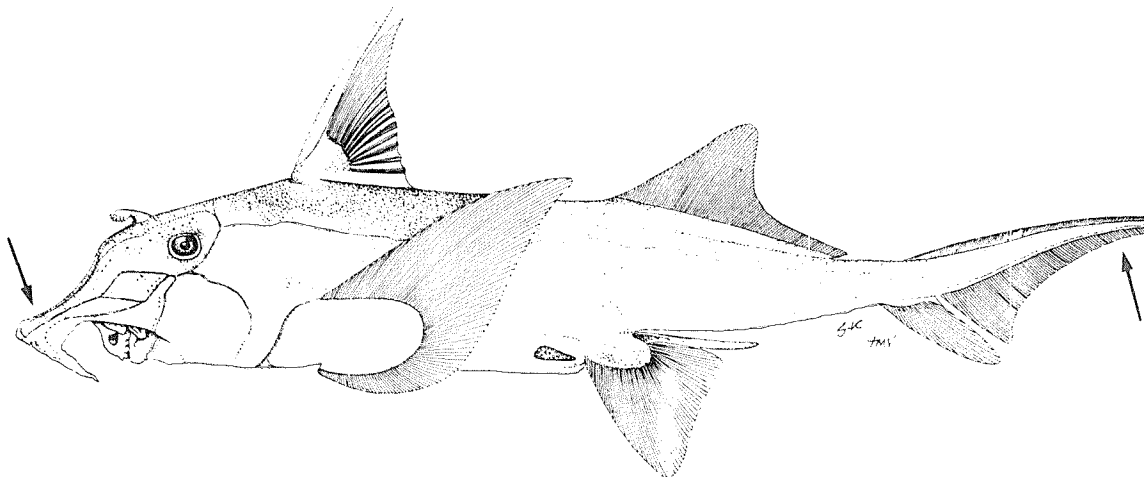
Chimaeras are predators on small bottom invertebrates and small fishes. which are crushed or cut up by their tooth plates. These fishes are entirely marine and have their greatest diversity on the upper continental and insular slopes. down to at least 2 600 m. but some species are common on continental and insular shelves. from well offshore on the outer shelf to inside shallow bays and in the intertidal. Chimaeras are widely, although spottily distributed in all oceans, from arctic and subantarctic waters to the tropics. All occur on or usually near the bottom close to land; none are oceanic.

The Western Indian Ocean has a relatively undiverse chimaera fauna, with all 3 families but only 3 of the 6 genera and 3 of the approximately 29 to 34 species occurring in the area. This is probably a result of poor sampling in the area, and it is likely that new discoveries of chimaeras will be made in Fishing Area 51 with further trawling on the continental slopes below 200 m depth. Basic knowledge of the biology of most chimaeras is extremely limited, and can be added to by fisheries workers in the area working aboard offshore trawlers.

In the Western Indian Ocean, chimaeras are apparently little utilized, although occasionally taken in trawls. They are suitable for human consumption, can be processed for oil and fishmeal, and yield a fine quality from their livers of use for lubricating machinery.

**KEY TO FAMILIES, GENERA AND SPECIES REPORTED FROM THE AREA**

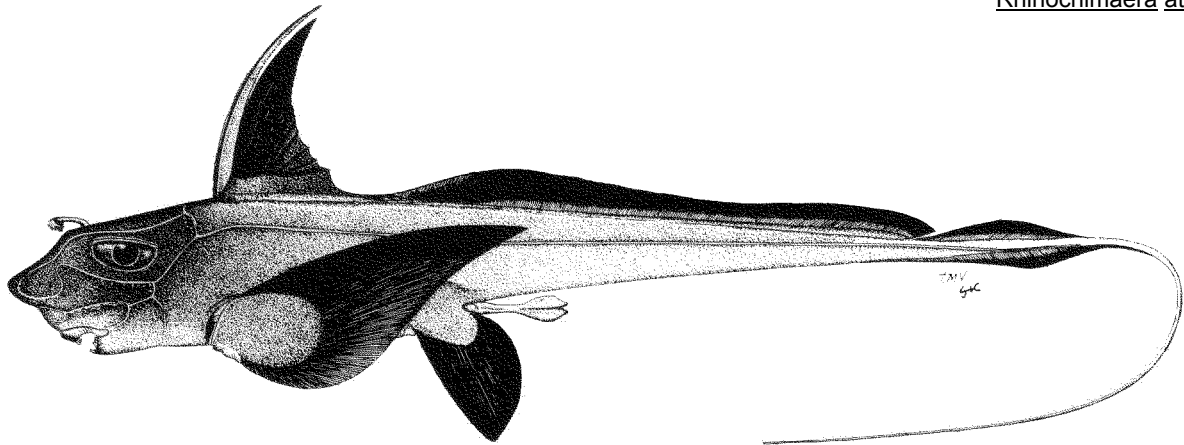
- 1a. Snout with a hoe-shaped terminal lobe; caudal fin with axis bent upward (heterocercal) and with a strong ventral lobe (Fig.1) ..... Family Callorhynchidae (Callorhynchus)  
Callorhynchus capensis
- 1b. Snout rounded, conical, flattened or pointed. not hoe-shaped; caudal fin with a horizontal axis (diphycercal) and no ventral lobe



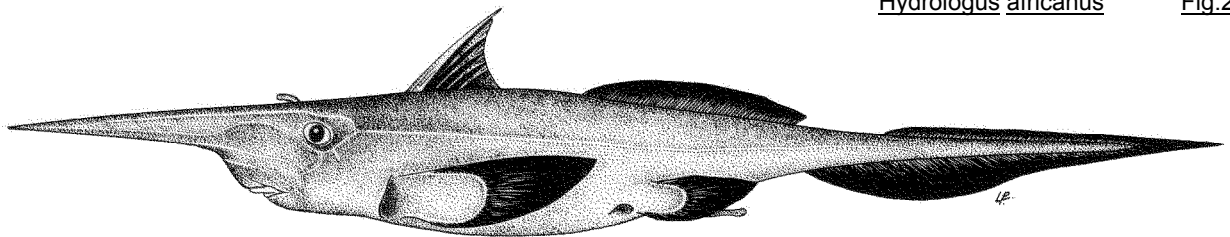
Callorhynchus capensis

Fig.1

- 2a. Snout short, rounded or conical (Fig.2) ..... Family Chimaeridae  
Hydrolagus africanus
- 2b. Snout elongate, pointed and more or less flattened (Fig.3) ..... Family Rhinochimaeridae  
Rhinochimaera atlantica



Hydrolagus africanus Fig.2



Rhinochimaera atlantica Fig.3

**LIST OF FAMILIES AND SPECIES OF CHIMAERAS OCCURRING IN THE AREA**

CALLORHINCHIDAE - Elephant fishes                      CALL

Callorhinchus capensis Dumeril, 1865

RHINUCHIMAERIDAE - Longnose chimaeras              RHIN

Rhinochimaera atlantica Halt & Byrne, 1909

CHIMAERIDAE - Shortnose chimaeras                      CHIM

\*Hydrolagus africanus (Gilchrist, 1922)

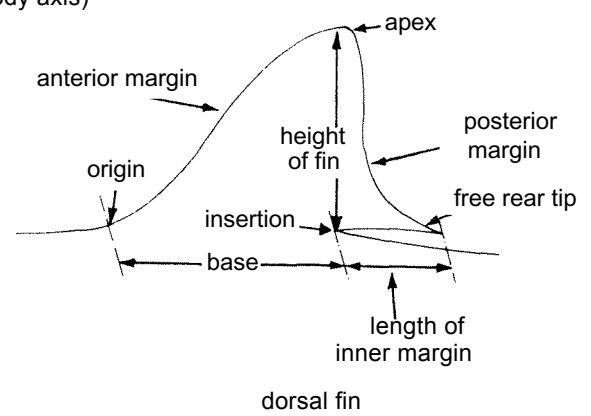
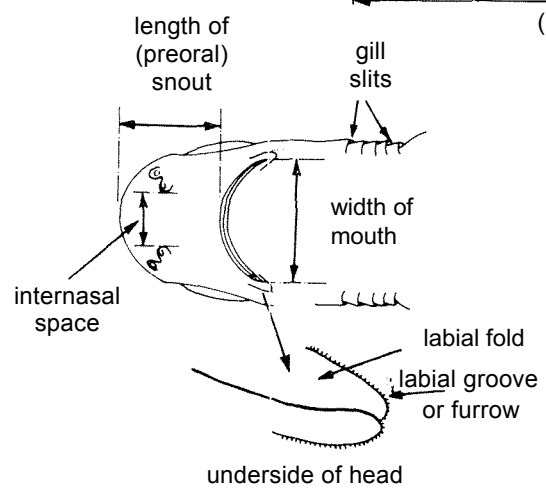
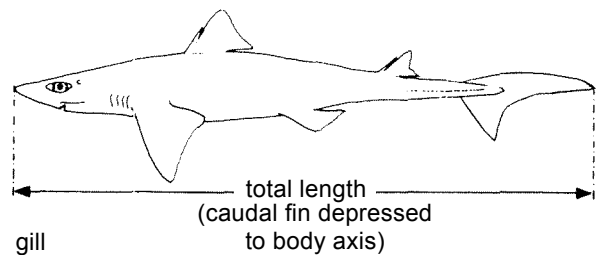
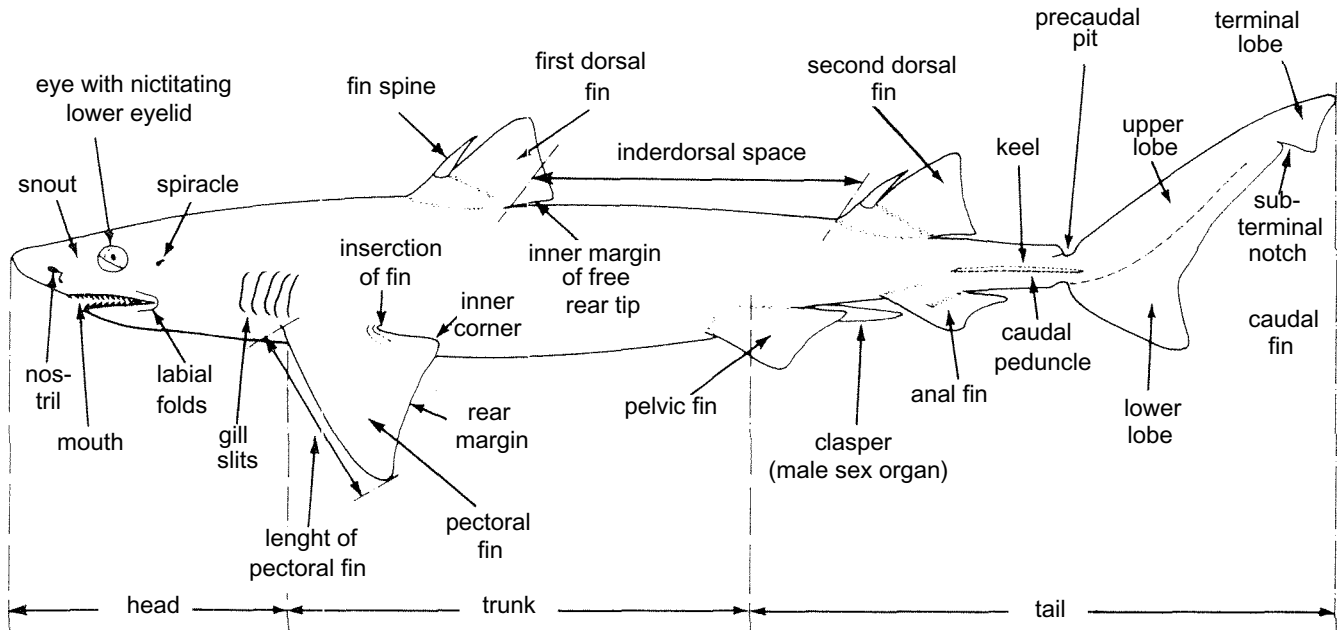
Prepared by Leonard J.V. Compagno, Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, California, U.S.A.

\* In addition, there are one or two additional representatives of Hydrolagus in the area, apparently representing new species



## TECHNICAL TERMS AND PRINCIPAL MEASUREMENT USED

(Straight-line distances)



### GENERAL REMARKS

Sharks include a variety of usually cylindrical, elongated, or moderately depressed fishes which differ from the closely related rays or batoids in having lateral gill openings (or gill slits) and pectoral fins not fused to the sides of the head over the gill openings. The greatly depressed angel sharks (Family Squatinidae) might be mistaken for rays at first sight; they have large, broad, raylike pectoral fins that extend as triangular lobes alongside the gill openings, but are not connected to the head above them. Sharks have eyes on the dorsal surface or sides of the head and spiracles (when present) on its dorsal or dorsolateral surfaces. The tail and caudal fin are always well developed and serve to propel the animal by lateral undulations; the pectoral fins are not used for propulsion through the water but aid in stabilizing and steering the shark. There are usually 5 gill openings on each side of the head, rarely 6 or 7. The mouth is usually ventral or subterminal on the head, but terminal or nearly so in a few species. Most sharks have two (rarely one) dorsal fins, sometimes with spines on their front edges; an anal fin is usually present, but, missing in several families. The teeth on the jaws are set in numerous transverse rows and are constantly replaced from inside the mouth. All shark species are more or less covered by small (occasionally enlarged) toothlike placoid scales or dermal denticles. Male sharks have cylindrical copulatory organs or claspers on their pelvic fins, used for internal fertilization of eggs in females; about 1/4 of the species of sharks have females that deposit eggs in rectangular or conical capsules, formed of a hornlike material, on bottom (oviparity); the remainder are livebearers. Some livebearing sharks, including some houndsharks (Triakidae), most requiem sharks (Carcharhinidae), and all weasel sharks (Hemigaleidae) and hammerheads (Sphyrnidae) are viviparous (placental viviparous), with yolk sacs of fetuses forming a placenta with the maternal uterus for nutrient transfer; other livebearing sharks are ovoviviparous (aplacental viviparous), without a placenta. Ovoviviparous sharks of the families Odontaspidae, Alopiidae, Lamnidae, Pseudocarchariidae, and presumably also the Mitsukurinidae practice uterine cannibalism, in which one or more fetuses in each uterus resorb their yolk sacs and then devour eggs passed down the oviducts for nutriment and grow to considerable size before birth.

Mature sharks vary in total length from about 15 to 19 cm (dwarf species of Squalidae and Proscylliidae) to 12.1 m or more (whale shark, Family Rhiniodontidae) and in weight from between 10 and 20 g to several metric tons. Most sharks are of small or moderate size; about 50 percent are small, between 15 cm and 1 m; 32 percent 1 or 2 m; 14 percent between 2 to 4 m; and 4 percent over 4 m in total length.

All sharks are predators, with their prey ranging widely, from planktonic crustaceans and benthic invertebrates to pelagic cephalopods, small to large bony fishes, other sharks and rays, marine mammals, and other vertebrates. They are primarily marine, but a few requiem sharks (Carcharhinidae) have broad salinity tolerances, and one species (bull shark, *Carcharhinus leucas*) is wide-ranging in tropical lakes and rivers with sea access as well as shallow inshore waters. Sharks are widely distributed in all oceans, from the Arctic to subantarctic islands, and from close inshore on reefs, off beaches, and in shallow, enclosed bays to the lower continental slopes, possibly to abyssal plains, and the high seas. They are most diverse in continental waters of tropical and warm-temperate seas, from inshore waters down to upper continental slopes, but are less so in colder waters, at greater depths, in the open ocean and off oceanic islands. The richest shark faunas occur in the Indo-West Pacific from South Africa and the Red Sea to Australia and Japan (including FAO Fishing Area 51).

The Western Indian Ocean and Red Sea have an extremely diverse shark fauna, including 23 families, 62 genera, and at least 115 species. Worldwide there are 30 families, 96 genera, and about 350 species of sharks. Many genera and families are poorly known and require further taxonomic study. New species have been commonly collected in deep-water habitats in the past thirty years, and more undoubtedly will be discovered with further collecting in poorly known areas. Knowledge of the coastal shark fauna of the Area 51 beyond the Red Sea and its southwestern corner (tropical South Africa, southern Mozambique, and the west coast of Madagascar) is very sketchy, and many maritime countries need further surveys to determine which species occur there. The deep-water shark fauna is very poorly known, except locally (e.g., Aldabra Island). Basic knowledge of the biology of many species is often very deficient or entirely lacking, and can be supplemented by new information gathered by fisheries workers in the Area.

The shark attack hazard has been grossly exaggerated in recent years. Large carcharhinids, sphyrnids and lamnids, and less frequently other sharks, pose a potential threat to people in the water or boats. Measures to reduce the number of potentially dangerous sharks in the vicinity of popular bathing beaches in South Africa have been successful in reducing shark attacks; the Natal Anti-Shark Measures Board has used large gillnets set opposite beaches for many years as attack prevention devices following Australian practice. About 9 percent of known shark species are definitely known to be dangerous, and about 10 percent more are large enough and sufficiently well-armed to be potentially so; the rest are mostly too small and poorly armed to be a hazard to people.

In the Western Indian Ocean and Red Sea sharks are used mainly for human food; shark meat is marketed fresh, frozen and especially dried-salted: sharks are also processed at sea and their meat is canned. Sharks are utilized on the oriental market for fins; also for liver oil, fishmeal, and possibly for leather, although details of



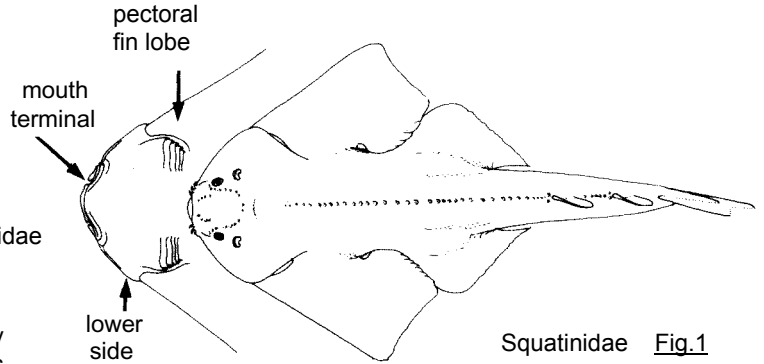
utilization in the area are sketchy. The total catch of sharks reported from Fishing Area 51 in 1980 was 50 745 metric tons; the actual landings of sharks in the area are doubtlessly much higher. Data on gear used in the area is sketchy, but line gear (including pelagic longlines), fixed and floating gillnets, bottom trawls, and purse seines are used to catch sharks. Sharks are taken in artisanal fisheries, by local inshore and offshore commercial fisheries, and by large fishing fleets in offshore waters. Requiem sharks (Carcharhinidae) are especially important, but considerable numbers of threshers (Alopiidae) are fished offshore, and a number of other families, including sand tiger sharks (Odontaspidae), longtailed carpetsharks (Hemiscylliidae), zebra sharks (Stegostomidae), weasel sharks (Hemigaleidae), and hammerheads (Sphyrnidae) are commonly taken in inshore fisheries.

**KEY WITH PICTURE GUIDE TO FAMES OCCURRING IN THE AREA**

1a. No anal fin (Figs 1 to 4)

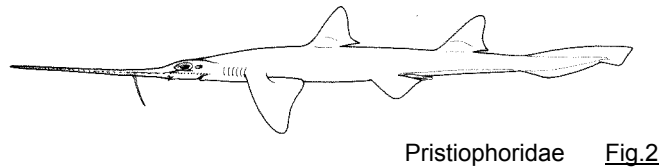
2a. Body strongly depressed and raylike; pectoral fins greatly enlarged, with anterior triangular lobes that overlap gill slits; mouth terminal (Fig.1) ..... Squatinidae

2b. Body cylindrical, compressed, or slightly depressed, not raylike; pectoral fins small, without anterior lobes; mouth ventral



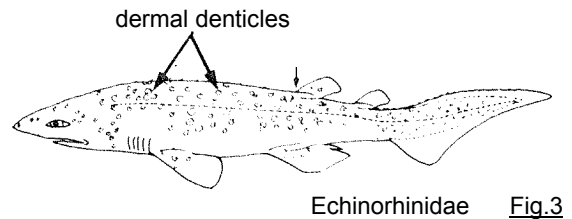
3a. Snout flattened and elongated, sawlike (Fig.2) ..... Pristiophoridae

3b. Snout normal, not sawlike

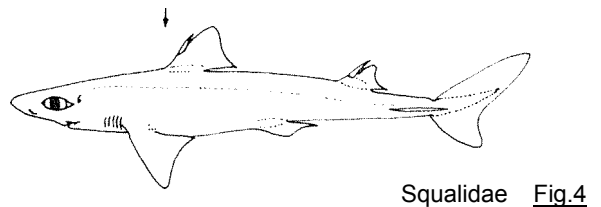


4a. First dorsal fin behind pelvic fin origins; dermal denticles expanded as large plates \* (Fig.3) ..... Echinorhinidae

4b. First dorsal fin partially or entirely in front of pelvic fin origins (Fig.4); dermal denticles not expanded as large plate ..... Squalidae



1b. Anal fin present



\* Character applying to Western Indian Ocean representatives only

5a. Only one dorsal fin, far posterior on back; 6 or 7 gill slits on each side (Figs 6,7,9,10)

6a. Mouth nearly terminal (Figs.6,7); teeth alike in both jaws, 3-cusped, not formed as cutting blades (Fig.5); body slender and eel-shaped (Fig.6); a fold of skin uniting lower ends of first pair of gill slits across throat (Fig.7) ..... Chtamydoselachidae

6b. Mouth ventral (Fig.10); teeth unlike in both jaws, uppers with a strong cusp and cusplets, lowers formed as large, comb-like, cutting blades with a cusp and several cusplets (Fig.8); body stouter, not eel-shaped (Fig.9); no fold of skin across throat (Fig.10) ..... Hexanchidae

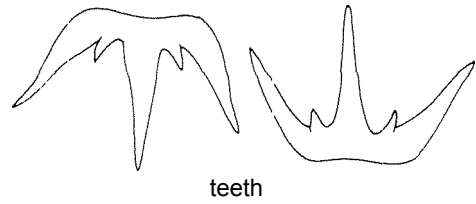
5b. Two dorsal fins\*; 5 gill slits on each side

7a. A strong spine on each dorsal fin (Fig.11) ..... Heterodontidae

7b. Dorsal fins without spines

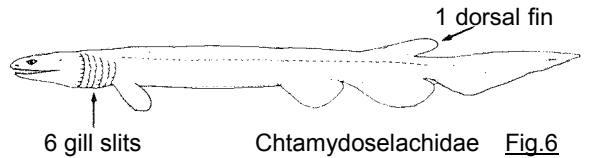
8a. Head with lateral expansions or blades, like a double-edged ax (Fig.12) ..... Sphyrnidae

8b. Head normal, not expanded laterally



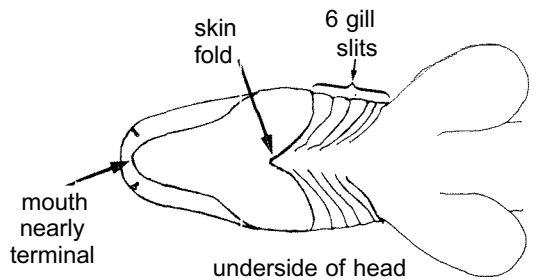
teeth

Chtamydoselachidae Fig.5



6 gill slits

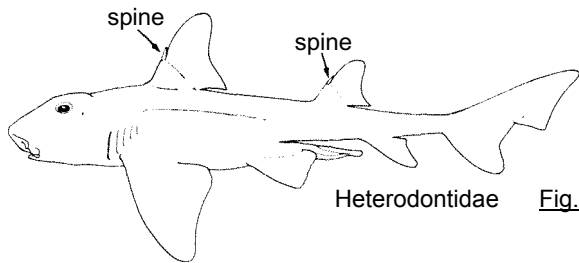
Chtamydoselachidae Fig.6



mouth nearly terminal

underside of head

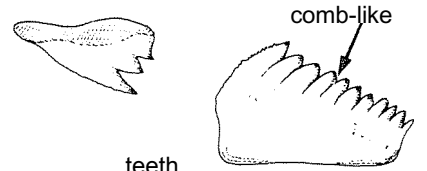
Chtamydoselachidae Fig.7



spine

spine

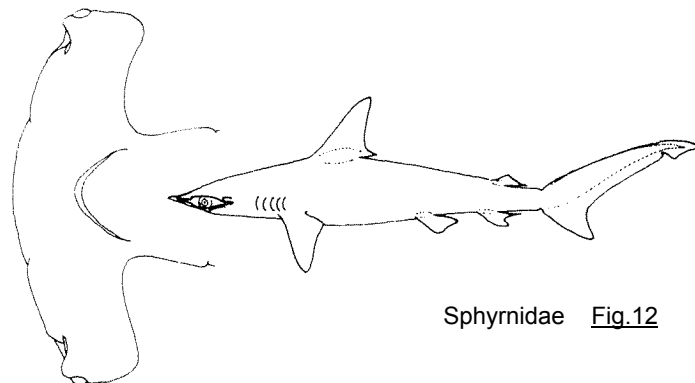
Heterodontidae Fig.11



teeth

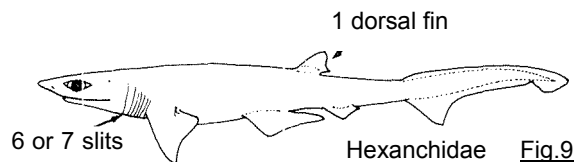
comb-like

Hexanchidae Fig.8



Sphyrnidae Fig.12

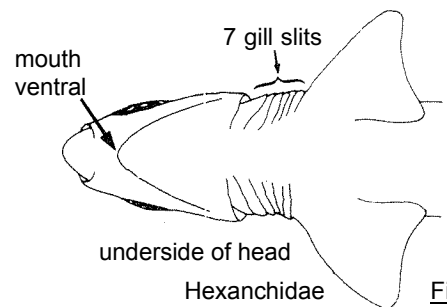
enlarged underside of head



6 or 7 slits

1 dorsal fin

Hexanchidae Fig.9



mouth ventral

7 gill slits

underside of head

Hexanchidae Fig.10

\*Character applying to Western Indian Ocean representatives only

9a. Eyes behind mouth; deep nasoral grooves connecting nostrils and mouth (Fig.13a)

10a. Caudal fin about as long as rest of shark (Fig.14) ..... Stegostomatidae

10b. Caudal fin less than half the length of rest of shark

11a. Mouth huge and terminal, head strongly depressed; gill slits very large, internal gill slits with filter screens; lowest ridge on sides of body ending in a strong keel on caudal peduncle; ventral caudal lobe string (Fig.15); a checkerboard pattern of light spots and stripes on head and body ..... Rhinodontidae

11b. Mouth small subterminal, head cylindrical or moderately depressed; gill slits small, internal gill slits without filter screens; ridges either absent from body or not forming a strong keel on caudal peduncle when present; ventral caudal lobe absent. or weak; body plain or spotted, but without a checkerboard pattern of light stripes and spots

12a. A lobe and groove around outer edge of each nostril (Fig.16a); spiracles large; precaudal tail long, subequal or greater than snout-vent length; anal fin low and keel-like (Fig.17) ..... Hemiscylliidae

12b. No lobe and groove around outer edge of nostril (Fig. 16b); spiracles small; precaudal tail shorter, its length from vent to lower caudal origin much less than distance from snout tip to vent; anal fin high and subangular (Fig.18) ..... Ginglymostomatidae

9b. Eyes partly or entirely over mouth; nasoral grooves usually absent (Fig.13b), when present (Haploblepharus and Atelomycterus in Family Scyliorhinidae and Scylliogaleus in Family Triakidae) broad and shallow

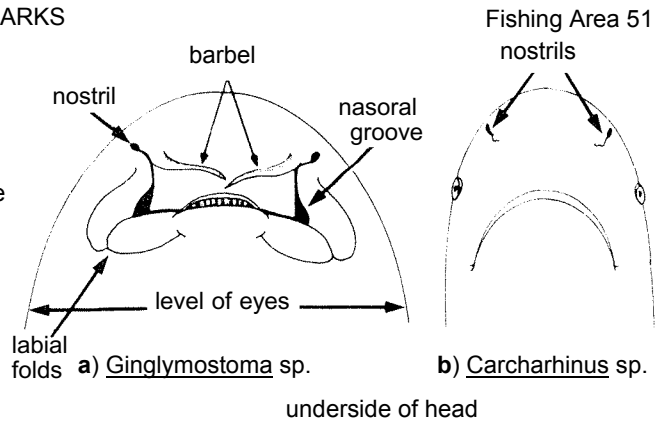
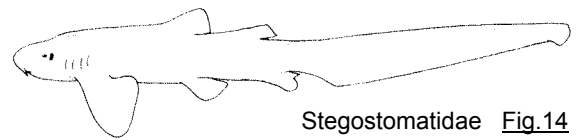
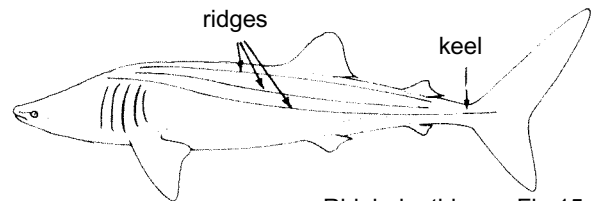


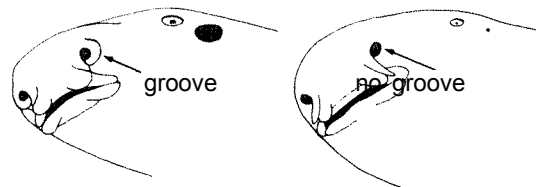
Fig.13



Stegostomatidae Fig.14



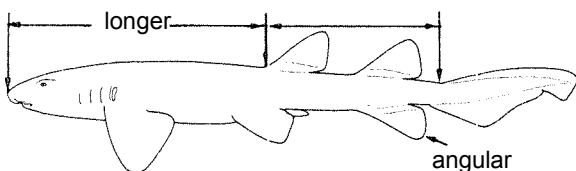
Rhinodontidae Fig.15



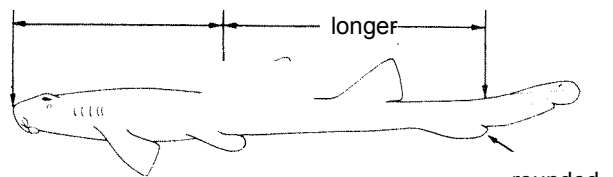
underside of snout

a) Hemiscylliidae b)Ginglymostomatidae

Fig.16

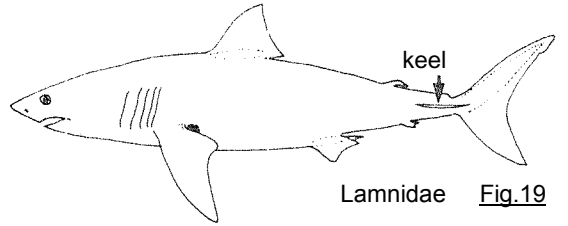


Ginglymostomatidae Fig.18



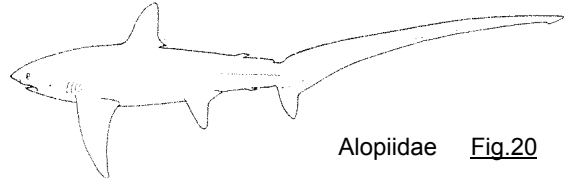
Hemiscylliidae Fig.17

13a. A strong keel present on each side of caudal peduncle; caudal fin crescentic and nearly symmetrical, with a long lower lobe (Fig.19)..... Lamnidae



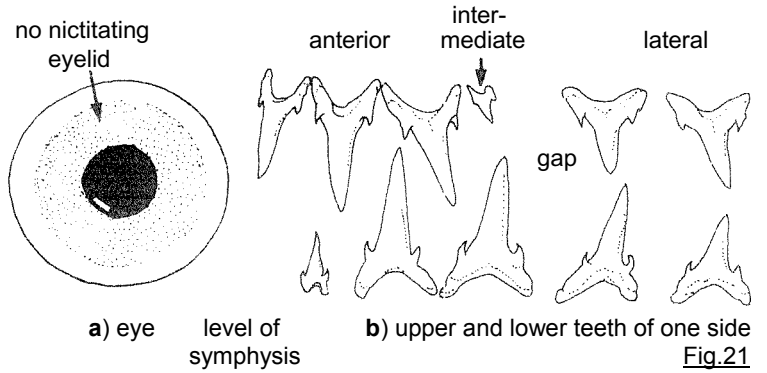
13b. No keels on caudal peduncle, or weak ones (*Pseudocarcharias* in Pseudocarchariidae, *Caleocerdo* and *Prionace* in Carcharhinidae ; caudal fin asymmetrical, not crescentic, with ventral lobe relatively short or absent

14a. Caudal fin about as long as rest of shark (Fig.20) ..... Alopiidae

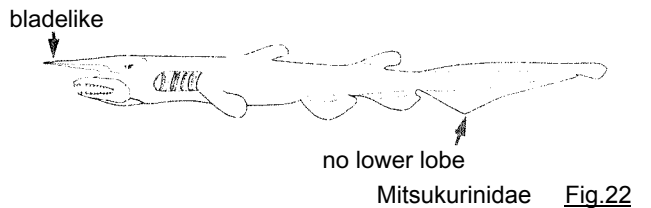


14b. Caudal fin less than half the length of rest of shark

15a. No nictitating eyelids (Fig. 21a), largest teeth in mouth are 2 or 3 rows of anterior on either side of symphysis (anterior junction of lower jaws); upper anterior separated from large lateral teeth at sides of jaw by a gap that may have one or more rows of small intermediate teeth (Fig.21b); all gill slits in front of pectoral fins (Figs 22 to 24)

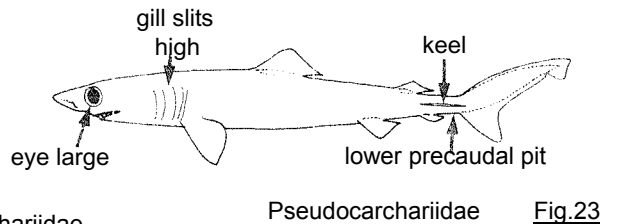


16a. Snout greatly elongated, flattened and bladelike; pectoral, pelvic, dorsal and anal fins with broadly rounded apices; no precaudal pits; no lower caudal fin lobe (Fig.22) ..... Mitsukurinidae



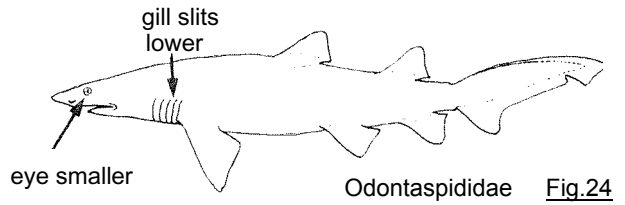
16b. Snout moderately elongated, conical or moderately flattened, not bladelike; pectoral, pelvic, dorsal and anal fins with narrowly rounded apices; precaudal pits present: lower caudal fin lobe present (Figs 23.24)

17a. Eyes very large; gill slits extending onto upper surface of head; both upper and lower precaudal pits present; a low keel on each side of caudal peduncle (Fig.23) .... Pseudocarchariidae



17b. Eyes smaller; gill slits not extending onto upper surface of head; lower pre-caudal pits absent; no keels on caudal peduncle (Fig.20) ..... Odontaspidae

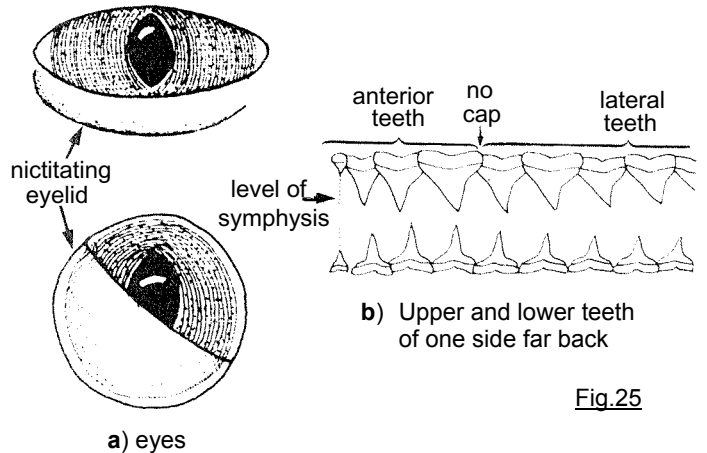
15b. Nictitating eyelids present (Fig.25a); largest teeth in mouth are well lateral on dental band, not on either side of symphysis; no gap or intermediate teeth separating large anterior teeth from still larger lateral teeth in upper jaw (Fig.25b); last one or two gill slits over pectoral fin bases



18a. Origin of first dorsal fin over or behind pelvic fin bases (Fig.26) ..... Scyliorhinidae

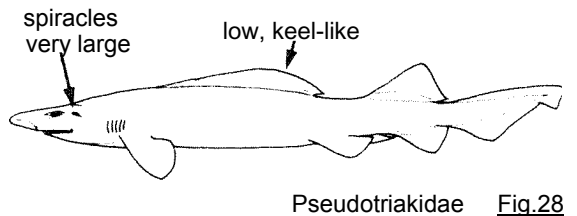
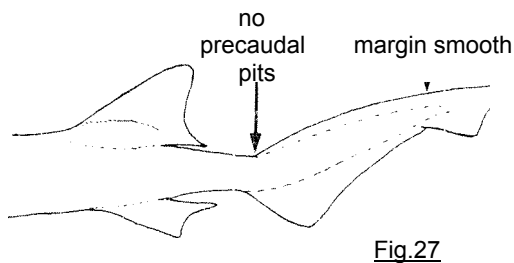
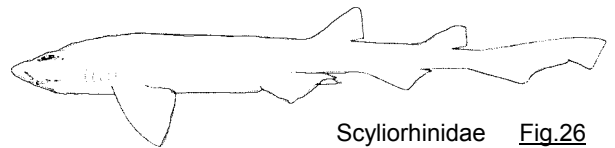
18b. Origin of first dorsal fin well ahead of pelvic fin bases

19a. No pre-caudal pits, dorsal caudal fin margin smooth (Fig.27)



20a. First dorsal fin long, about the length of caudal fin, and formed as a low, rounded keel; adults with over 200 rows of teeth in each jaw; spiracles nearly or quite as long as eyes (Fig.28) ..... Pseudotriakidae

20b. First dorsal fin short, about two-thirds of caudal fin or less\*, sub-triangular in shape; adults with less than 110 rows of teeth in each jaw; spiracles much smaller than eyes



\*Character applying to Western Indian Ocean representatives only

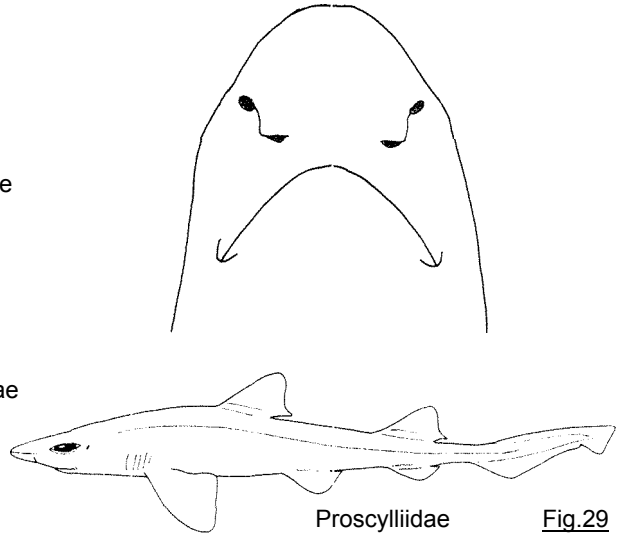
21 a. Labial furrows very short or absent, confined to extreme mouth corners; palate and gill arches with papillae\*; posterior teeth comblike; base of first dorsal fin closer to pelvic fin bases than to pectoral fin bases (Fig.29) ..... Proscylliidae

21 b. Labial furrows longer, extending anteriorly for a greater or lesser distance on lips; palate and gill arch without papillae; posterior teeth not comblike; base of first dorsal fin either equidistant between pectoral and pelvic bases or closer to pectoral fin bases (Fig.30) ..... Triakidae

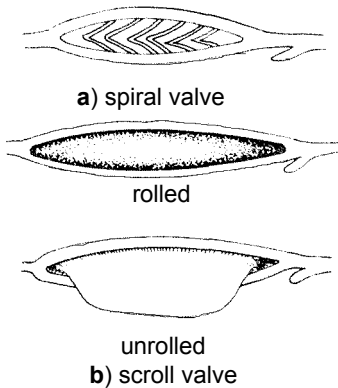
19b. Precaudal pits and rippled dorsal caudal margin present (ripples sometimes irregular in Scoliodon and Triakonodon of Family Carcharhinidae)(Fig.31

22a. Intestine with a spiral valve (Fig.32a) having 4 to 6 turns ..... Hemigaleidae (Fig.33)

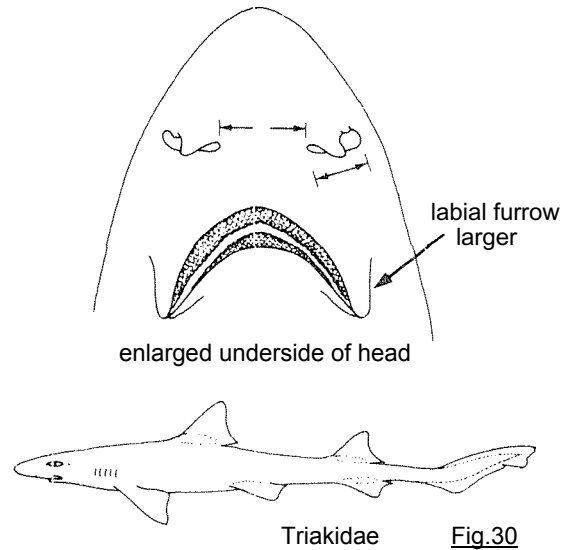
22b. Intestine with a scroll valve (Fig.32b) ..... Carcharhinidae (Fig.34)



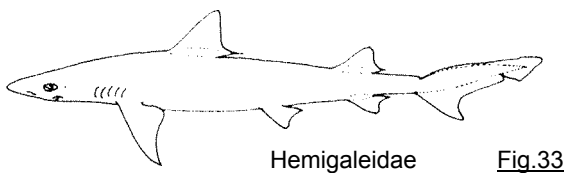
Proscylliidae **Fig.29**



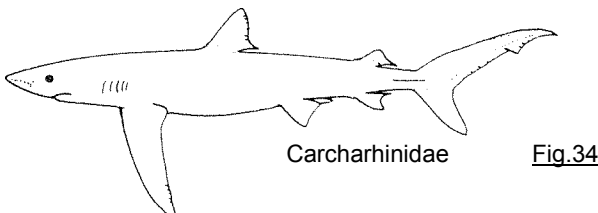
**Fig.32**



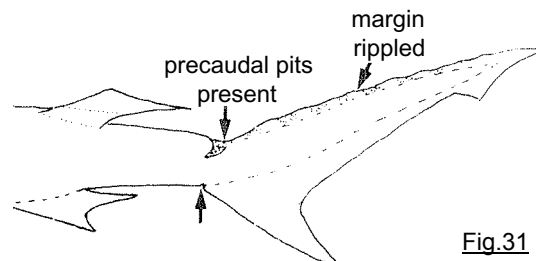
Triakidae **Fig.30**



Hemigaleidae **Fig.33**



Carcharhinidae **Fig.34**



**Fig.31**

\*Character applying to Western Indian Ocean representatives only

## LIST OF SPECIES OCCURRING IN THE AREA

Code numbers are given for those families and species for which Identification Sheets are included

CHLAMYDOSELACHIDAE : Frilled sharks	CHLAM
<u>Chlamydoselachus anguineus</u> Garman, 1884	CHLAM Chlam 1
HEXANCHIDAE : Sixgill and sevengill sharks, cow sharks	HEX
<u>Heptanchias perlo</u> (Bonnaterre, 1788)	HEX Hept 1
<u>Hexanchus griseus</u> (Bonnaterre, 1788)	HEX Hex 1
<u>Hexanchus nakamurai</u> Teng, 1962	HEX Hex 2
? <u>Notorynchus cepeduanus</u> (Peron, 1807)	HEX Noto 1
ECHINORHINIDAE : Bramble sharks	ECHIN
<u>Echinorhinus brucus</u> (Bonnaterre, 1788)	ECHIN Echin 1
SQUALIDAE : Dogfish sharks	SQUAL
<u>Centrophorus granulosus</u> (Bloch & Schneider, 1801)	SQUAL Centrop 1
<u>Centrophorus lusitanicus</u> Bocage & Capello, 1864	SQUAL Centrop 2
<u>Centrophorus moluccensis</u> Bleeker, 1856	SQUAL Centrop 5
<u>Centrophorus squamosus</u> (Bonnaterre, 1788)	SQUAL Centrop 3
<u>Centrophorus uyato</u> (Rafinesque, 1810)	SQUAL Centrop 4
<u>Centroscyllium ornatura</u> (Alcock, 1889)	
<u>Centroscyrnus crepidater</u> (Bocage & Capello, 1864)	SQUAL Centros 2
<u>Dalatias licha</u> (Bonnaterre, 1788)	SQUAL Dal 1
<u>Deania profundorum</u> (Smith & Radcliffe, 1912)	
<u>Deania quadrispinosum</u> (McCulloch, 1915)	SQUAL Dean 2
<u>Etmopterus Lucifer</u> Jordan & Snyder, 1902	
<u>Etmopterus sentosus</u> Bass, D'Aubrey & Kistnasamy, 1976	
<u>Euprotomicrus bispinatus</u> (Quoy & Gaimard, 1824)	
<u>Heteroscymnoides marleyi</u> Fowler, 1934	
<u>Isistius brasiliensis</u> (Quoy & Gaimard, 1824)	
<u>Scymnodon obscurus</u> (Vaillant, 1888)?	
<u>Squaliolus laticaudus</u> Smith & Radcliffe, 1912	
<u>Squalus asper</u> Merrett, 1973	SQUAL Squal 5
<u>Squalus megalops</u> (Macleay, 1881)	SQUAL Squal 4
<u>Squalus mitsukurii</u> Jordan & Snyder, in Jordan & Fowler, 1903	SQUAL Squal 6

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? Presence in area uncertain

FAO Sheets

SHARKS

Fishing Area 51

PRISTIOPHORIDAE : Saw sharks	PRISTIOP
<u>Pliotrema warreni</u> Regan, 1906	PRISTIOP Plio 1
<u>Pristiophorus</u> sp.	
SQUATINIDAE : Angel sharks	SQUAT
<u>Squatina africana</u> Regan, 1908	SQUAT Squat 5
HETERODONTIDAE : Bullhead shark	HEY
<u>Heterodontus ramalheira</u> (Smith, 1949)	NET Het 1
HEMISCYLLIIDAE : Longtail carpetsharks	HEMIS
<u>Chiloscyllium arabicum</u> Gubanov, in Gubanov & Shleib, 1980	
<u>Chiloscyllium caerulopunctatum</u> Pellegrin, 1914	
<u>Chiloscyllium gryseum</u> Müller & Henle, 1839	HEMIS Chilo 1
<u>Chiloscyllium indicum</u> (Gmelin, 1789)	HEMIS Chilo 2
? <u>Chiloscyllium plagiosum</u> (Bennett, 1830)	
? <u>Chiloscyllium punctatum</u> Müller & Henle, 1839	
STEGOSTOMATIDAE : Zebra sharks	STEG
<u>Stegostoma fasciatura</u> (Hermann, 1783)	STEG Steg 1
GINGLYMOSTOMATIDAE : Nurse sharks	GINGL
<u>Ginglymostoma brevicaudatum</u> Günther, in Playfair & Günther, 1866	GINGL Gingl 2
<u>Nebrius ferrugineus</u> (Lesson, 1830)	GINGL Nei) 1
RHINIODONTIDAE : Whale sharks	RHIN
<u>Rhiodon typus</u> Smith, 1828	RHIN Rhir 1
ODONTASPIDIDAE : Sand tiger sharks	ODONT
<u>Eugomphodus taurus</u> (Rafinesque, 1810)	ODONT Eug 1
?? <u>Eugomphodus tricuspidatus</u> (Day, 1878)	
<u>Odontaspis ferox</u> (Risso, 1810)	ODONT Odont 1
? <u>Odontaspis noronhai</u> (Maul, 1955)	
PSEUDOCARCHARIIDAE : Crocodile sharks	PSEUD
<u>Pseudocarcharias kamoharai</u> (Matsubara, 1936)	PSEUD Pseud 1
MITSUKURINIDAE : Goblin sharks	MITSU
<u>Mitsukurina owstoni</u> Jordan, 1898	MITSU Mitsu 1

? Presence in area uncertain

?? Dubious species, possibly a synonym of E. taurus



FAO Sheets

SHARKS

Fishing Area 51

ALOPIIDAE : Thresher sharks

ALOP

Alopias pelagicus Nakamura, 1936  
Alopias superciliosus (Lowe, 1839)  
Alopias vulpinus (Bonnaterre, 1788)

ALOP Alop 3  
ALOP Atop 1  
ALOP Alop 2

LAMNIDAE : Mackerel sharks

LAMN

Carcharodon carcharias (Linnaeus, 1758)

LAMN Car 1

Isurus oxyrinchus Rafinesque, 1810  
Isurus paucus Guitart, 1966

LAMN Isur 1  
LAMN Isur 2

Lamna nasus (Bonnaterre, 1788)

LAMN Lamn 1

SCYLIORHINIDAE : Catsharks

SCYL

Apristurus indicus (Brauer, 1906)

Atelomycterus marmoratus (Bennett, .1830)

SCYL Atel 1

Cephaloscyllium sufflans (Regan, 1921)  
Cephaloscyllium silasi (Talwar, 1974)

Halaelurus alcocki Garman, 1913  
Halaelurus boesemani Springer & D'Aubrey, 1972  
Halaelurus hispidus (Alcock, 1891)  
Halaelurus lineatus Bass, D'Aubrey & Kistnasamy, 1975  
Halaelurus lutarius Springer & D'Aubrey, 1972  
Halaelurus natalensis (Regan, 1904)  
Halaelurus cuagga (Alcock, 1899)  
Haploblepharus edwardsii (Voigt, in Cuvier, 1832)  
Haploblepharus fuscus Smith, 1950  
Holohalaelurus punctatus (Gilchrist, 1914)  
Holohalaelurus regani (Gilchrist, 1922)  
Poroderma africanum (Gmelin, 1789)  
Poroderma marleyi Fowler, 1934  
Poroderma pantherinum (Smith, in Müller & Henle, 1838)  
Scyliorhinus capensis (Smith, in Müller & Henle, 1838)

PROSCYLLIIDAE : Finback catsharks

PROS

Ctenacis fehlmani (Springer, 1968)

Eridacnis radcliffei Smith, 1913  
Eridacnis sinuans (Smith, 1957)

PSEUDOTRIAKIDAE : False catsharks

PSEUDOT

Pseudotriakis microdon Capello, 1868

PSEUDOT Pseu 1

TRIAKIDAE : Houndsharks	TRIAK
? <u>Galeorhinus galeus</u> (Linnaeus, 1758)	
<u>Hypogaleus hyugaensis</u> (Miyosi, 1939)	TRIAK Hypo 1
<u>Iago omanensis</u> (Norman, 1939)	TRIAK Iago 1
<u>Iago</u> sp.	
<u>Mustelus manazo</u> Bleeker, 1854	TRIAK Must 6
<u>Mustelus mosis</u> Hemprich & Ehrenberg, 1899	TRIAK Must 7
<u>Scylliogaleus queckettii</u> Boulenger, 1902	TRIAK Scyl 1
? <u>Triakis megalopterus</u> (Smith, 1849)	
HEMIGALEIDAE : Weasel sharks	HEMIG
<u>Chaenogaleus macrostomus</u> (Bleeker, 1852)	HEMIG Cheen 1
<u>Hemigaleus microstomus</u> Bleeker, 1852	HEMIG Hemig 1
<u>Hemipristis elongatus</u> (Klunzinger, 1871)	HEMIG Hemip 1
* <u>Paragaleus</u> sp.	
CARCHARHINIDAE : Ground or requiem sharks	CARCH
<u>Carcharhinus albimarginatus</u> (Rüppell, 1837)	CARCH Carch 17
<u>Carcharhinus altimus</u> (Springer, 1950)	CARCH Carch 2
<u>Carcharhinus amblyrhynchoides</u> (Whitley, 1934)	CARCH Carch 18
<u>Carcharhinus amblyrhynchos</u> (Bleaker, 1856)	CARCH Carch 19
<u>Carcharhinus amboinensis</u> (Müller & Henle, 1839)	CARCH Carch 14
<u>Carcharhinus brachyurus</u> (Günther, 1870)	CARCH Carch 15
<u>Carcharhinus brevipinna</u> (Müller & Hanle, 1839)	CARCH Carch 3
<u>Carcharhinus dussumieri</u> (Valenciennes, in Müller & Henle, 1839)	CARCH Carch 20
<u>Carcharhinus falciformis</u> (Bibron, in Müller & Hanle, 1839)	CARCH Carch 24
<u>Carcharhinus galapagensis</u> (Snodgrass & Heller, 1905)	CARCH Carch 16
<u>Carcharhinus hemiodon</u> (Valenciennes, in Müller & Henle, 1839)	CARCH Carch 21
<u>Carcharhinus leucas</u> (Valenciennes, in Müller & Henle, 1839)	CARCH Carch 6
<u>Carcharhinus limbatus</u> (Valenciennes, in Müller & Henle, 1839)	CARCH Carch 7
<u>Carcharhinus longimanus</u> (Poey, 1661)	CARCH Carch 8
<u>Carcharhinus macloti</u> (Müller & Henle, 1839)	CARCH Carch 22
<u>Carcharhinus melanopterus</u> (Quoy & Gaimard, 1824)	CARCH Carch 23
<u>Carcharhinus obscurus</u> (LeSueur, 1818)	CARCH Carch 9
<u>Carcharhinus plumbeus</u> (Nardo, 1827)	CARCH Carch 11
<u>Carcharhinus sealei</u> (Pietschmann, 1916)	CARCH Carch 24
<u>Carcharhinus sorrah</u> (Valenciennes, in Müller & Henle, 1839)	CARCH Carch 25
<u>Carcharhinus wheeleri</u> Garrick, 1982	CARCH Carch 26
<u>Galeocerdo cuvieri</u> (Peron & LeSueur, in LeSueur, 1822)	CARCH Gal 1
<u>Glyphis gangeticus</u> (Müller & Henle, 1839)	CARCH Glyp 1
<u>Lamiopsis temmincki</u> (Müller & Henle, 1839)	CARCH Lamnio 1
<u>Loxodon macrorhinus</u> Müller & Henle, 1839	CARCH Lox 1

? Presence in area uncertain

\* An undescribed species, to be named by the writer, occurring in the Arabian Sea south to southeastern India and probably Sri Lanka, and possibly off Madagascar (where it was ascribed to the Atlantic Paragaleus, P. pectoralis). It is taken in the Indian shark fishery and marketed fresh for human consumption

<u>Negaprion acutidens</u> (Rüppell, 1837)	CARCH Neg 2
<u>Prionace glauca</u> (Linnaeus, 1758)	CARCH Prion 1
<u>Rhizoprionodon acutus</u> (Rüppell, 1837)	CARCH Rhiz 3
<u>Rhizoprionodon oligolinx</u> Springer, 1964	CARCH Rhiz 4
<u>Scoliodon laticaudus</u> Müller & Henle, 1838	CARCH Scol 1
<u>Triaenodon obesus</u> (Rüppell, 1837)	CARCH Tria 1

SPHYRNIDAE : Hammerheads

SPHYRN

<u>Eusphyra blochii</u> (Cuvier, 1817)	SPHYRN Eus 1
<u>Sphyrna lewini</u> (Griffith & Smith, in Cuvier, Griffith & Smith, 1834)	SPHYRN Sphyrn 1
<u>Sphyrna mokarran</u> (Rüppell, 1837)	SPHYRN Sphyrn 3
<u>Sphyrna zygaena</u> (Linnaeus, 1758)	SPHYRN Sphyrn 4

Note: Basic knowledge of the biology of many species is often very deficient or entirely lacking, and fishery workers can contribute much new information on this subject. If possible, representative material of rare or uncommon species should be forwarded to large national museum collections, and basic information, such as total length, weight, sex, maturity, stomach contents, locality of capture, date, collector, method of collection, depth of capture, as well as photographs of the sharks in side, top and bottom views, should be recorded. Difficulties with the keys, or the possible use of better field characters, should be brought to the attention of the author, so that modifications can be made in subsequent versions of this section. Problems might also arise from the occurrence, in the area, of previously unrecorded species, new species, or variations within species not taken into consideration in the present keys and species accounts.

Prepared by L.J.V. Compagno, Tiburon Center of Environmental Studies, San Francisco State University, Tiburon, California, U.S.A.

## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

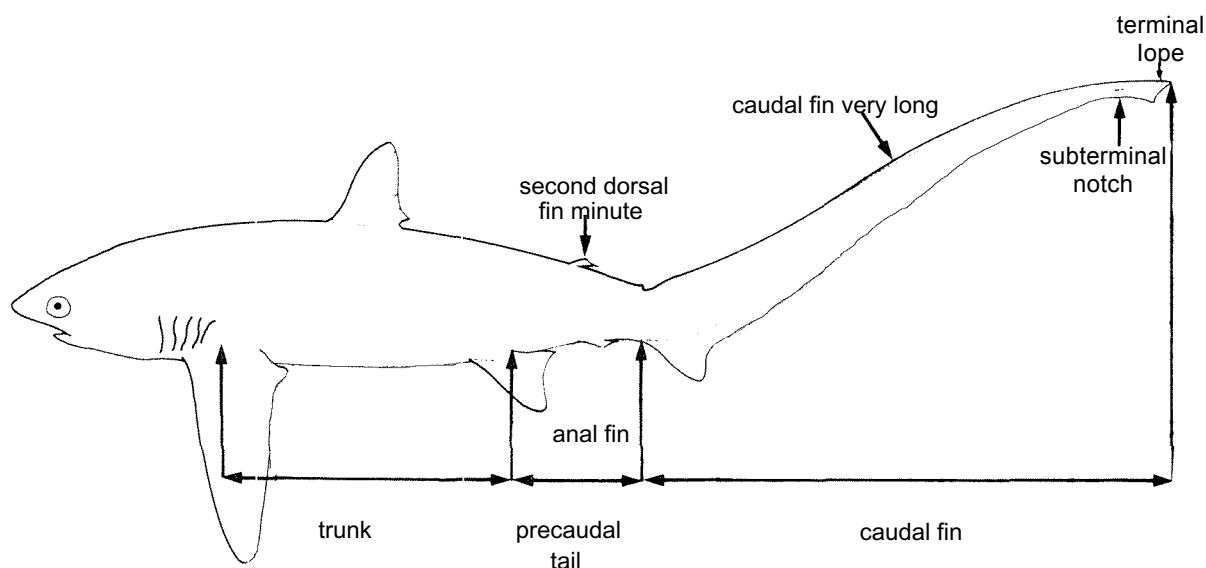
## ALUPIIDAE

## Thresher sharks

Large sharks. Trunk and precaudal tail cylindrical, not depressed and without lateral ridges; precaudal tail much shorter than trunk. Head not expanded laterally, not depressed; 5 small to medium-sized gill slits present, the last 2 behind pectoral fin origins, their ripper ends not expanded onto upper surface of head; no gillrakers or sieves on internal gill slits; spiracles present and minute; nostrils without barbels, nasoral grooves, or circumnarial grooves, well separated from mouth; eyes on sides of head, without nictitating lower eyelids; snout moderately long, bluntly conical, not flattened and without lateral teeth or barbels; mouth small but arched and elongated, extending well behind eyes; labial furrows present on lower jaw only or absent, when present not reaching front of mouth; teeth small, bladelike and compressed, with erect to oblique cusps and cusplets very small or absent; anterior teeth in upper jaw slightly larger than lateral teeth and sometimes separated from them by a row of smaller intermediate teeth on each side. Two dorsal fins, without spines, the first moderately large, high and angular, much shorter than the caudal fin, and with its base located over the interspace between pelvic and pectoral fin bases; second dorsal fin low, minute, and less than one-tenth the size of the first dorsal; anal fin present, very small, with its origin under or behind the second dorsal fin insertion; caudal fin strongly asymmetrical, the upper lobe enormously enlarged, about half the total length and with a subterminal notch, and an undulated or rippled dorsal margin, the lower lobe short but strong; vertebral axis of caudal fin raised above body axis. Caudal peduncle not depressed, without keels; precaudal pits present. Intestinal valve of ring type.

Colour: bluish, blackish, grey or brown above, shading to white or grey below.

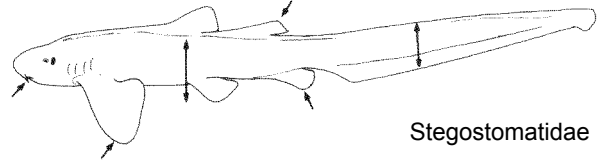
These are active, strong-swimming, pelagic, coastal and deepwater sharks, with the young of one species occurring close inshore and inside bays. They feed mainly on small to moderately large schooling fishes and squid, which may be herded and stunned by the long, straplike tail. The 3 species in Fishing Area 51 have been reported from South Africa, Tanzania, Somalia, Madagascar, Pakistan, and from the Red Sea, Gulf of Aden, Arabian Sea, and the Maldiv Islands and Chagos Archipelago, but are probably wide-ranging in the area. Threshers are circumtemperate and tropical in all warm oceans. In the area they are fished for meat (fresh, dried salted and processed for canning), primarily by offshore longline fisheries.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Stegostomatidae: this is the only other family of sharks with the caudal fin about as long as the body; it differs from Alopiidae in numerous characters, including its striped or barred colour pattern, nasal barbels, transverse mouth in front of eyes, small tricuspid teeth, broad rounded pectoral fins, first dorsal fin over pelvic bases, larger second dorsal and anal fins, broad upper lobe on caudal fin, no ventral caudal fin lobe, and axis of caudal fin not raised.

No other sharks have the caudal fin about as long as the body.

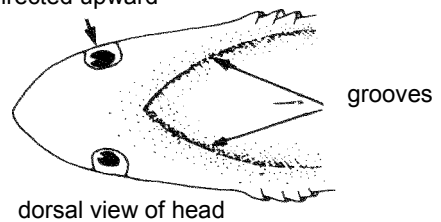


Stegostomatidae

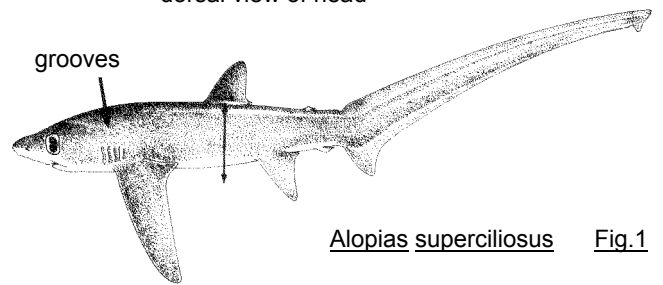
**KEY TO SPECIES OCCURRING IN THE AREA:**

- 1a. Eyes very large, with orbits expanded onto dorsal surface of head; teeth larger, less than 25 in each jaw; dorsal surface of head between eyes nearly flat; first dorsal fin closer to pelvic fins than to pectoral fins; a deep horizontal groove on nape on each side above gills (Fig.1) ..... Alopias superciliosus
- 1b. Eyes smaller, with orbits not expanded onto dorsal surface of head; teeth smaller, 29 or more in each jaw; dorsal surface of head between eyes strongly arched; first dorsal fin closer to pectoral fins than to pelvic fins; either no groove on nape or a weak one (Figs 2,3)
- 2a. Forehead broadly arched in lateral view, head broad; snout short; pectoral fins falcate, with narrow, pointed apices; white colour from belly expanded over pectoral fin bases (Fig.2) ..... Alopias vulpinus
- 2b. Forehead nearly straight in lateral view, head narrow; snout more elongated pectoral fins nearly straight, with broad, rounded apices; white colour from belly not expanded over pectoral fin bases (Fig.3) ..... Alopias pelagicus

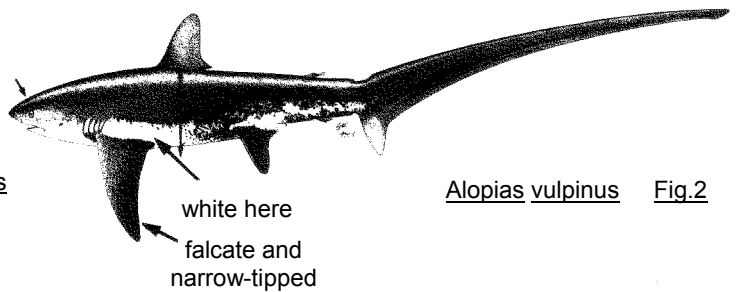
eyes directed upward



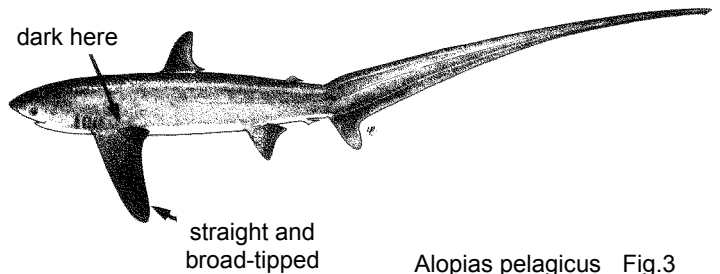
dorsal view of head



Alopias superciliosus Fig.1



Alopias vulpinus Fig.2



Alopias pelagicus Fig.3

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Alopias pelagicus Nakamura, 1936

ALOP Alop 3

Alopias superciliosus (Lowe, 1839)

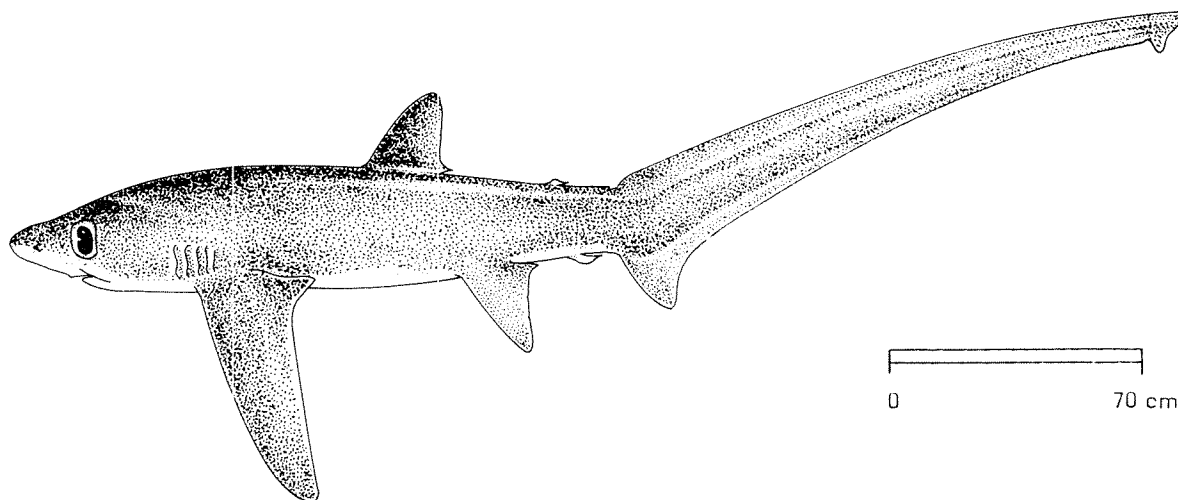
ALOP Alop 1

Alopias vulpinus Bonnaterre, 1788)

ALOP Alop 2

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ALOPIIDAE

FISHING AREA 51  
(W. Indian Ocean)*Alopias superciliosus* (Lowe, 1839)OTHER SCIENTIFIC NAMES STILL IN USE : *Alopias profundus* Nakamura, 1935

## VERNACULAR NAMES:

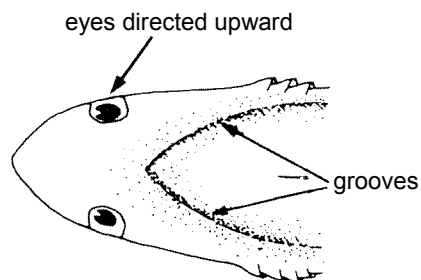
FAO : En - Bigeye thresher  
Fr - Renard à gros yeux  
Sp - Zorro oñón

NATIONAL:

## DISTINCTIVE CHARACTERS:

A large shark. Head with 5 medium-sized gill slits, the last 2 above pectoral fin bases; a deep horizontal groove on nape on each side from the level of mouth to pectoral fins; no nasal barbels or nasoral grooves on nostrils; snout moderately long and conical; profile of forehead distinctly indented over eyes; interorbital space nearly flat; no nictitating eyelids; eyes very large, expanding onto dorsal surface of head, permitting upward vision; mouth moderately long and semicircular, placed below the eyes, with rudimentary labial furrows; teeth moderately large, less than 25 rows in upper or lower jaws, sharp-edged, with a single, broad, straight or posteriorly curved cusp and no cusplets; anterior teeth not greatly enlarged, uppers not separated from the large laterals by smaller intermediate teeth. Two dorsal fins, the first moderately large and located just in front of the pelvic fin origins, closer to the pelvis than to the pectorals; second dorsal fin minute and positioned well ahead of the small anal fin; pectoral fins very narrow, long and falcate, broad-tipped; upper lobe of caudal fin very long and straplike, almost or quite equal to the length of rest of shark; lower lobe short but well-developed. Upper precaudal pit present but caudal keels absent. Intestinal valve of ring type.

Colour: purplish-grey above, cream below, posterior edges of pectorals, pelvis and sometimes first dorsal fin dusky; light colour of abdomen not expanded over pectoral fin bases.



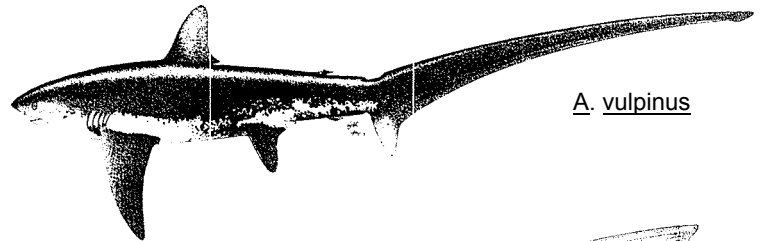
dorsal view of head

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

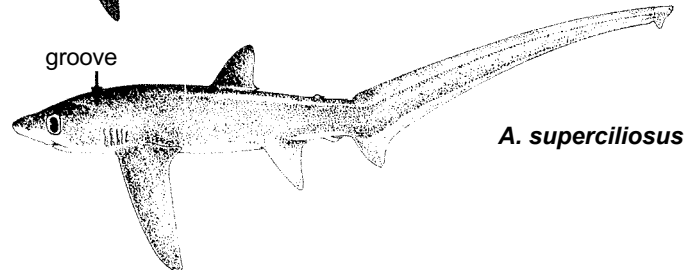
*Alopias pelagicus* and *A. vulpinus*: grooves on nape either poorly developed or absent; forehead broadly arched between eyes in anterior view; eyes not expanded onto dorsal surface of head; forehead not set off from nape by an indentation or notch; teeth smaller, over 29 rows in each jaw, usually with intermediate teeth between upper anteriors and laterals; first dorsal fin equidistant between pectoral and pelvic fins or closer to pectoral fins.

### SIZE:

Maximum: about 460 to 470 cm; most adults between about 300 to 400 cm.



*A. vulpinus*



*A. superciliosus*

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Found in the area off South and East Africa, Madagascar, and the Arabian Sea, and probably more wide-ranging than known records indicate. Elsewhere widely distributed in the warm-temperate to tropical Atlantic, and the West, Central and Eastern Pacific.

An oceanic species that may come close to the coast and occurs near the bottom and offshore at depths from 475 to 500 m. Ovoviviparous, usually with only 2 young, but possibly up to 4; size at birth probably about 100 to 130 cm.

Feeds on pelagic fishes (alepisaurids, clupeoids, scombrids, and small istiophorids), bottom-fishes (hake), and squid (the latter an important food for the species). Probably uses its tail to herd and stun prey as does *A. vulpinus*, as some individuals have been hooked on longlines by their tails. Apparently harmless to people.

### PRESENT FISHING GROUNDS:

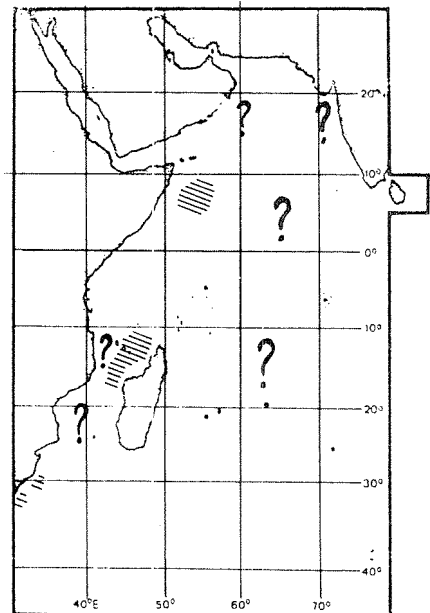
Offshore in the area, primarily off the southeastern coast of Somalia.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Taken with pelagic longlines.

Utilization uncertain, presumably frozen or canned.



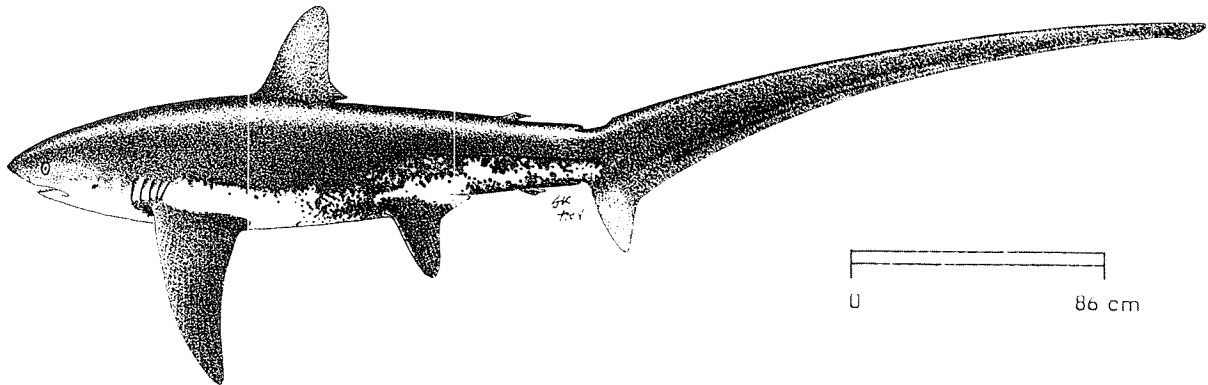


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ALOPIIDAE

FISHING AREA 51  
(W. Indian Ocean)*Alopias vulpinus* (Bonnaterre, 1788)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Thresher shark  
                  Fr - Renard  
                  Sp - Zorro

NATIONAL:

## DISTINCTIVE CHARACTERS:

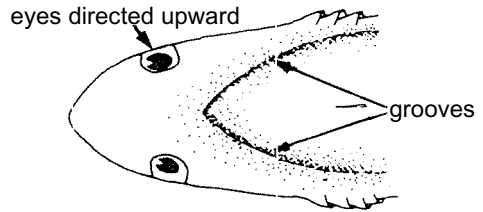
A large shark. Head with 5 medium-sized gill slits, the last two above pectoral fin bases; no grooves on nape; no gillrakers; no nasal barbels or nasoral grooves on nostrils; snout short and conical; forehead broadly convex in lateral view, not indented at nape; no nictitating eyelids; eyes moderately large, not expanding unto the dorsal surface of head; mouth short and semicircular, below eyes, with short lower labial furrows; teeth small, usually over 29 rows in upper and lower jaws, sharp-edged, with a single, broad, straight or posteriorly curved cusp and usually no cusplets; anterior teeth not greatly enlarged, uppers usually separated from the laterals by a small intermediate tooth. Two dorsal fins, the first moderately large, with its base well ahead of the pelvic fin bases and farther from them than from the pectoral fin bases; second dorsal fin minute and positioned just in front of the small anal fin; pectoral fins very long and falcate, with narrowly rounded (small juveniles) to acutely pointed, narrow tips; upper lobe of caudal fin very long and straplike, about as long as, or longer than, rest of shark; lower lobe short but well-developed. Upper precaudal pit present but caudal keels absent. Intestinal valve of ring type.

Colour: brown, grey, blue-grey or blackish on back and underside of snout, lighter on sides, and abruptly white below; a white area extends from the abdomen over the pectoral fin bases; pectoral, pelvic and dorsal fins blackish, white dots sometimes present on pectoral, pelvic and caudal fin tips.

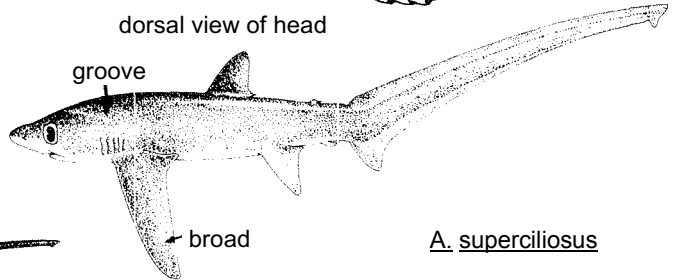
**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Alopias superciliosus: snout longer, forehead indented in lateral view, nearly flat between eyes in anterior view; head narrower; eyes much larger, expanded onto dorsal surface of head; mouth without well-developed lower labial furrows; teeth larger, in 20 to 24 rows in each jaw, without intermediate teeth between upper anteriors and laterals; first dorsal fin closer to pelvic fins than to pectorals; pectoral fins broad-tipped; white or light colour of abdomen not extending over pectoral bases.

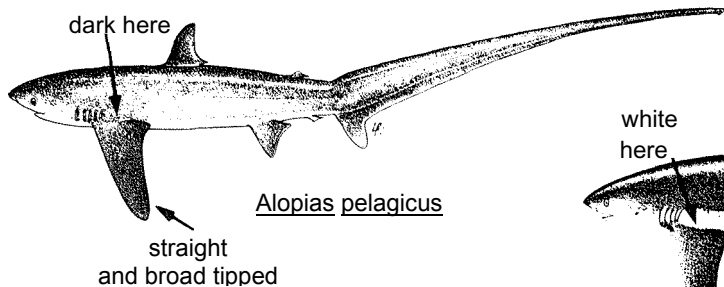
Alopias pelagicus: snout longer, forehead flatter in lateral view; head narrower; mouth without well-developed lower labial furrows; lateral teeth often with cusplets; pectoral fins nearly straight, not falcate, and broad-tipped; white of abdomen not extending over pectoral bases.



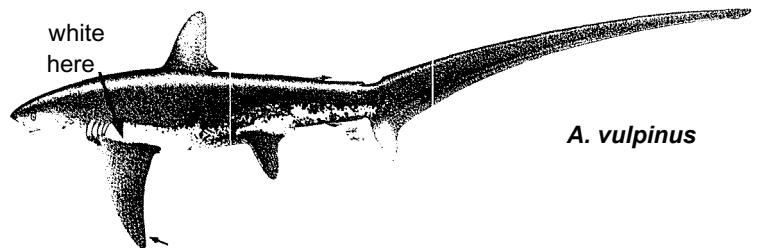
dorsal view of head



A. superciliosus



Alopias pelagicus



A. vulpinus

**SIZE:**

Maximum: between 500 and 609 cm; common between 430 and 490 cm; apparently larger than A. superciliosus and A. pelagicus.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, from South Africa, Tanzania, Somalia, the "Gulf"; Maldives, Chagos Archipelago, Gulf of Aden, India and Sri Lanka. Elsewhere, wide-ranging in the Atlantic, Indian Ocean and Pacific. Some Western Pacific and Indian Ocean records of this species may be based on A. pelagicus.

A cold-temperate to tropical, oceanic and coastal shark, the young of which are often found close inshore and in shallow bays. Apparently common off Somalia, the Maldives and Chagos Archipelago, where it is caught at depths from 180 to 265 m in waters 1 000 to 5 150 m deep. Oviviparous, number of young 2 to 4 (usually 2); size at birth about 120 to 152 cm.

This shark feeds mostly on small schooling fishes, including mackerel, bluefish, clupeids, needlefishes, lancetfishes and lanternfishes; also squids, octopi and pelagic crustaceans. Definitely recorded as herding and stunning fishes with its long tail, and in the area often caught by being tail-hooked, presumably after hitting the baited hook with its tail. A few attacks on boats are attributed to this species, but it otherwise is not known to be dangerous.

**PRESENT FISHING GROUNDS:**

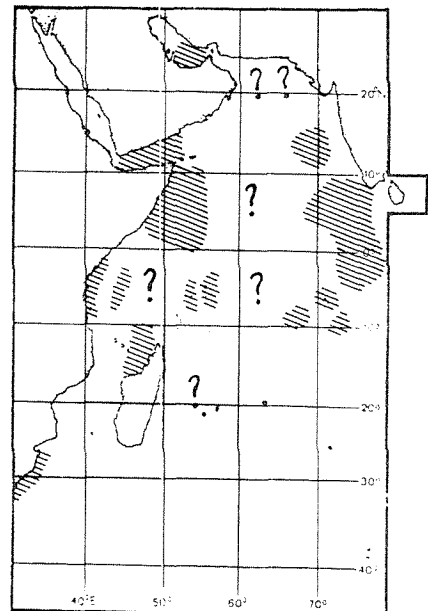
Offshore in the area, particularly off Somalia.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Captured on pelagic longline.

Utilization uncertain, presumably frozen or canned.

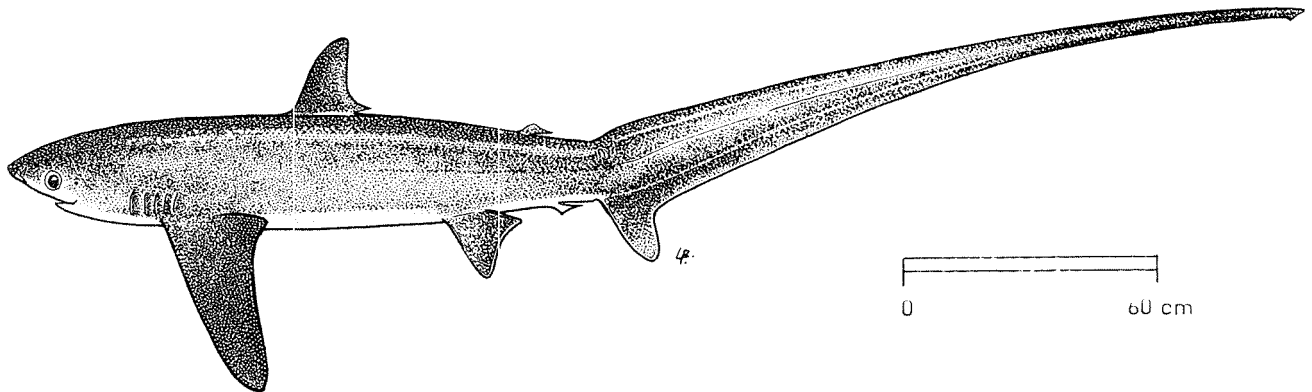


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ALOPIIDAE

FISHING AREA 51  
(W. Indian Ocean)*Alopias pelagicus* Nakamura, 1936

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Pelagic thresher  
                   Fr - Renard pélagique  
                   Sp - Zorro pelágico

NATIONAL:

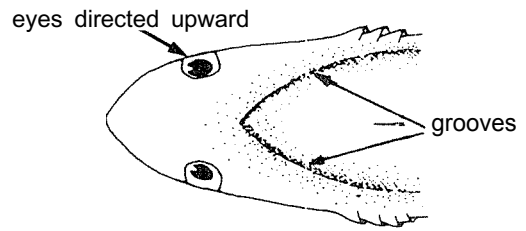
## DISTINCTIVE CHARACTERS:

A large shark. Head with 5 medium-sized gill slits, the last 2 above pectoral fin bases; a weak horizontal groove on nape on each side from level of mouth to pectoral fins; no nasal barbels or nasoral grooves on nostrils; snout moderately long and conical; forehead nearly straight in lateral view; broadly arched between eyes; head narrow; no nictitating eyelids; eyes moderately enlarged in adults and subadults but greatly enlarged in young, not expanded onto dorsal surface of head; mouth moderately long and semicircular, placed below eyes, with labial furrows rudimentary or absent; teeth small, more than 29 rows in each jaw, sharp-edged, with a single, narrow, nearly erect or distally oblique cusp and often a distal cusplet; anterior teeth not greatly enlarged, uppers separated from the large laterals by smaller intermediate teeth. Two dorsal fins, the first moderately large and located about equidistant between the pectoral and pelvic fin bases or slightly closer to the pectoral bases; second dorsal fin minute and positioned well ahead of the small anal fin; pectoral fins narrow, long and nearly straight, broad-tipped, and not falcate; upper lobe of caudal fin very long and straplike, about as long as the rest of the shark; lower lobe short but strong; terminal lobe very small. Upper precaudal pit present but caudal keels absent. Intestinal valve of ring type.

Colour: bluish or grey above, white below, with a silvery sheen in gill region; white colour from belly not handed over pectoral fin bases.

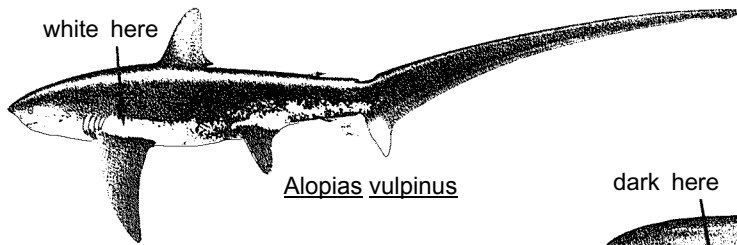
**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Alopias superciliosus: deep grooves on nape, forehead flat between eyes, set off from nape by a distinct indentation or notch; eyes larger in adults and subadults, in all sizes expanded onto dorsal surface of head; teeth larger, less than 25 rows in each jaw; no intermediate teeth; first dorsal fin closer to pelvic fins than to pectorals; pectoral fins falcate.

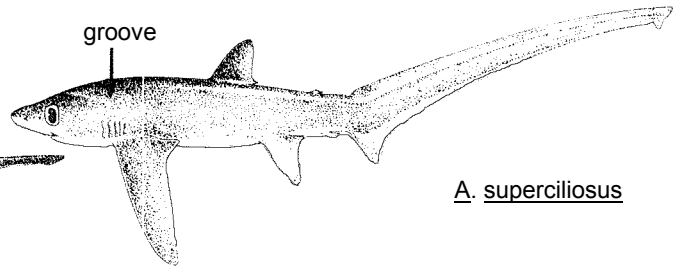


dorsal view of head

Alopias vulpinus: grooves absent from nape; snout shorter; head broader, forehead broadly arched in lateral view; labial furrows well-developed on lower jaw; teeth with more erect cusps; cusplets usually absent; pectoral fins falcate, with narrow, pointed tips; white colour of abdomen extending to above pectoral fin bases.



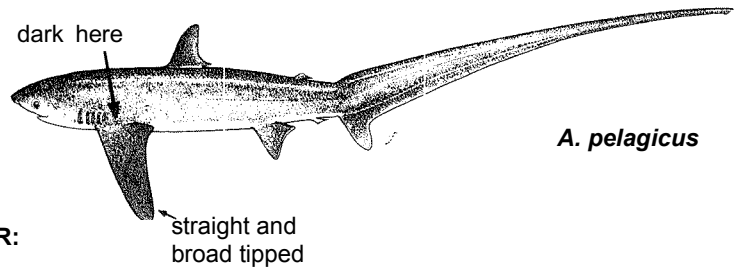
Alopias vulpinus



A. superciliosus

**SIZE:**

Maximum: at least 330 cm (adult females).



A. pelagicus

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Found in the area, off South Africa, in the Red Sea off Egypt, in the Arabian Sea between India and Somalia, and off Karachi, Pakistan. Elsewhere, known from the Western Pacific off China, Taiwan Island, Japan, and New Caledonia; the Central Pacific off the Hawaiian Islands; and the Eastern Pacific from the mouth of the Gulf of California to the Galapagos Islands.

A little-known oceanic species occurring at depths from 49 to 152 m, sometimes found near shore. Ovoviviparous, with at least 2 young, born at a length greater than 96 cm.

Presumably feeds on small fishes and pelagic invertebrates, but details unknown. Apparently harmless to people.

**PRESENT FISHING GROUNDS:**

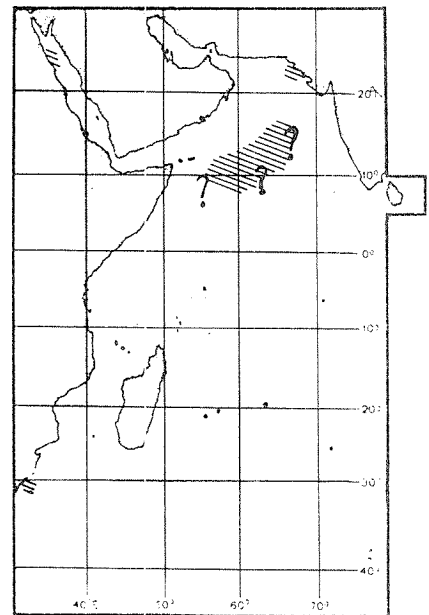
Mostly offshore waters, particularly in the Arabian Sea between Somalia and India.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :**

Separate statistics are not reported for this species.

Captured with longlines and on hook and line gear.

Probably utilized dried-salted, fresh and canned.



FAO SPECIES IDENTIFICATION SHEETS

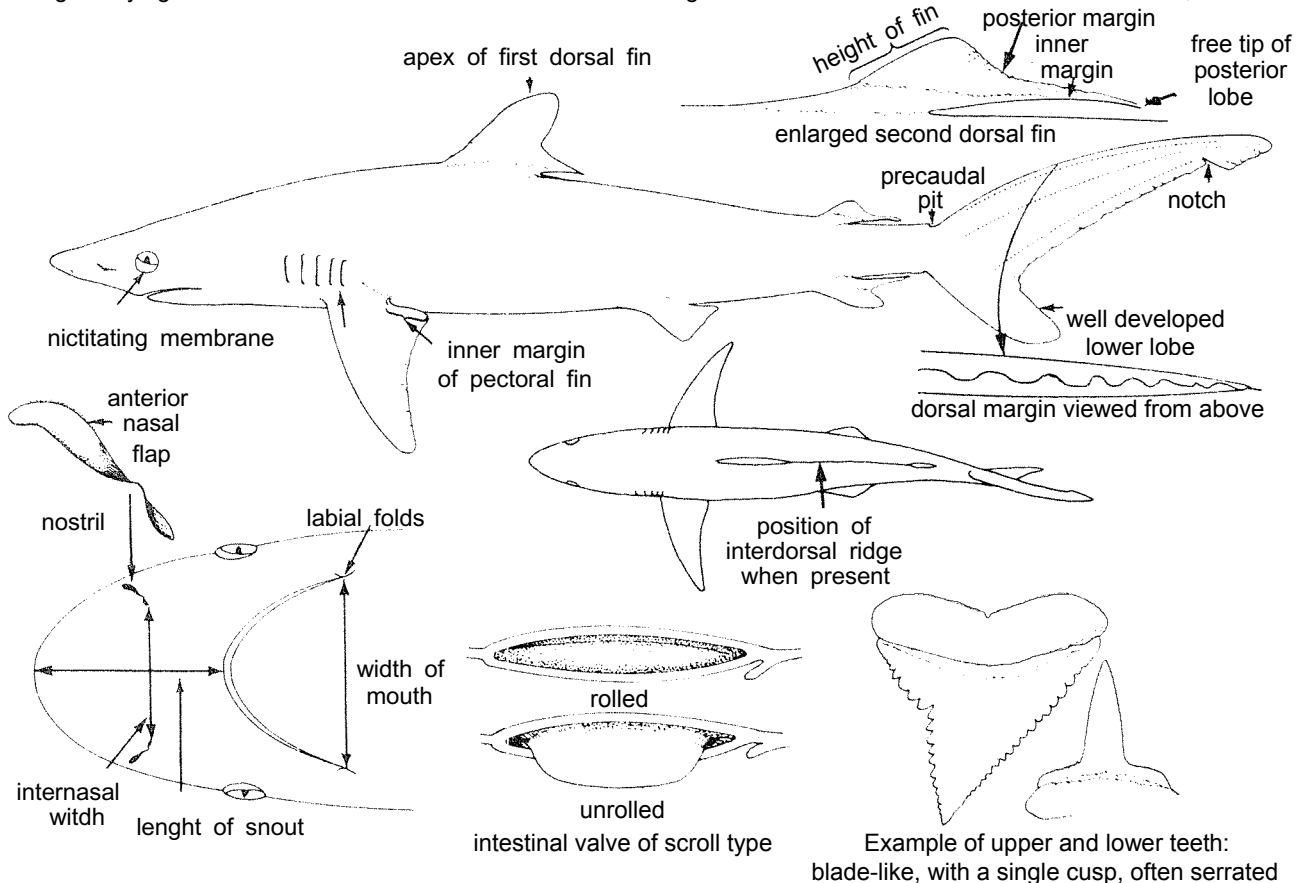
FISHING AREA 51  
(W. Indian Ocean)

CARCHARHINIDAE\*

Requiem sharks

(also, ground sharks, blue sharks, sharpnose sharks)

Small to large sharks. Trunk and precaudal tail cylindrical, not depressed and without lateral ridges; precaudal tail much shorter than trunk. Head not expanded laterally, conical to moderately depressed; 5 small- to medium-sized gill slits present, the last 1 to 3 over or behind pectoral fin origins, their upper ends not expanded onto dorsal surface of head; no gill sieves and usually no gillrakers on internal gill slits (short dermal gillrakers present in *Prionace*); spiracles usually absent (but always present in *Galeocerdo*); nostrils well-separated from mouth, without barbels, nasoral grooves, or circumnarial grooves; eyes on sides of head, with a well-developed nictitating lower eyelid; snout short to moderately long, conical and slightly pointed to depressed and broadly rounded, never greatly flattened and bladelike and without lateral teeth and barbels; mouth usually large, arched and elongated, and extending well behind eyes; labial furrows usually present on both jaws but generally greatly reduced, confined to mouth corners, and barely visible when mouth is closed (but *Galeocerdo* and some *Rhizoprionodon* species have well-developed labial furrows); upper labial furrows usually not reaching front of mouth (except in *Galeocerdo*); teeth small to large, blade-like, with a single cusp and cusplets variably developed; anterior teeth in upper jaw smaller than lateral teeth and not separated from them by smaller intermediate teeth on each side. Two dorsal fins, without spines, the first dorsal moderately large, high and angular or subangular, much shorter than the caudal fin, its base located over the interspace between pectoral and pelvic fin bases and entirely anterior to origins of pelvic fins (free rear tip of dorsal may reach or extend posterior to pelvic origins in *Scoliodon*, *Negaprion*, *Rhizoprionodon*, and *Triaenodon*); second dorsal fin varying from less than a fifth the height of the first dorsal to about as high as the first (*Lamiopsis* and *Negaprion*); anal fin present, moderately large, with its origin varying from somewhat anterior to the second dorsal origin to under the first half of second dorsal base;



\*Diagnosis applies only to Western Indian Ocean representatives

caudal fin strongly asymmetrical, much less than half of total length, with a rippled or undulated dorsal margin, a well-marked subterminal notch, and a short but well-defined lower lobe; vertebral axis of caudal fin raised above body axis. Caudal peduncle not strongly depressed dorsoventrally or widely expanded laterally, with weak longitudinal keels Prionace, Galeocerdo or none, precaudal pits present and well-developed. Intestinal valve of scroll type.

Colour: brown, grey, yellowish or bluish above, white to cream or yellowish below, some species with prominent dark or light markings on fins; body usually without a prominent colour pattern (except for Galeocerdo).

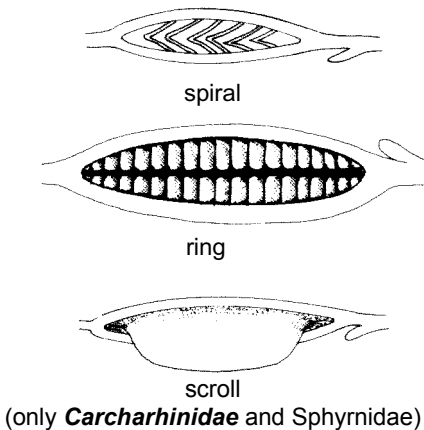
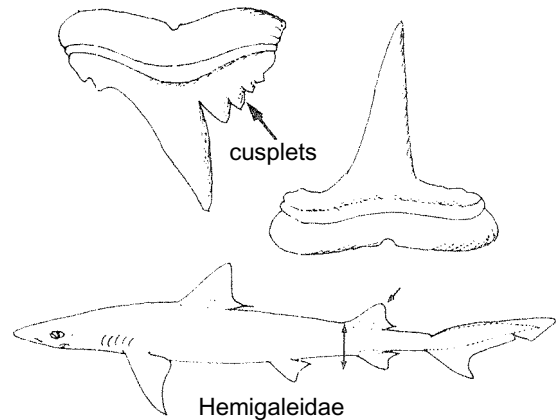
The Carcharhinidae are one of the largest families of sharks. All of the Western Indian Ocean representatives are strong swimmers, but the habits of a number of species, especially those that occur in the northeastern part of the area, are not well known. Small to very large species often occur close inshore, but most large ones are more abundant well offshore, but still near or over the continental or insular shelves. A few species, including the blue, silky and oceanic whitetip sharks, are truly oceanic. All are voracious predators, feeding heavily on bony fishes, other sharks, rays, squid, octopi, cuttlefishes, crabs, lobsters, and shrimp, but also sea birds, turtles, sea snakes, marine mammals, gastropods, bivalves, and carrion. The larger carcharhinids are dangerous to people, and they make up an important fraction of the shark species known to have attacked people. In the Western Indian Ocean, this is by far the most important shark family for fisheries, and various species figure prominently in catches within the area. Most are utilized for human food, but also for the preparation of various subproducts, including oil and Vitamin A from the liver, fishmeal, and fins for the oriental soupfin market. Separate statistics by species are not available and the total catch of carcharhinids reported to FAO from within the area exceeds 20 000 t/year (effective catch probably much higher).

**SIMILAR FAMILIES OCCURRING IN THE AREA:**

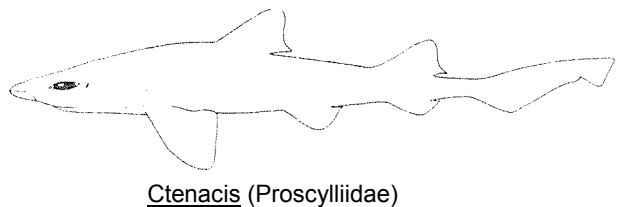
Hemigaleidae: intestinal valve of spiral type; also, no carcharhinids in the area combine the characters of long snout, spiracles, upper teeth with strong distal cusplets, long labial furrows, and second dorsal fin large, about 2/3 as large as first dorsal fin, with a very short inner margin, and with its origin anterior to that of the slightly smaller anal fin.

Proscylliidae and Triakidae: no precaudal pits, dorsal margin not undulated, intestinal valve of spiral type, eyes usually dorsolateral on head (except for Iago, Hypogaleus and Galeorhinus).

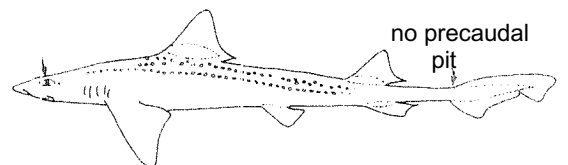
Other shark families: intestinal valve of spiral or ring type.



types of intestinal valve



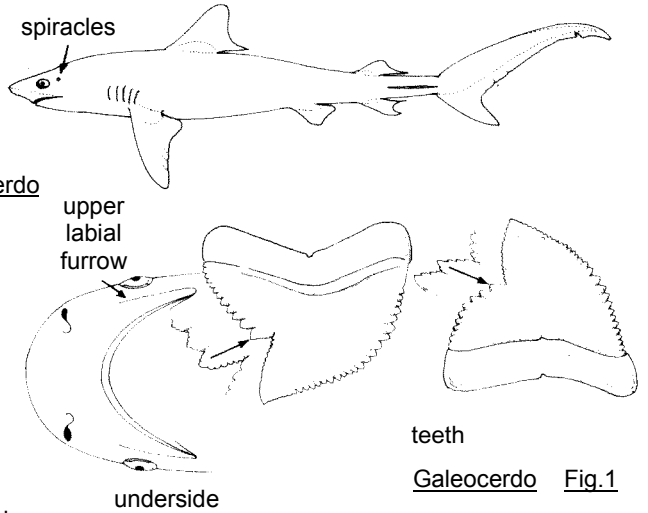
Ctenacis (Proscylliidae)



Mustelus (Triakidae)

**KEY TO GENERA OCCURRING IN THE AREA:**

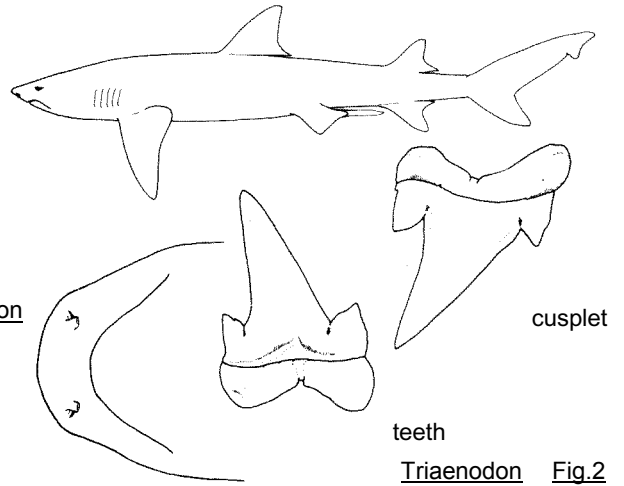
1a. Upper labial furrows very long, extending in front of eyes; spiracles present and relatively large; teeth in characteristic cockscomb shape; a prominent dermal keel on caudal peduncle (Fig.1); vertical black or dusky bars on back, obscure or absent in adults ..... Galeocerdo



Galeocerdo Fig.1

1b. Upper labial furrow long to very short, not extending in front of eyes; spiracles usually absent, small ones occasionally present (Loxodon, Negaprion, Triaenodon); teeth varied but not cockscomb-shaped; usually no dermal keel on caudal peduncle (Prionace has a low one); no vertical bars on back

2a. High cusplets on either side of primary cusps of upper and lower teeth; anterior and median nasal flaps forming a short tube (Fig.2) ..... Triaenodon



Triaenodon Fig.2

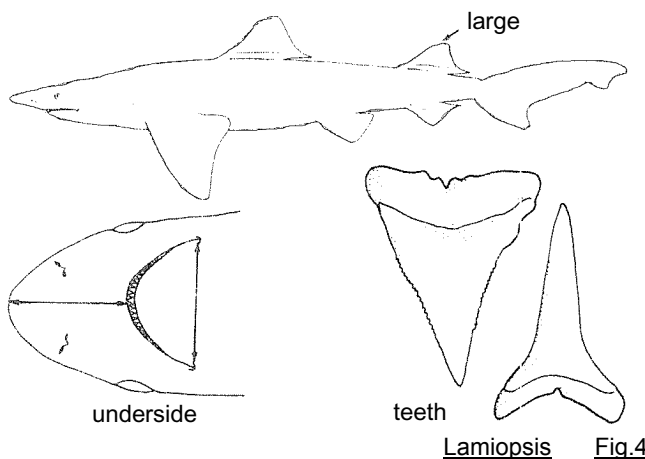
2b. Cusplets usually absent on lower teeth, low or absent on uppers; nasal flaps not forming a tube

3a. Second dorsal fin nearly or quite as large as first dorsal

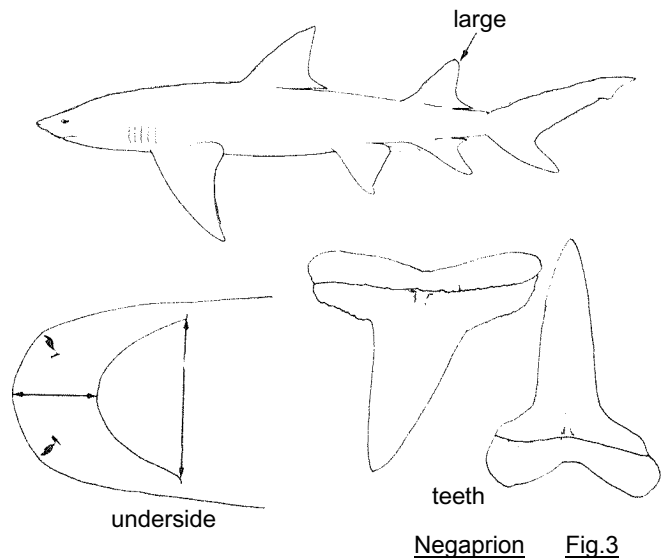
4a. Snout short, preoral length much less than mouth width; upper and lower teeth similar in shape, both with narrow, smooth-edged cusps (Fig.3)... Negaprion

4b. Snout longer, preoral length about equal to mouth width; upper and lower teeth very different, uppers with broadly triangular, serrated cusps, lowers with narrow, smooth cusps (Fig.4) ..... Lamiopsis

3b. Second dorsal fin considerably smaller than first dorsal

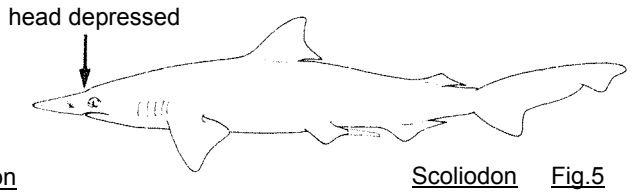


Lamiopsis Fig.4



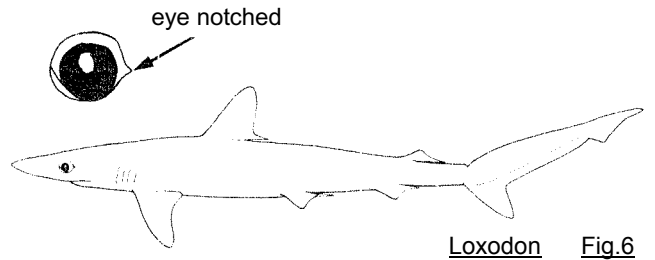
Negaprion Fig.3

- 5a. Head greatly depressed and trowel-shaped; pectoral fins broadly triangular and very long; their length from origins to free rear tips about equal to their anterior margins; free rear tip of first dorsal extending behind pelvic fin origins and usually about over their mid-bases; posterior margin of caudal fin not deeply incised (Fig.5) ..... Scoliodon



- 5b. Head moderately depressed to conical; pectoral fins narrower; their length 4/5 or less of anterior margins; free rear tip of first dorsal reaching at most to pelvic fin origins to (usually well anterior to them); posterior margin of caudal fin deeply incised

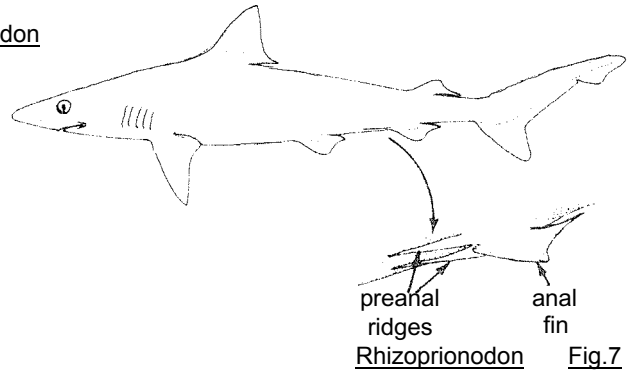
- 6a. Second dorsal fin origin well behind anal fin origin, usually over or slightly anterior to anal fin insertion; preanal ridges extremely long (Figs 6,7)



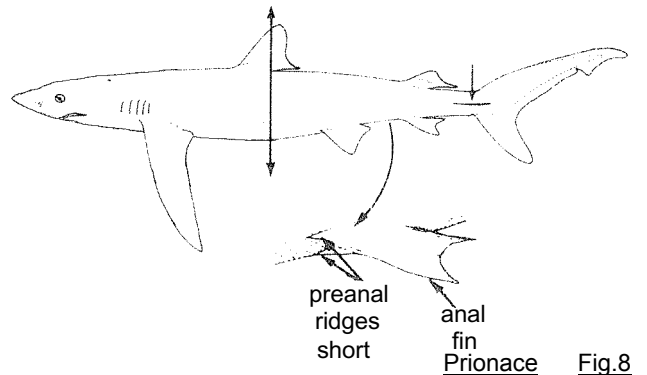
- 7a. Posterior notches present on eyes; first dorsal fin base contained 2 or 3 times in distance between pectoral and pelvic bases (Fig.6)..... Loxodon

- 7b. No eye notches; first dorsal fin base usually less than 2 times in distance between pectoral to pelvic fin bases, but up to 2 times in adult R. acutus (Fig.7)..... Rhizoprionodon

- 6b. Second dorsal fin origin usually slightly in front, above or behind anal fin origin, in front of anal midbase; preanal ridges short to absent (Figs 8,9,10)



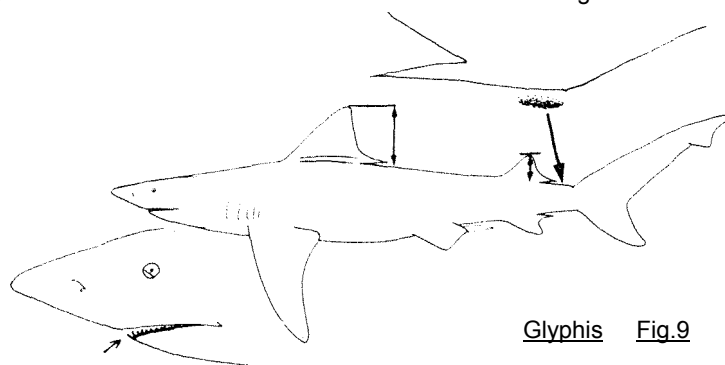
- 8a. Papilla-like gillrakers on gill arches; weak lateral keels on caudal peduncle; first dorsal fin base about 1.5 to 2 times farther from pectoral fin bases than from pelvic fin bases (Fig.8); colour brilliant dark blue above when alive .....Prionace





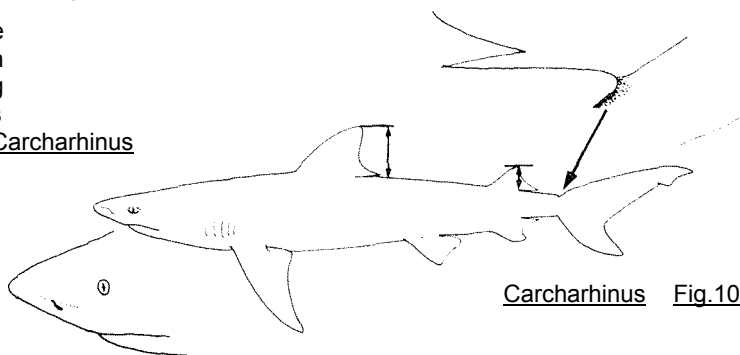
8b. No gillrakers or keels on caudal peduncle; first dorsal fin base equidistant between pectoral and pelvic fin bases or closer to pectoral fin bases (Figs 9,10); colour varied but not brilliant dark blue above when alive

9a. Second dorsal fin about half the height of first dorsal; lower teeth with very long, hooked cusps, prominently protruding when mouth is closed; precaudal pits in the form of horizontally oblong depressions, not transverse and crescentic (Fig.9) ..... Glyphis\*



Glyphis Fig.9

9b. Second dorsal fin less than half the height of first dorsal lower teeth with shorter, straight cusps, not protruding when mouth is, closed; precaudal pits transverse and crescentic (Fig.10) ..... Carcharhinus



Carcharhinus Fig.10

**LIST OF SPECIES KNOWN FROM THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

<u>Carcharhinus albimarginatus</u> (Rüppell, 1337)	CARCH	Carch 17
<u>Carcharhinus altimus</u> (Springer, 1950)	CARCH	Carch 2
<u>Carcharhinus amblyrhynchoides</u> (Whitley, 1934)	CARCH	Carch 18
<u>Carcharhinus amblyrhynchos</u> (Bleeker, 1356)	CARCH	Carch 19
** <u>Carcharhinus amboinensis</u> (Müller&Henle,1839)	CARCH	Carch 14
<u>Carcharhinus brachyurus</u> (Günther, 1870)	CARCH	Carch 15
<u>Carcharhinus brevipinna</u> (Müller & Henle, 1839)	CARCH	Carch 3
<u>Carcharhinus dussumieri</u> (Valenciennes, in Müller & Henle, 1839)	CARCH	Carch 20
<u>Carcharhinus falciformis</u> (Bibron, in Müller & Henle, 1839)	CARCH	Carch 4
<u>Carcharhinus galapagensis</u> (Snodgrass & Heller, 1905)	CARCH	Carch 16
<u>Carcharhinus hemiodon</u> (Valenciennes, in Müller & Henle, 18139)	CARCH	Carch 21
<u>Carcharhinus leucas</u> (Valenciennes, in Müller & Henle, 1839)	CARCH	Carch 6
<u>Carcharhinus limbatus</u> (Valenciennes, in Müller & Henle, 1839)	CARCH	Carch 7
<u>Carcharhinus longimanus</u> (Poey, 1861)	CARCH	Carch 8
<u>Carcharhinus macloti</u> (Müller & Henle, 1839)	CARCH	Carch 22
<u>Carcharhinus melanopterus</u> (Quoy & Gaimard, 1824)	CARCH	Carch 23
<u>Carcharhinus obscurus</u> (LeSueur, 1818)	CARCH	Carch 9
<u>Carcharhinus plumbeus</u> (Nardo, 1827)	CARCH	Carch 11
<u>Carcharhinus sealei</u> (Pietschmann, 1916)	CARCH	Carch 24
<u>Carcharhinus sorrah</u> (Valenciennes, in Müller & Henle, 1839)	CARCH	Carch 25
<u>Carcharhinus wheeleri</u> Garrick, 1982	CARCH	Carch 26

\* In a recent (1982) revision of the genus Carcharhinus, Prof. J.A.F. Garrick removed two species, Carcharias (Prionodon) gangeticus Müller & Henle, 1839 and Carcharias (Prionodon) glyphis Müller & Henle, 1839 from the genus, without further consideration of their placement. As these two species are rather distinct from Carcharhinus, and very similar to each other, they fall into a genus of their own, for which the name Glyphis Agassiz, 1843 is available (type species, C.(P.) glyphis by absolute tautonymy)

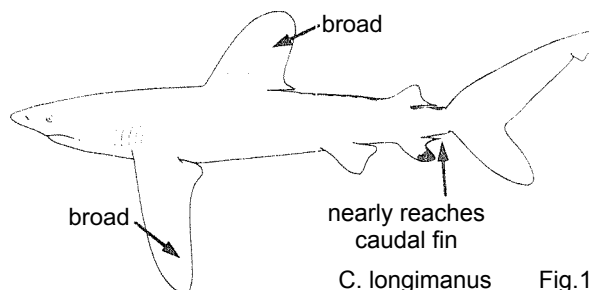
\*\*Triaenodon obtusus Day, 1878 from Karachi, Pakistan is usually recognized as a valid species, but examination of its holotype revealed that the species was based on a term fetus of Carcharhinus amboinensis

<u>Galeocerdo cuvieri</u> (Prion & LeSueur, in LeSueur, 1822)	CARCH Gol 1
* <u>Glyphis gangeticus</u> (Müller & Henle, 1839)	CARCH Glyp 1
<u>Lamiopsis temmincki</u> (Müller & Henle, 1839)	CARCH Lamio 1
<u>Loxodon macrorhinus</u> Müller & Henel, 1839	CARCH Lox 1
<u>Negaprion acutidens</u> (Rüppell, 1837)	CARCH Neg 2
<u>Prionace glauca</u> (Linnaeus, 1758)	CARCH Prion 1
<u>Rhizoprionodon acutus</u> (Rüppell, 1837)	CARCH Rhiz 3
<u>Rhizoprionodon oligoinx</u> Springer, 1964	CARCH Rhiz 4
<u>Scoliodon laticaudus</u> Müller & Henle, 1838	CARCH Scol 1
<u>Triaenodon obesus</u> (Rüppell, 1837)	CARCH Tria 1

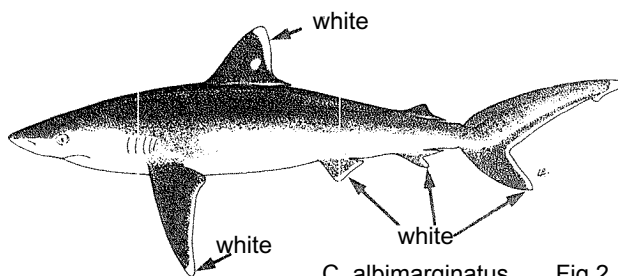
**KEY TO SPECIES OF THE GENUS Carcharhinus (GREY SHARKS) OCCURRING IN THE AREA:**

This is a large genus with approximately 30 species, of which 21 occur in the Western Indian Ocean; many of these are difficult to identify. The genus occurs worldwide in warm-temperate and tropical marine waters and also in warm rivers and lakes with connections to the sea. It is the dominant shark genus in the tropics, both in terms of variety and abundance. Many species are commercially important and make up a large percentage of the sharks taken in warmer waters. The distribution and general biology of most members of the genus in Fishing Area 51 (apart from those occurring in the extreme southwest of the area) is poorly known, and can be greatly elucidated by fisheries workers who become familiar with the species they encounter.

- 1a. Pectoral and first dorsal fins very broad distally and broadly rounded apically; free rear tip of anal fin nearly reaches lower caudal fin origin (Fig.1) .....C. longimanus
- 1b. Pectoral and first dorsal fins narrower distally and narrowly rounded to pointed apically; free rear tip of anal fin falling well in front of lower caudal fin origin
  - 2a. First dorsal, pectoral, pelvic and caudal fins with conspicuous white-tipped apices and white posterior margins (Fig.2) ..... C. albimarginatus
  - 2b. Fins without white-tipped apices and white posterior margins (except for white-tipped first dorsal fin in C. wheeleri)



C. longimanus Fig.1



C. albimarginatus Fig.2

\* This species is usually placed in the genus Carcharhinus, but, according to Prof. J.R.F. Garrick in his recent revision of the genus, C. gangeticus and the closely similar C. glyphis (Müller & Henle, 1839) fall outside the limits of Carcharhinus. If assigned to another genus, the proper name of this species is Glyphis gangeticus, as Glyphis Agassiz 1843 is the earliest available generic name

3a. Upper anterior teeth with broadly triangular cusps, not well delimited from bases (Figs 8, 9,10)

4a. Snout very short, its length about equal to, or less than the internasal space; no interdorsal ridge (Fig.3); bases of lower anteroiateral teeth strongly arched (Fig.4)

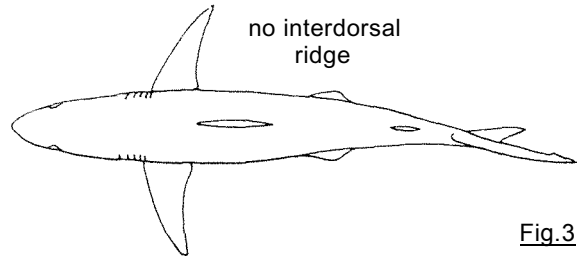


Fig.3

5a. First dorsal fin relatively higher (3.2 times or more) than second dorsal; second dorsal fin with a straight or nearly straight posterior margin (Fig.5) ..... C. amboinensis

5b. First dorsal fin relatively lower (less than 3.2 times) than second dorsal; second dorsal fin with a concave posterior margin (Fig.6) ..... C. leucas

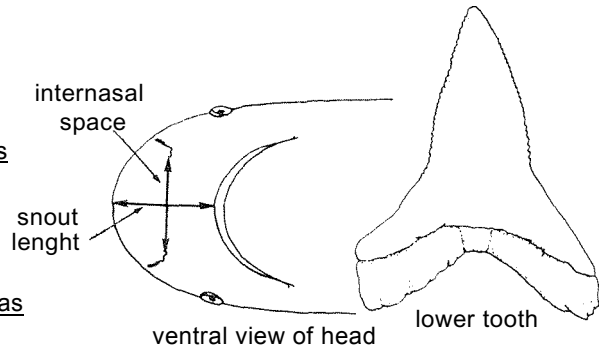
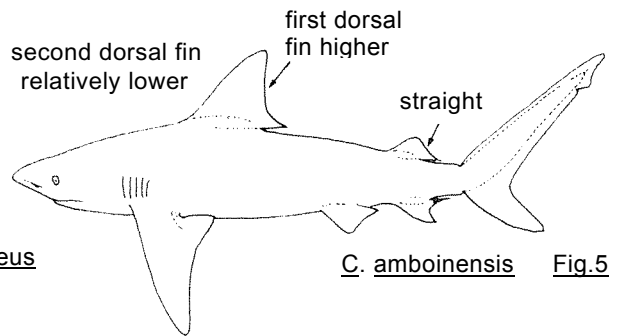


Fig.4

4b. Snout longer, its length greater than the internasal space; interdorsal ridge present (Fig.7); bases of lower antero-lateral teeth usually nearly straight

6a. Origin of first dorsal fin over or anterior to pectoral fin insertions; first dorsal fin very high, its height about half the distance from snout tip to its origin (Fig.9) ..... C. plumbeus



C. amboinensis Fig.5

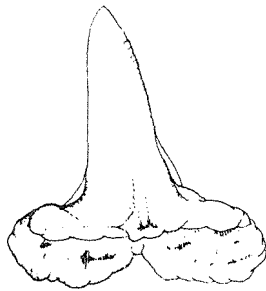
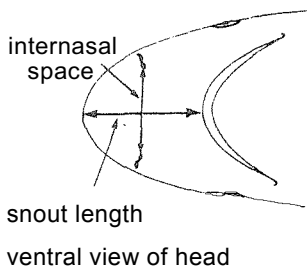
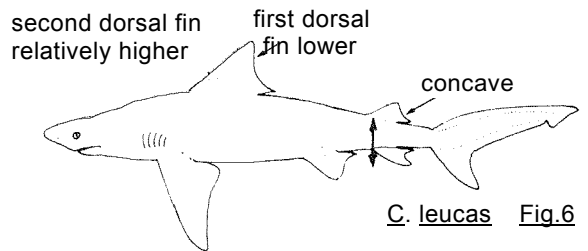
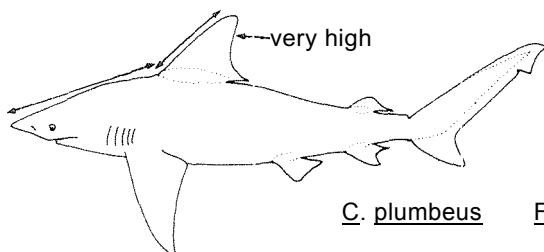


Fig.8



C. leucas Fig.6



C. plumbeus Fig.9

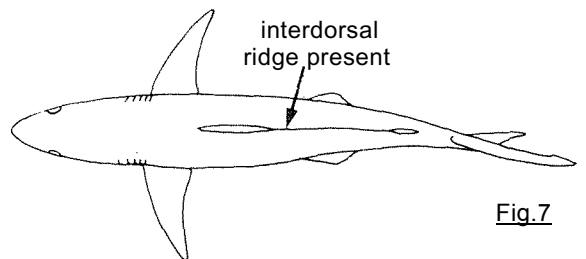
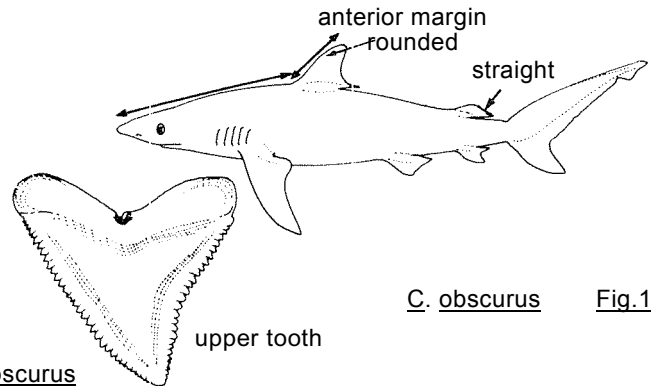


Fig.7

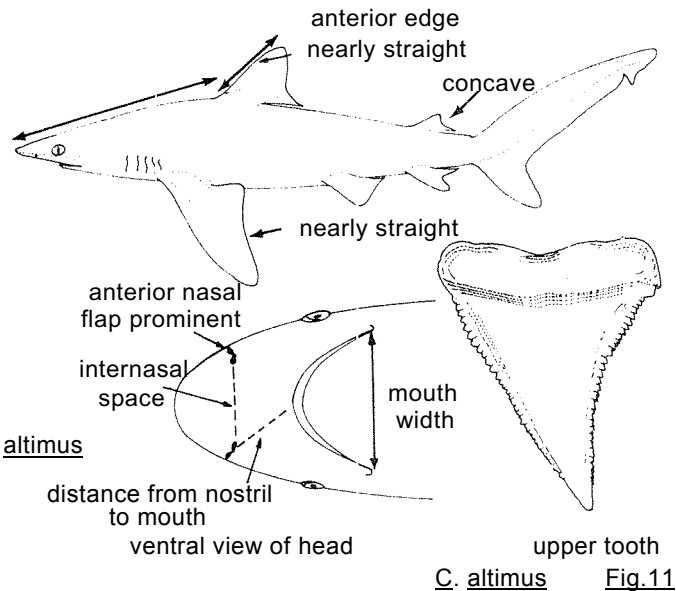
6b. Origin of first dorsal fin posterior to pectoral fin insertions; height of first dorsal considerably less than half of distance from snout tip to its origin (Figs 10,11,12)

7a. First dorsal fin lower, with a more rounded anterior margin; pectoral fins more falcate; second dorsal fin relatively low, with a nearly straight posterior margin; upper teeth relatively broader and lower (Fig.10) ..... C. obscurus



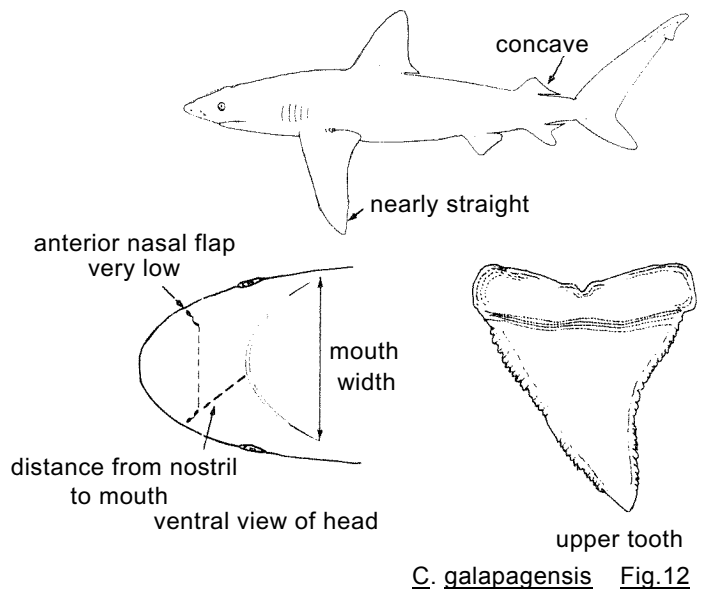
7b. First dorsal fin higher, with a nearly straight anterior margin; pectoral fins nearly straight, not very falcate; second dorsal fin relatively high with a more concave posterior margin; upper teeth relatively higher and narrower (Figs 11,12)

8a. Anterior nasal flaps usually very prominent; snout longer, distance from nostrils to mouth less than 2.4 times in mouth width (Fig.11); interdorsal ridge very prominent ... C. altimus



8b. Anterior nasal flaps rudimentary; snout shorter, distance from nostril to mouth more than 2.4 times in mouth width; interdorsal ridge less prominent (Fig.12) ..... C. galapagensis

3h. Upper anterior teeth with narrow to moderately broad cusps, well delimited from bases (Figs 13,14,21-25)



9a. Second dorsal fin with a conspicuous black tip but other fins without markings (Figs 13,14)

10a. First dorsal fin broadly triangular, not falcate; usually 13 or 14 tooth rows on either side of small medial or alternate teeth at symphysis; upper teeth with large serrated cusplets (Fig.13) ..... C. dussumieri

10b. First dorsal fin falcate; usually 12 tooth rows on either side of small medial or alternate teeth at symphysis; upper teeth with large, usually smooth-edged cusplets (Fig.14) ..... C. sealei

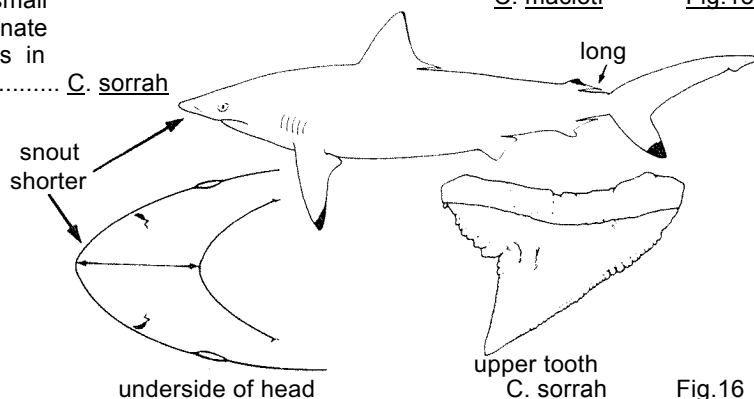
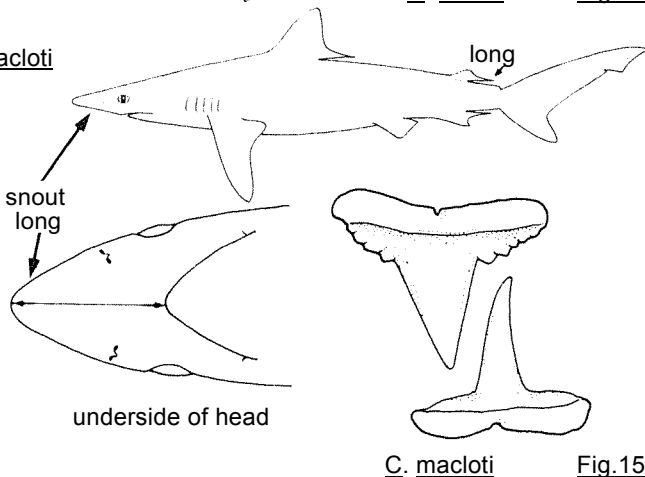
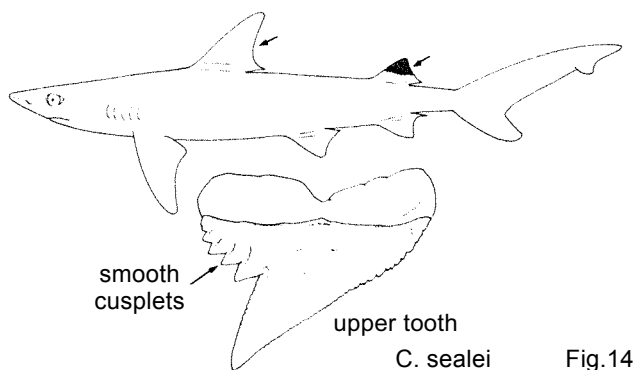
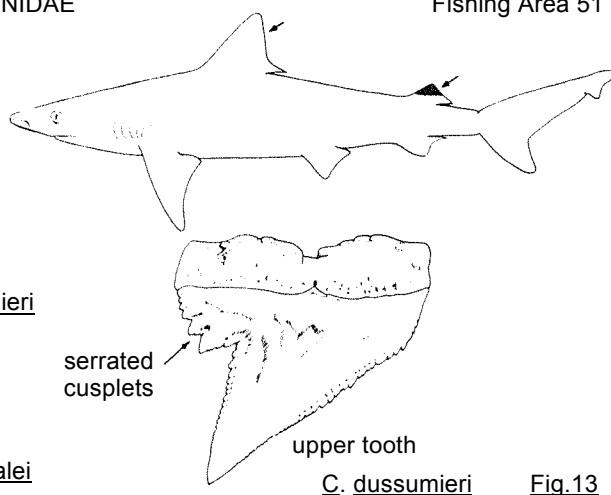
9b. Second dorsal fin either plain, dusky or black-tipped; other fins also with conspicuous dark markings if second dorsal is black-tipped

11a. Second dorsal fin very low, with greatly elongated inner margin usually 2 or 3 times the fin height (Figs 15,16,17)

12a. Snout very long and narrow (Fig.15); cusps of upper teeth smooth; bases of upper teeth with large cusplets; no interdorsal ridge ..... C. macloiti

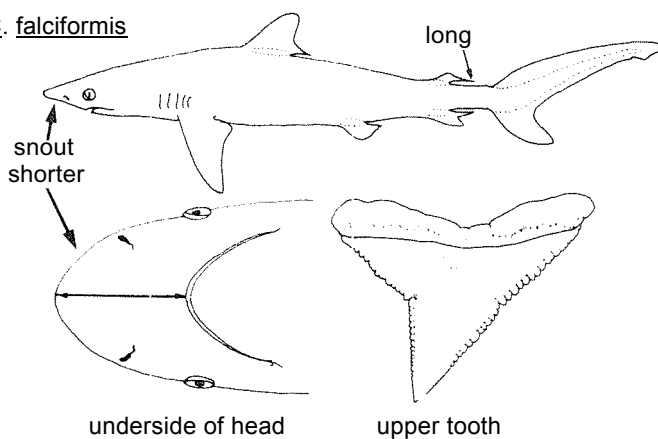
12b. Snout shorter and moderately broad; cusps of upper teeth serrated; mesial bases of upper teeth with small cusplets or none (Figs 16,17); interdorsal ridge present.

13a. Second dorsal, pectoral fin and ventral caudal lobe conspicuously black-tipped (Fig.16); 12 or 13 rows of teeth on either side of small medial or alternate teeth at symphysis in upper jaw..... C. sorrah



13b. Fins not black-tipped (Fig.17); 14 to 16 rows of teeth on either side of small medial or alternate teeth at symphysis in upper jaw .....

C. falciformis



C. falciformis

Fig.17

11b. Second dorsal fin low to moderately high, with inner margin short, less than 2 times the fin height (Figs 18-25)

14a. Caudal fin with a conspicuous broad black margin along its entire posterior edge; first dorsal fin either plain or white-tipped, but without black markings (Figs 18,19)

15a. Snout shorter; first dorsal fin with a conspicuous white tip (Fig.18) .....

C. wheeleri

15b. Snout longer; first dorsal fin without white tip (Fig.19) ....

C. amblyrhynchos

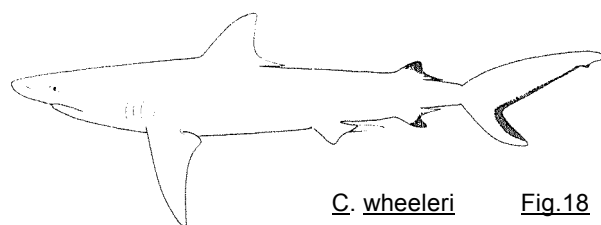
C. falciformis

Fig.17

14b. Caudal fin either without a broad black posterior margin, or if so marked, the first dorsal fin also has dark or black markings (Figs 20-22)

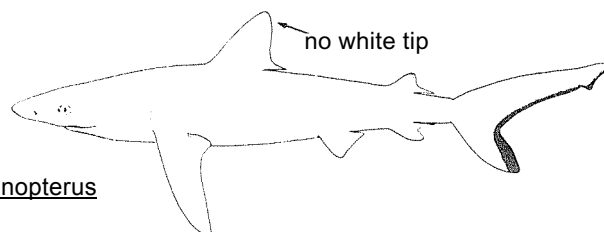
16a. Snout very short and bluntly rounded; first dorsal fin with a prominent black blotch; tips of other fins black or dusky (Fig.20); 11 to 13 rows of teeth on either side of small medial or alternate teeth at symphysis in upper jaw .....

C. melanopterus



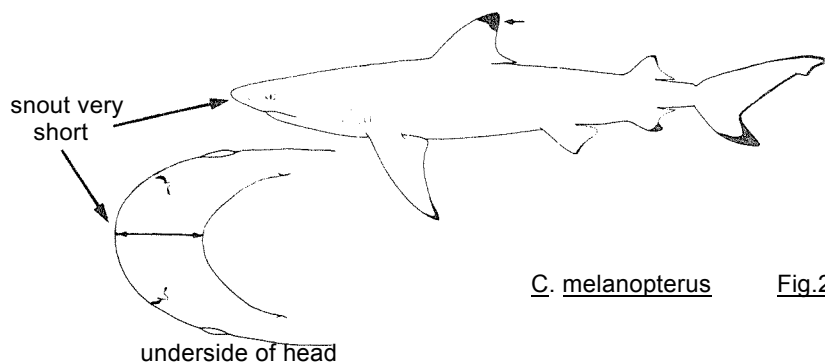
C. wheeleri

Fig.18



C. amblyrhynchos

Fig.19



C. melanopterus

Fig.20

16b. Snout longer and parabolic to pointed; first dorsal fin varying from plain to black-tipped; tips of other fins plain to black or dusky (Figs 21-25); 14 to 16 rows of teeth on either side of small medial or alternate teeth at symphysis in upper jaw

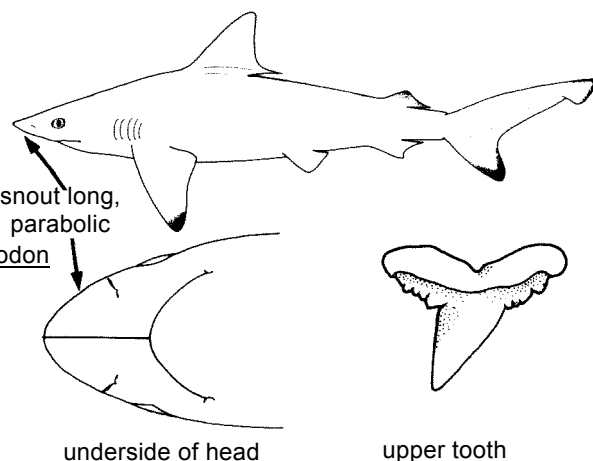
17a. Upper anteriolateral teeth with strong cusplets, cusps smooth-edged or weakly serrated; an interdorsal ridge present (Fig.21)..... C. hemiodon

17b. Upper anteriolateral teeth without strong cusplets, cusps usually strongly serrated (Figs 22-25); no interdorsal ridge (present in a minority of C. brachyurus individuals)

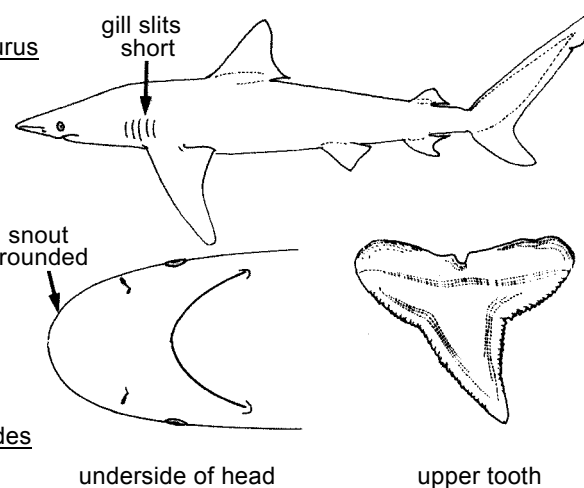
18a. Upper anterior teeth more asymmetrical, with flexed, oblique cusps; snout more rounded; gill slits shorter; fins plain (Fig.22) ..... C. brachyurus

18b. Upper anterior teeth symmetrical, with erect cusps; snout more pointed; gill slits longer (Figs 23-25); pectorals, second dorsal, ventral caudal fin lobe, and sometimes other fins usually black-tipped (dusky or plain in some C. amblyrhynchoides specimens and in young C. brevipinna)

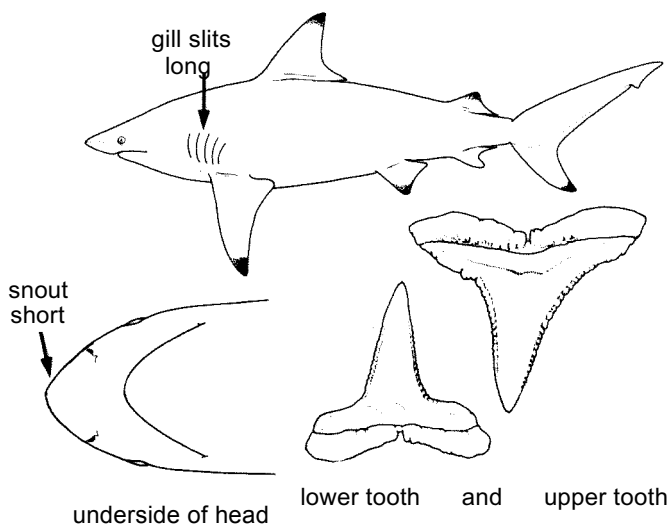
19a. Snout rather short, internasal distance 1 to 1.2 times in snout length (Fig.23) ..... C. amblyrhynchoides



C. hemiodon Fig.21



C. brachyurus Fig.22

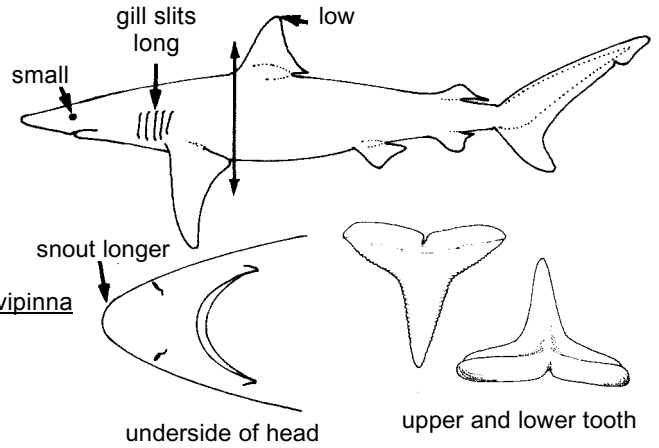


C. amblyrhynchoides Fig.23

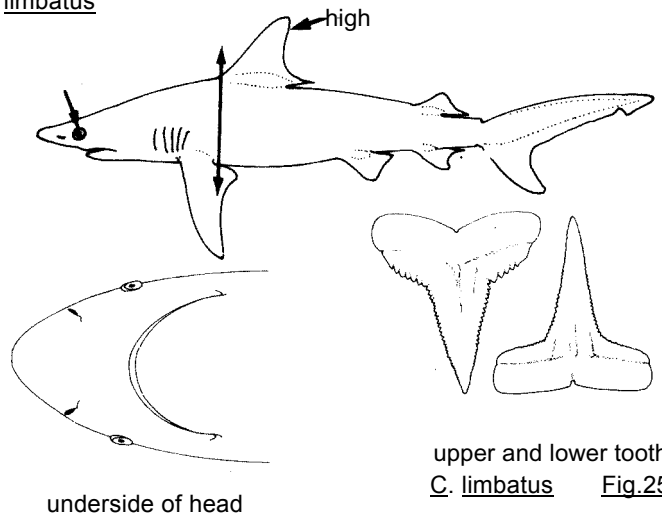
19b. Snout long, internasal distance 1.3 to 1.8 times in snout length (Figs 24,25)

20a. First dorsal fin lower, its height over 2.2 times in space between dorsal fin bases; first dorsal fin origin over or just behind free rear tips of pectoral fins; lower teeth with smooth or weakly serrated cusps (Fig.24) ..... C. brevipinna

20b. First dorsal fin higher, its height less than 2.2 times in space between dorsal fin bases; first dorsal origin over or just behind pectoral fin insertions; lower teeth with regularly serrated cusps (Fig.25)..... C. limbatus



C. brevipinna Fig.24

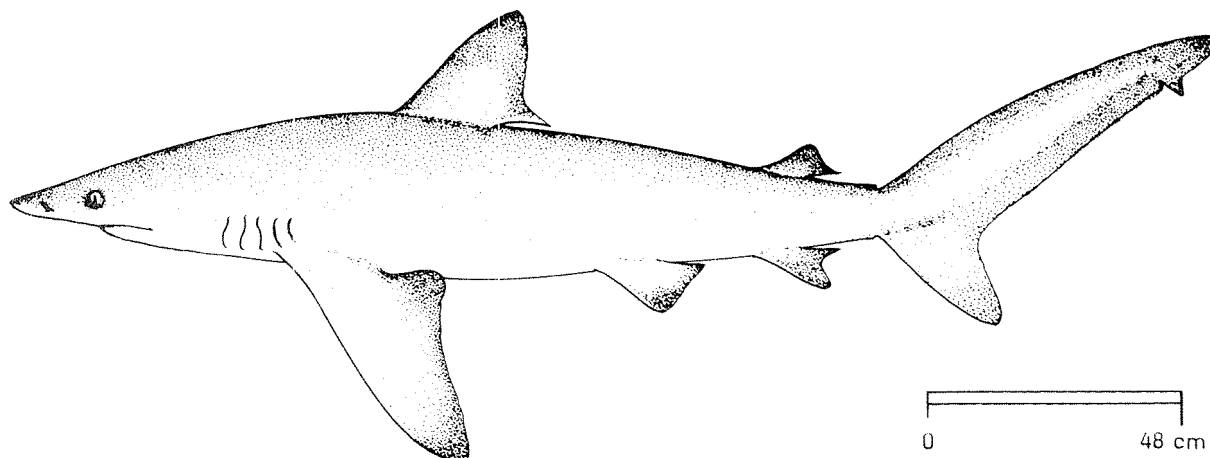


upper and lower tooth  
C. limbatus Fig.25



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus altimus (Springer, 1950)OTHER SCIENTIFIC NAMES STILL IN USE: Carcharhinus radamae Fourmanoir, 1961

## VERNACULAR NAMES:

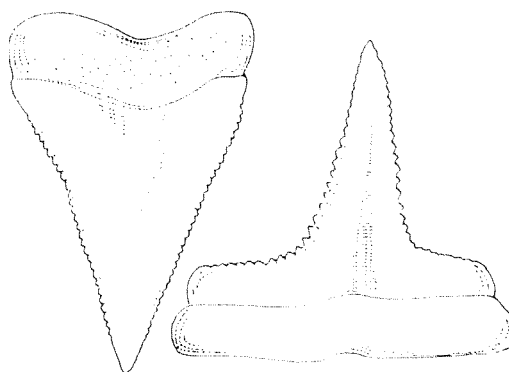
FAO :           En. - Bignose shark  
                   Fr - Requin babosse (= Réquiem babosse, Area 31)  
                   Sp - Tiburón baboso

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body slender. Snout rounded and rather long, its length about equal to, or greater than, mouth width, and greater than internasal space; labial furrows very short; anterior nasal flaps expanded as low, broadly triangular lobes; spiracles absent; teeth with serrated edges, upper teeth broadly triangular and erect in front of mouth, progressively oblique posteriorly; teeth in lower jaw erect and narrow-cusped. First dorsal fin moderately high with a narrowly rounded apex, its origin over inner margins of pectoral fins; origin of second dorsal fin about opposite anal fin origin; second dorsal in high, its inner margin less than 1.5 times the fin-height; pectoral fins long and not strongly falcate, broad-tipped but with angular apices. A high dermal ridge present between dorsal fins.

Colour: back greyish; belly whitish; inner corners of pectoral fins blackish.

upper tooth and lower tooth  
near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

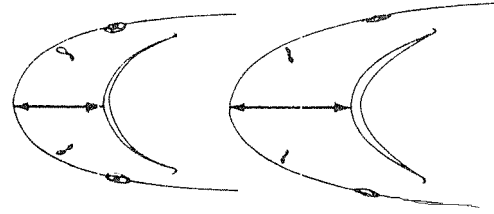
Carcharhinus plumbeus: snout shorter; first dorsal fin higher.

C. albimarginatus: snout shorter; anterior nasal flaps rudimentary; posterior margins and tips of fins white.

C. galapagensis: snout shorter, interdorsal ridge lower, anterior nasal flaps rudimentary.

C. obscurus: snout shorter, interdorsal ridge lower, teeth lower, first dorsal fin more convex in front, second dorsal fin lower and with a nearly straight posterior edge, pectoral fins more falcate.

Other species of Carcharhinus: separated from C. altimus by one or more of the following characters: no interdorsal ridge, narrow-cusped upper teeth, broad, rounded tips to pectoral and first dorsal fins; origin of first dorsal fin over or behind free rear tips of pectoral fins; second dorsal fin low, its inner margin about twice the fin height; anterior nasal flaps rudimentary.



C. plumbeus      C. altimus

head viewed from below

## SIZE:

Maximum: 300 cm; common to 240 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR :

Within the area, in the Red Sea, off South Africa, southeastern India and Madagascar, and probably elsewhere. Widespread in the Atlantic and Pacific Oceans.

Usually found in the edges of the continental shelves and uppermost slopes near the bottom, ranging from 30 to 430 m depth, but commonly between 80 and 220 m; rare in shallow waters. Viviparous, size at birth probably between 70 and 40 cm.

Feeds chiefly on fishes and cephalopods.

## PRESENT FISHING GROUNDS:

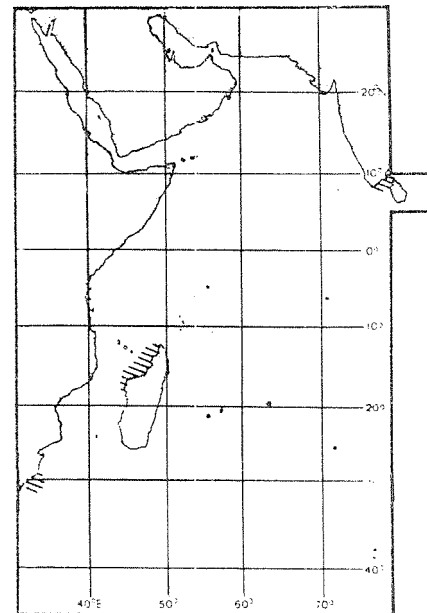
Red Sea and Madagascar (?), southeastern India.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught on longlines and with floating gillnets.

Utilized fresh for human consumption. Fins are used for oriental sharkfin trade.

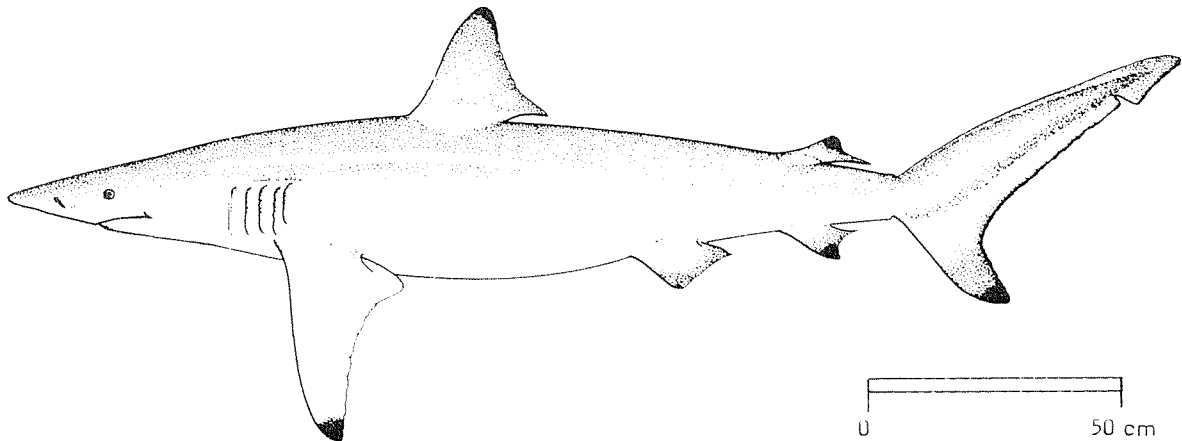


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus brevipinna (Müller & Henle, 1839)

## OTHER SCIENTIFIC NAMES STILL IN USE:

Aprionodon brevipinna (Müller & Henle, 1839)Carcharhinus johnsoni Smith, 1951

## VERNACULAR NAMES:

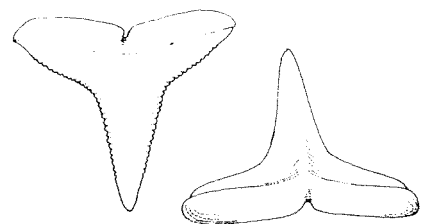
FAO : En. - Spinner shark  
Fr - Requin tisserand (= Réquiem tisserand, Area 31)  
Sp - Tiburón aleta negra

NATIONAL:

## DISTINCTIVE CHARACTERS:

A slender-bodied medium to large-sized shark. Snout pointed and long, its length equal to or greater than mouth width and greater than internasal space; labial folds short, but usually the upper pair longer and more prominent than in other Carcharhinus species from the area; anterior nasal flaps rudimentary, very low; upper and lower teeth nearly symmetrical and very similar, with mostly erect, very narrow cusps; uppers with entirely or partly serrated edges, lowers smooth; gill slits relatively long. First dorsal fin with a narrowly rounded apex, its origin above or slightly behind free rear tips of pectoral fins; second dorsal fin high, its inner margin less than twice the height of fin, its origin about: over that of anal fin; pectoral fins falcate: and with pointed tips. No dermal ridge between dorsal fins.

Colour: grey on back, white below, with a conspicuous white band on sides. Second dorsal, anal, undersides of pectorals and lower caudal fin lobe black or dark grey-tipped in subadults and adults, but. unmarked or nearly so in small individuals (below 1 m).

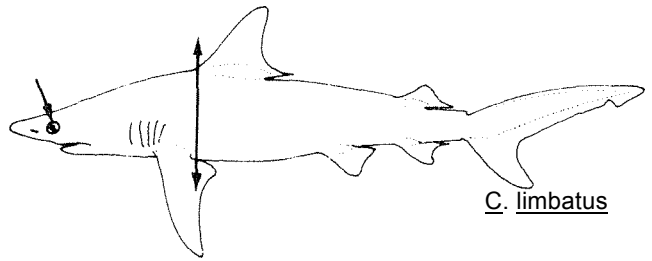


upper tooth and lower tooth  
near centre

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Carcharhinus limbatus and C. amblyrhynchoides: body stouter, eyes larger, first dorsal fin larger and more anterior, its origin over pectoral fin insertions or just behind them. C. amblyrhynchoides also with a shorter snout.

Other Carcharhinus species: differently shaped teeth (more oblique or broadly triangular), shorter gill slits, shorter upper labial furrows.



**SIZE:**

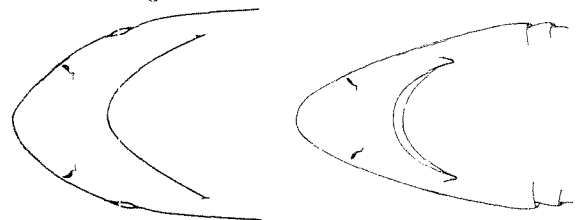
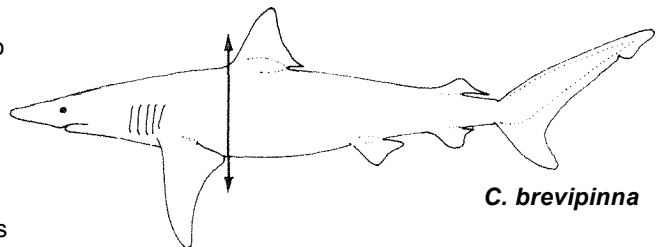
Maximum: 280 cm (mature adults); common to 250 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Widespread in the area, but with some gaps in its range probably due to confusion with other species; known from South Africa, southern Mozambique, the Mauritius-Seychelles area, Madagascar, Europa Island, Red Sea, Oman and Muscat, the "Gulf", and southern India. A wide-ranging, nearly circumtropical species also found in the Western and Eastern Atlantic and the Mediterranean, the Eastern Indian Ocean and Western Pacific, but apparently absent from the Eastern Pacific.

An active, fast-swimming shark, often making vertical spinning leaps out of the water, as a feeding technique in which the shark spins through a school of small fish with open mouth and then breaks the surface. Viviparous, number of embryos about 6 to 15. Size at birth about 60 to 75 cm.

Feeds mostly on small schooling fishes, also squid, small sharks and rays.



C. amblyrhynchoides

C. brevipinna

underside of head

**PRESENT FISHING GROUNDS:**

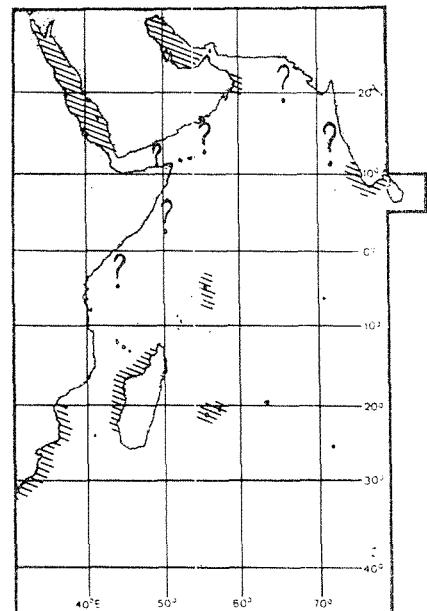
Offshore waters, probably also inshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with drifting gillnets and longlines.

Utilized fresh for human consumption (India); fins probably used in the oriental sharkfin trade, and livers for vitamin oil production.

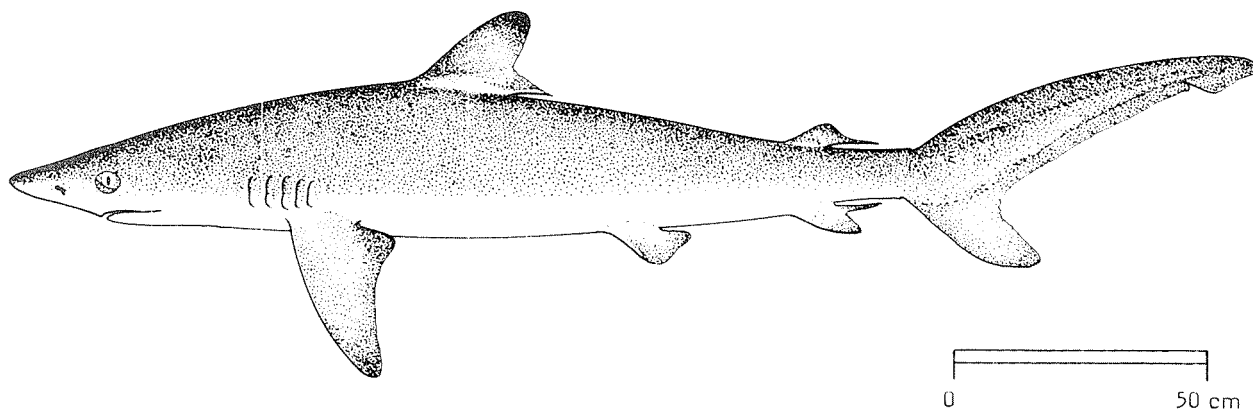


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus falciformis (Bibron, in Müller & Henle, 1839)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

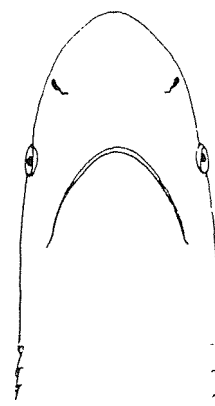
FAO : En - Silky shark  
Fr - Requin soyeux (= Réquiem soie, Area 31)  
Sp - Tiburón jaquetón

NATIONAL:

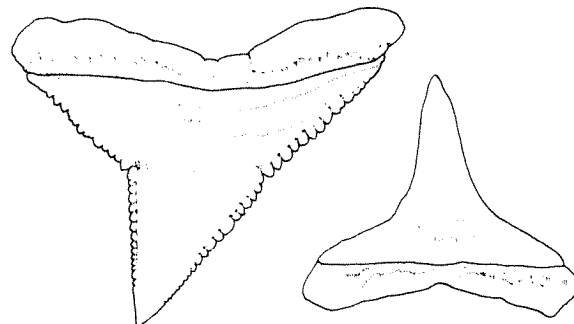
## DISTINCTIVE CHARACTERS:

A large shark, with an elongate and slender body. Snout narrowly rounded, moderately long, equal to or slightly shorter than mouth width, but longer than internasal space; labial folds very short; anterior nasal flaps low, rudimentary; spiracles absent; upper teeth with relatively narrow cusps well delimited from the heavy, serrated bases, their outer edges notched; teeth in lower jaw erect, their edges only slightly serrated. First dorsal fin moderately high, its apex rounded, its origin behind the free rear tips of pectoral fins; second dorsal fin very low, its posterior lobe noticeably long and slender, its inner margin twice the height of fin; origin of second dorsal fin about over that of anal fin; pectoral fins long and falcate, more so in adults than in young; a dermal ridge present between the dorsal fins.

Colour: back dark grey, greyish brown or bluish black (in life); belly greyish or white.



underside of head

upper tooth and lower tooth  
near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Possibly confused with other species, under the names *Carcharirus brachyurus* and *C. gangeticus*, neither of which are truly oceanic species.

The combination of characters such as the long and slender body, the distinctive teeth, the long and falcate pectoral fins, the position of first dorsal fin origin behind the free rear tips of pectoral fins, the presence of a mid-dorsal ridge and the very low second dorsal fin with a conspicuously long posterior lobe, and the absence of conspicuous markings, readily distinguish this species from other carcharhinid sharks occurring in the area.

## SIZE:

Maximum: 350 cm; common to 250 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Probably wide-ranging in the area, but present records are spotty, partly because of confusion with other species. In the area, off southern Mozambique and possibly South Africa, western Madagascar, the Comores, Zanzibar, the Red Sea, and off Ceylon. Elsewhere, circumtropical in the Western, Central and Eastern Pacific and throughout the Atlantic.

Inhabits oceanic waters near and beyond the continental slopes, but also found in coastal waters. Lives usually near the surface, but occurs sometimes at considerable depths (to 500 m). Viviparous, number of young 2 to 14 per litter; size at birth 57 to 87 cm.

Feeds chiefly on fishes, including tunas, squids and pelagic octopods. Very quick in its movements, it often causes damage to the catch and gear in tuna fisheries. Reported to be dangerous to humans.

## PRESENT FISHING GROUNDS:

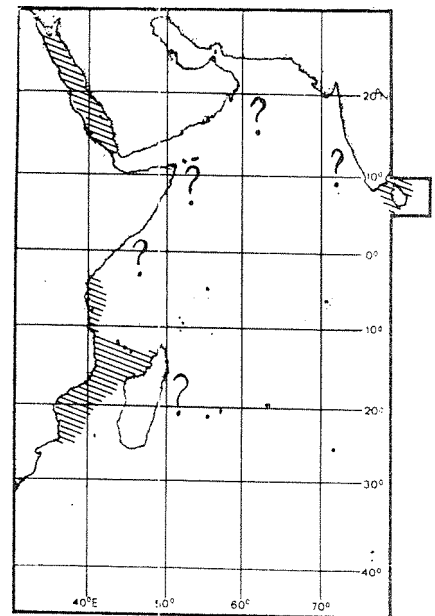
Caught mainly well offshore, far from land and near the continental slopes.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mainly with floating longlines.

Utilization uncertain in the area, perhaps mostly discarded or utilized for fishmeal, as it is currently considered less valuable than other pelagic fishes taken on longlines.



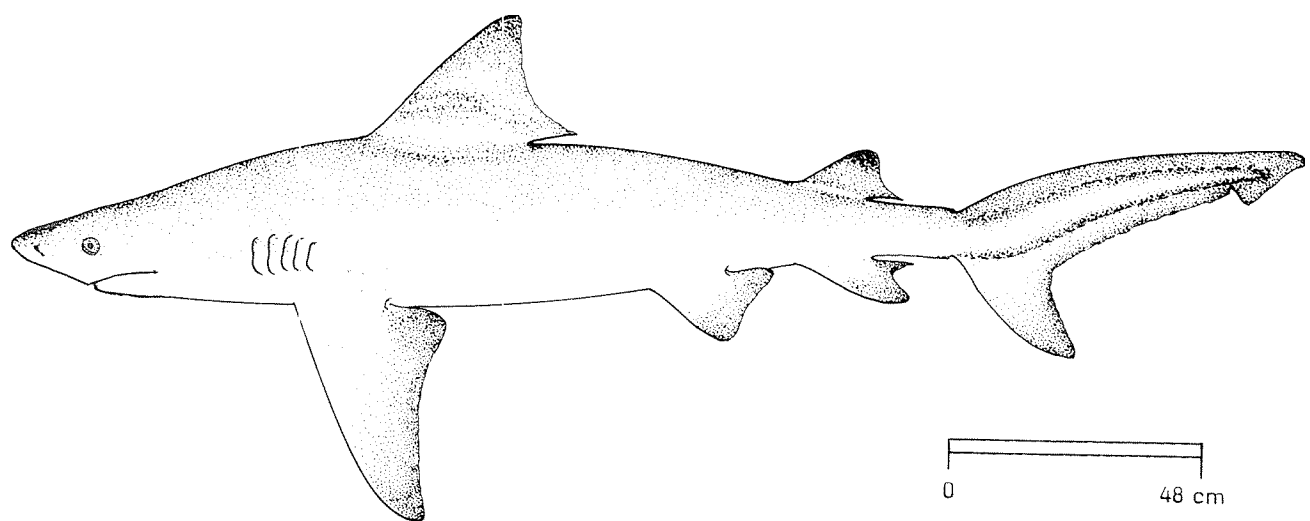
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

Carcharhinus leucas (Valenciennes, in Müller & Henle, 1839)

OTHER SCIENTIFIC NAMES STILL IN USE: Carcharhinus zambezensis (Peters, 1852)  
Carcharhinus vanrooyeni Smith, 1958



VERNACULAR NAMES:

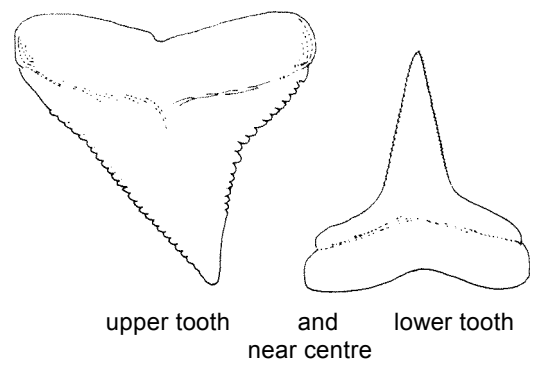
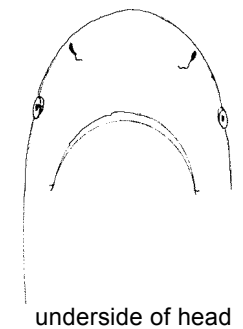
- FAO : En - Bull shark  
Fr - Requin bouledogue (= Réquiem taureau, Area 31)  
Sp - Tiburón sarda (= Lamia)

NATIONAL:

DISTINCTIVE CHARACTERS:

A large, stout shark. Snout very broadly rounded and extremely short, its length less than distance between nostrils, and much less than mouth width; labial folds very short; spiracles absent; nostrils with a low, broadly triangular anterior nasal flap; teeth in upper jaw triangular, with broad, heavy, serrated cusps, their outer edges nearly straight in anterior teeth, but becoming increasingly concave to the sides; lower teeth with erect to slightly oblique, heavy cusps with serrated edges and strongly arched bases. First dorsal fin high and broad with a pointed or slightly rounded apex, its origin a little in advance of insertion of pectoral fins; second dorsal fin high with a short posterior lobe, its inner margin less than the fin height, and its origin slightly in front of that of anal fin; pectoral fins broad, with narrow pointed tips. No dermal ridge between dorsal fins.

Colour: back greyish, belly white; tips of fins dark, especially in young individuals.

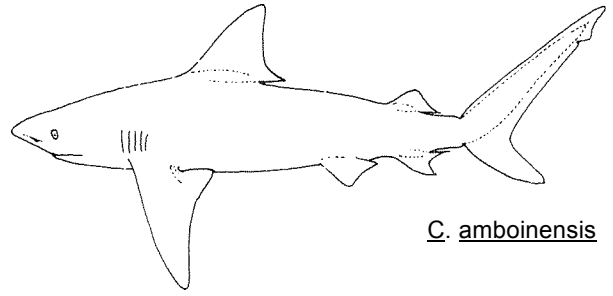


## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

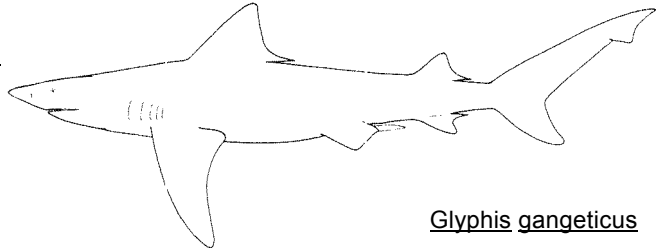
Carcharhinus amboinensis: very similar to C. leucas, but differs in having a higher first dorsal fin and a lower second dorsal (first dorsal at least 3.2 times higher than second dorsal) and fewer vertebral centra (89 to 95 against 109 to 120 in C. leucas).

Glyphis gangeticus: C. leucas has often been mistaken for this species, which also enters freshwater. G. gangeticus differs in having smaller eyes, a more parabolic, narrow snout, higher and narrower upper and lower teeth, and lowers with long, smooth-edged, prominently hooked cusps that protrude when the mouth is closed (cusps of lower teeth virtually hidden when mouth is closed in C. leucas), a slightly higher second dorsal fin about half the height of the first, possibly more falcate pectoral fins, and precaudal pit in the form of a narrow, longitudinal pit (transverse and crescentic in all Carcharhinus in the area, including C. leucas).

Other species of Carcharhinus in the area with broad, triangular upper teeth: first dorsal fin and pectoral fins with broadly rounded tips (C. longimanus); snout longer, bases of lower teeth usually not arched, and interdorsal ridge present (C. plumbeus, C. obscurus, C. altimus, C. galapagensis and C. albimarginatus).



C. amboinensis



Glyphis gangeticus

### SIZE:

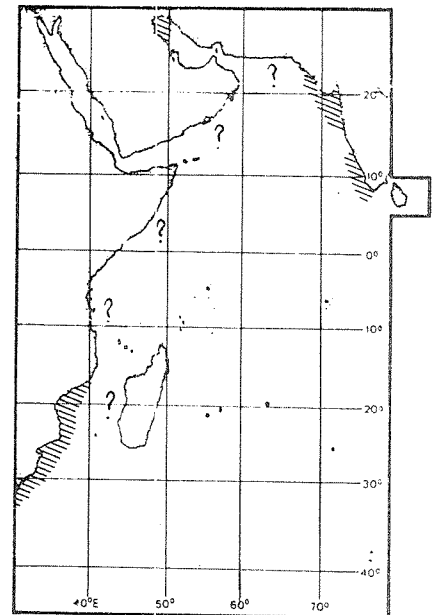
Maximum: 350 cm; common to 260 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, from South Africa northward to Somalia, including the Zambezi, Shire, Reunwa, Sabi and Limpopo Rivers, the Tigris and Shatt-el-Arab Rivers in Iraq (and presumably the "Gulf", into which these rivers drain), and northwestern and southwestern India (Bombay and Cochin); probably more wideranging, but confusion with Glyphis gangeticus may mask some additional records of this species from the area. Elsewhere, virtually circumtropical in warm continental waters as well as numerous river systems, in the Atlantic, Indo-Pacific and Eastern Pacific. Apparently absent from the Mediterranean Sea, and not occurring off oceanic islands far from continental landmasses.

Predominantly a coastal species inhabiting shallow waters, especially in bays and river estuaries. It tolerates a wide range of salinities, readily penetrates far up rivers and also into hypersaline bays. Usually sluggish in its movements, this bottom-living shark may develop great speed when chasing its prey. Viviparous, number of embryos up to 12, size at birth to 60 cm. The young are more abundant in brackish waters.

Feeds on fishes, including mackerels and tunas, smaller sharks, rays, invertebrates (crabs, shrimps, sea urchins, etc.) and carrion. It has large jaws and teeth for its size, making it capable of taking relatively large prey. Known to be dangerous to people, and possibly one of the most dangerous sharks because of its habitat, large size, powerful feeding structures and omnivorous habits.



### PRESENT FISHING GROUNDS:

Coastal waters (estuaries, bays, straits between islands) probably throughout its range, but more rarely taken offshore.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mainly with longlines and gillnets.

This species is utilized fresh for human consumption, and probably its fins figure in the oriental sharkfin trade; its liver is processed for vitamin oil.

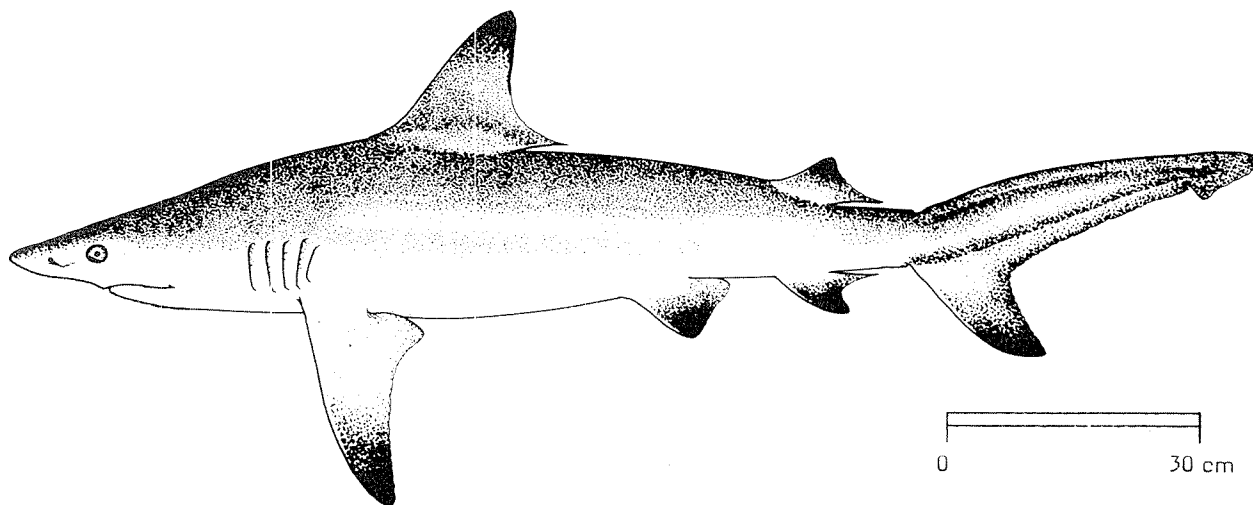


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus limbatus (Valenciennes, in Müller & Henle, 1839)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

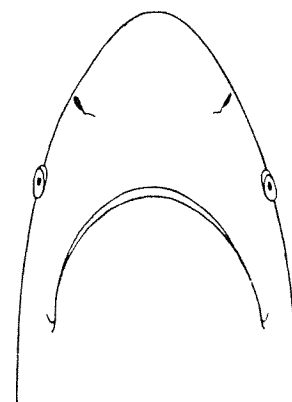
FAO :           En - Blacktip shark  
                   Fr - Requin bordé (= Réquiem macuire, Area 31)  
                   Sp - Tiburón macuira

NATIONAL:

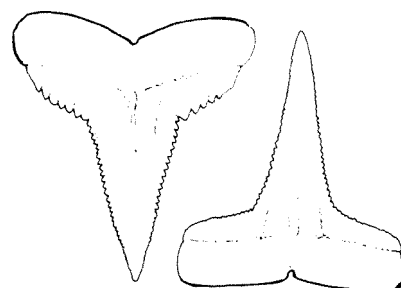
## DISTINCTIVE CHARACTERS:

Body fusiform, moderately slender. Snout long, about equal to, or slightly less, than mouth width, greater than distance between nostrils, its tip narrowly rounded to pointed; labial folds short; spiracles absent; upper and lower teeth nearly symmetrical and similar, with erect, narrow cusps and serrated edges; gill slits moderately long, First dorsal fin with a pointed or very narrowly rounded apex, its origin above, or slightly posterior to insertion of pectoral fins; second dorsal fin high, its inner margin less than twice the height of fin, and its origin over or slightly in front of that of anal fin; pectoral fins falcate. No dermal ridge between dorsal fins.

Colour: back dark grey, ashy blue or dusky bronze; belly white or yellowish white. A dark band extending rearward along each side to about over origin of pelvic fin; tips of pelvic fins with a persistent black spot; tips of dorsals, anal, pectorals and the lower lobe of caudal fin usually black or dusky in young individuals, but these markings fade with growth.



underside of head

upper tooth           and           lower tooth  
near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus brevipinna: body slimmer, origin of first dorsal fin usually a little posterior to free rear tips of pectoral fins; teeth in lower jaw with smooth edges; upper labial folds longer than in other Carcharhinus species; eyes smaller, snout larger.

C. amblyrhynchoides: very similar to this species, except for its conspicuously shorter, wedge-shaped snout.

The combination of characters such as the moderately pointed long snout, the narrow and erect-cusped, serrated teeth, the absence of a mid-dorsal ridge, the high first dorsal fin, the presence of a persistent black spot on tips of pelvic fins and a dark band on sides readily distinguishes C. limbatus from other carcharhinid sharks occurring in the area.

### SIZE:

Maximum: 247 cm; common to 150 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, off South Africa, Madagascar and southern Mozambique, the Seychelles and other island groups, the Red Sea, Pakistan and India, but probably very wide ranging in the area, more so than scattered records suggest. A wide-ranging, circumtropical and subtropical species found in the Western and Eastern Atlantic, including around some oceanic islands, in the Mediterranean Sea, the Indo-Pacific from South Africa and the Red Sea to Hawaii, Tahiti and the Eastern Pacific.

Inhabits coastal as well as offshore surface waters. A fast-moving shark that sometimes leaps out of the water. Occasionally enters brackish waters, but without a tolerance for fresh water. Viviparous, number of embryos ranging from 1 to 10, size at birth about 60 cm.

Feeds mainly on small schooling fishes; also on rays and squids. Apparently minimally dangerous to people, but can be aggressive when divers are spearing fish.

### PRESENT FISHING GROUNDS:

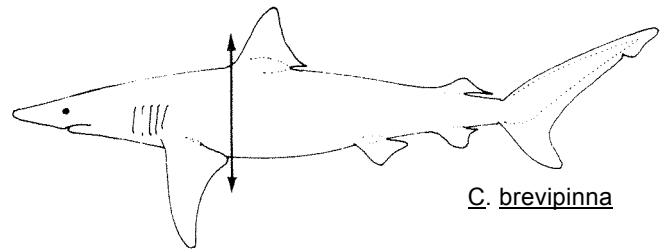
Inshore, as well as offshore waters. Taken off India and Pakistan, and probably elsewhere in the area. Very commonly caught in the area.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :

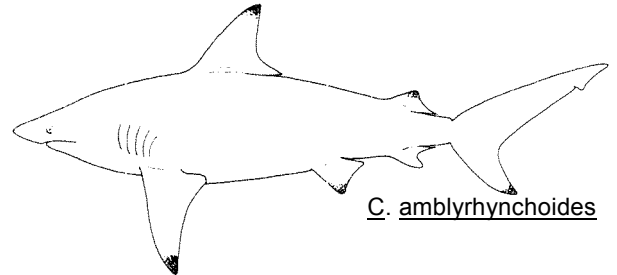
Separate statistics are not reported for this species.

Caught with floating longlines, floating gillnets, and probably other gear.

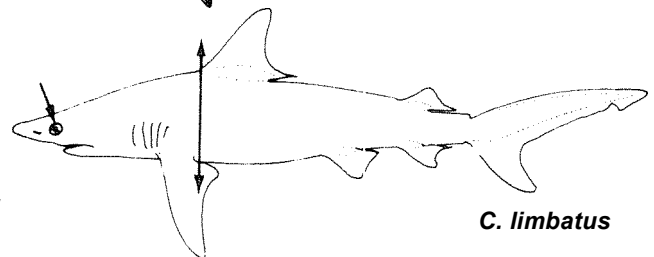
Marketed fresh for human consumption, with fins figuring in the oriental sharkfin market; oil valuable for Vitamin A.



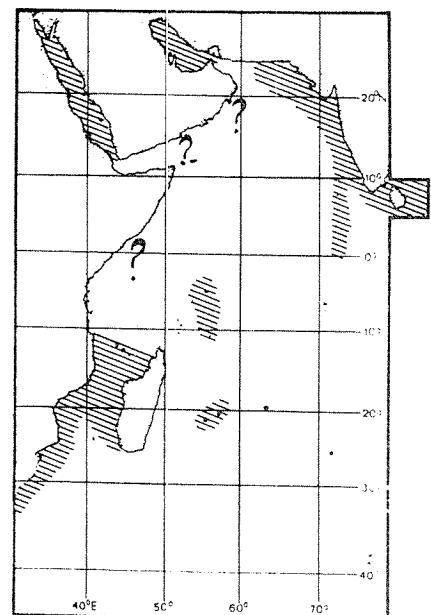
C. brevipinna



C. amblyrhynchoides



C. limbatus

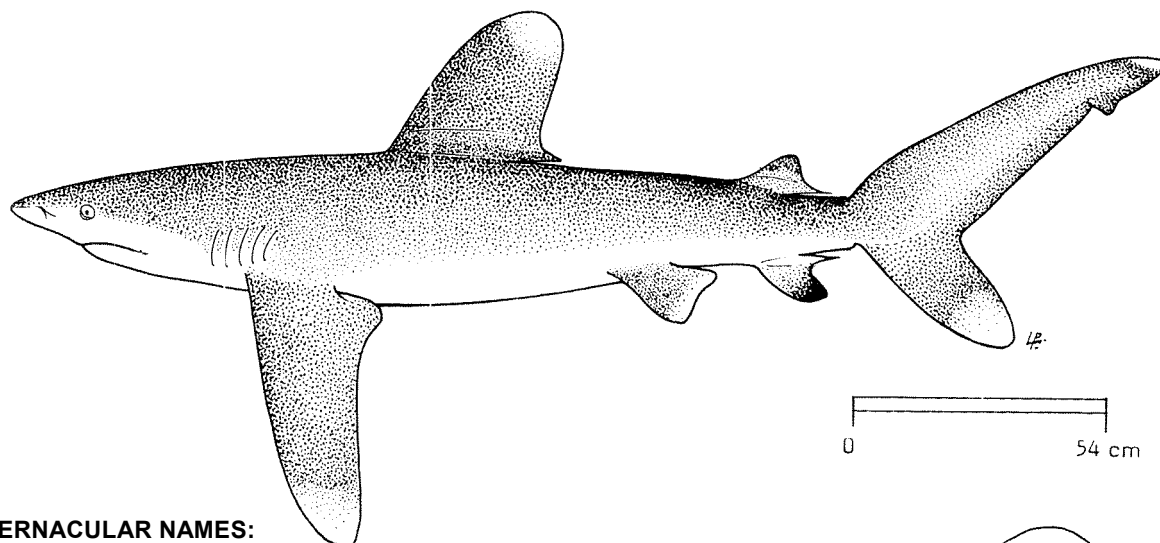


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus longimanus (Poey, 1861)

## OTHER SCIENTIFIC NAMES STILL IN USE:

Carcharhinus maou (Lesson, 1830)\*  
Pterolamiops magnipinnis Smith, 1958  
Pterolamiops budkeri Fourmanoir, 1961

## VERNACULAR NAMES:

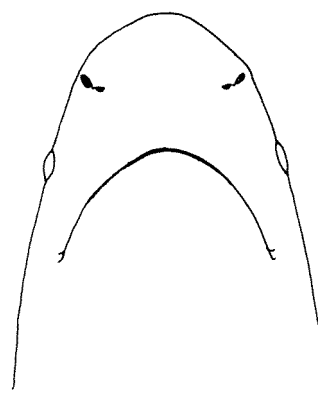
FAO : En - Oceanic whitetip shark  
Fr - Requin océanique (= Réquiem océanique, Area 31)  
Sp - Tiburón oceánico (= Lamia)

NATIONAL :

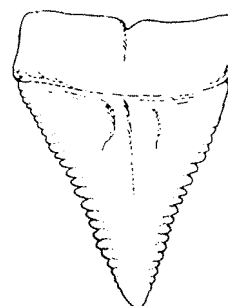
## DISTINCTIVE CHARACTERS:

A large, moderately stout shark. Snout short and broadly rounded, its length equal to, or somewhat less than, mouth width, and greater than distance between nostrils; labial folds very short; anterior nasal flaps very low, rudimentary; spiracles absent; teeth with serrated edges, those in upper jaw triangular with broad, heavy, mostly erect, cusps nearly symmetrical anteriorly, but becoming increasingly oblique at sides; teeth in lower jaw with erect, heavy cusps and serrated edges. First dorsal fin noticeably large, with a very broadly rounded apex, its origin slightly behind insertion of pectoral fins; second dorsal fin high, its inner margin less than twice the fin height, its origin over, or slightly in front of that of anal; pectoral fins very long (as long as, or even longer than, head) with broadly rounded, wide tips; rear tip of anal fin extending nearly to origin of caudal fin. A dermal ridge present between dorsal fins.

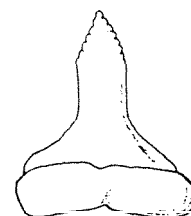
Colour: back usually dark grey with a bronze tinge, but sometimes brown or bluish; belly whitish, sometimes with a yellow tinge. Tips of first dorsal fin, pectoral fins and lower lobe of caudal fin often white or with white spots (sometimes absent); ventral surface of pelvic fins, apices of anal and second dorsal fins, and ventral lobe of caudal fin often with black spots; also black or dusky saddle - marks in front of second dorsal fin, upper margin of caudal fin and between dorsal fins (especially in young).



underside of head



upper tooth



and lower tooth

near centre

\*Incorrect name used in W.C. Atlantic set of Species Identification Sheets

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

The combination of characters such as the characteristic shape of the dorsal and pectoral fins, the remarkable length of the latter, the short, broadly rounded snout, the long rear tip of the anal fin and the white spots on tips of fins readily distinguishes this species from other carcha-hinids occurring in the area.

## SIZE:

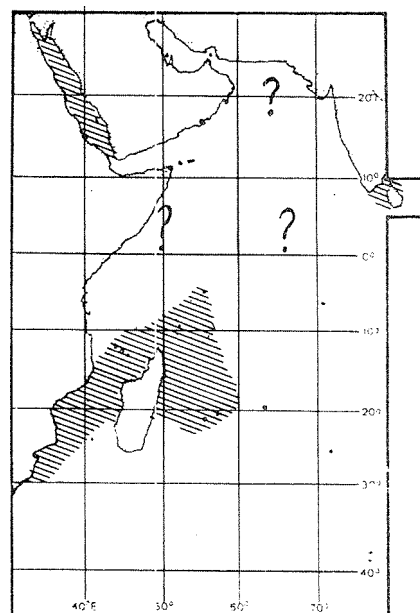
Maximum: 350 cm; most adults reach 270 cm or less.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, from the Mozambique Channel area, including South Africa, Madagascar, Mozambique and the Comoro Islands, also the Mauritius-Seychelles area, the Red Sea, southeastern India and Ceylon; but probably more widely distributed, particularly in oceanic basins. Elsewhere, circumtropical in the Atlantic, Pacific, and probably the eastern Indian Ocean; possibly also in Mediterranean Sea but this is uncertain.

Along with the silky shark (*Carcharhinus falciformis*), this is one of the most abundant sharks in warm oceanic waters. It occasionally enters coastal waters, but is more typically found from the edges of continental or insular shelves to far beyond land. This is a sluggish species, often accompanied by pilot fishes (*Naucrates ductor*), remoras (*Remora remora*), and sometimes dolphinfishes (*Coryphaena* species). Viviparous, number of embryos ranging from 6 to 9, size at birth to 75 cm.

Feeds mainly on fishes (especially scombrids and carangids) and squids; also crustaceans (especially portunid crabs), turtles and carrion. This species causes much damage to the catch in tuna fisheries, and formerly also to dead whales that were inflated and buoyed after harpooning by the whaling ships. Reported to be dangerous to humans, and prone to investigate divers and swimmers that venture into its offshore habitat.



## PRESENT FISHING GROUNDS:

Oceanic waters throughout its range.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with floating longlines, also drifting gillnets and hand-lines

Utilized fresh for human consumption; also processed for liver oil; fins probably used for the oriental sharkfin trade.

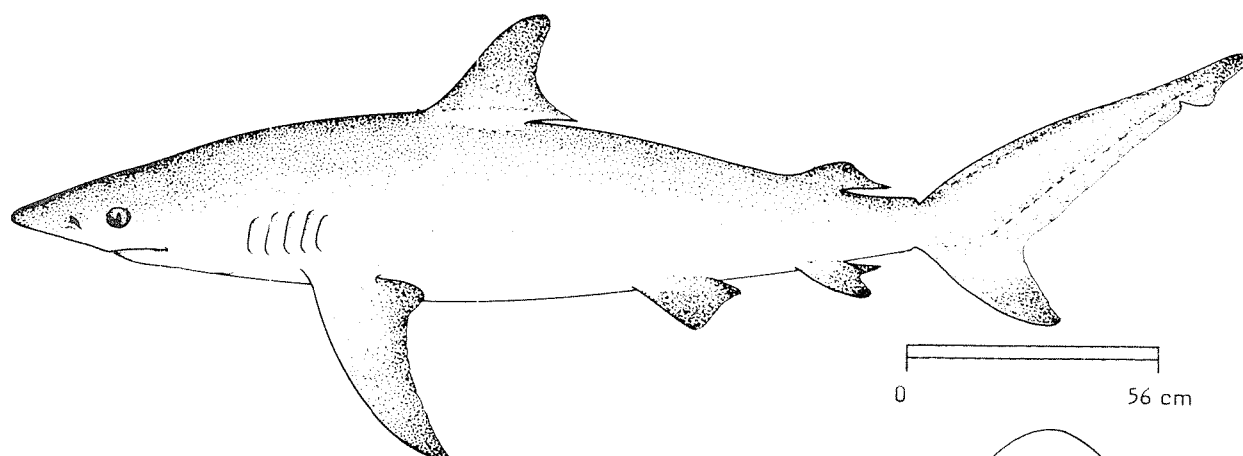
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

Carcharhinus obscurus (Le Sueur, 1818)

OTHER SCIENTIFIC NAMES STILL IN USE : Carcharhinus iranzae Fourmanoir, 1961



VERNACULAR NAMES:

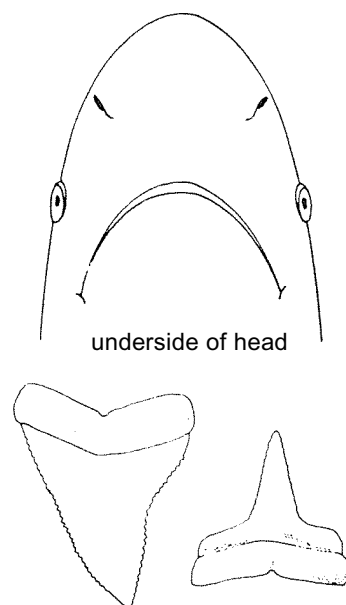
FAO : En - Dusky shark  
Fr - Requin sombre (= Réquiem de sable, Area 31)  
Sp - Tiburón arenero

NATIONAL:

DISTINCTIVE CHARACTERS:

Body slender to moderately stout. Snout rounded and short, its length equal to or less than mouth width and greater than or about equal to internasal space; labial folds short; anterior nasal flaps rudimentary; upper teeth broadly triangular, erect to moderately oblique, anterior teeth with strongly serrated broad cusps not delimited from the bases; lower teeth with low, narrow, serrated cusps; gill slits relatively short. First dorsal fin relatively low, with a broadly arched anterior margin and a narrowly rounded or pointed apex, its origin about over free rear tips of pectorals; second dorsal fin also rather low, with a nearly straight posterior margin, an inner margin nearly or quite twice the fin height, and its origin about over that of anal fin; pectoral fins falcate and apically pointed. A low dermal ridge between dorsal fins.

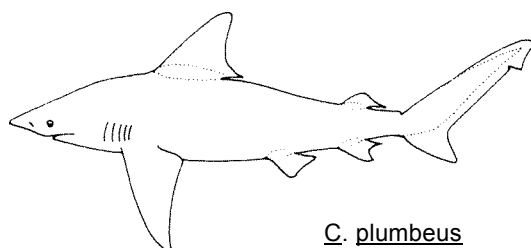
Colour: blue-grey, lead-grey above, white below. Tips of pectorals, pelvics, lower lobe of caudal and dorsal fins often dusky in young, plain in adults.



underside of head  
upper tooth and lower tooth near centre

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus plumbeus: first dorsal fin very high, its origin about over pectoral-fin insertions; upper front teeth narrower and more acutely pointed in adults; dermal denticles of back wide-spaced and without cusps (close-set and cuspidate in other Carcharhinus species in the area).



C. plumbeus

C. altimus: anterior nasal flaps prominent, snout longer; first dorsal fin higher, its origin over inner margins of pectoral fins; upper front teeth narrower and with more acute cusps in adults; pectoral fins broader, less falcate.

C. galapagensis: closely resembles C. obscurus and may be confused with that species. It differs in having somewhat higher dorsal fins, the first less convex anteriorly, the second with a more concave posterior margin and less falcate pectoral fins; also more vertebral centra (103 to 109 precaudal centra, against 86 to 97 in C. obscurus).

C. albimarginatus: strikingly conspicuous white-edged fins, less falcate pectoral fins, a slightly higher, posteriorly more concave second dorsal fin, fewer anteroposterior teeth, 12 to 14 in the upper jaw (usually 13, C. obscurus with 14 or 15), and much higher vertebral counts, 116 to 122 precaudal centra).

C. longimanus: pectoral fins very broad distally, not falcate; first dorsal fin higher, with a broadly rounded apex; free rear tip of anal fin nearly reaching lower caudal fin origin.

C. falciformis: cusps of upper teeth delimited from bases, which have coarse serrations or small cusplets; first dorsal fin more posterior, its origin behind free rear tips of pectoral fins, and with a more broadly rounded apex.

C. leucas, C. amboinensis and Glyphis gangeticus: snout shorter, first dorsal fin very broad and triangular, its origin far anterior, over or anterior to pectoral fin insertions; second dorsal fin much higher, origin anterior to that of anal fin; no interdorsal ridge.

Other species of Carcharhinus: upper teeth with narrow cusps, well defined from bases.

#### SIZE:

Maximum: about 364 cm, maturing at about 277 to 284 cm.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, known from South Africa, Madagascar and East Africa, but Red Sea records are uncertain; presently not known from the eastern part of the area. Elsewhere, wide-ranging in the Atlantic, eastern Indian Ocean and Pacific.

A semi-pelagic shark occurring from inshore waters to the outer continental shelf. Viviparous, number of embryos 6 to 14, size at birth about 69 to 102 cm.

Feeds chiefly on fishes, including scombrids, clupeids, serranids, trichiurids, bluefish, wrasses, anchovies, grunts, barracudas, sharks and rays, also squids, octopi, gastropods, shrimps, crabs and carrion. Reported to be dangerous to humans, but attacks in the area are unverified.

#### PRESENT FISHING GROUNDS:

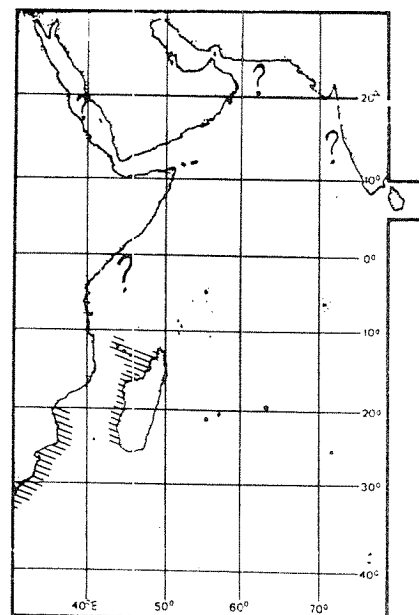
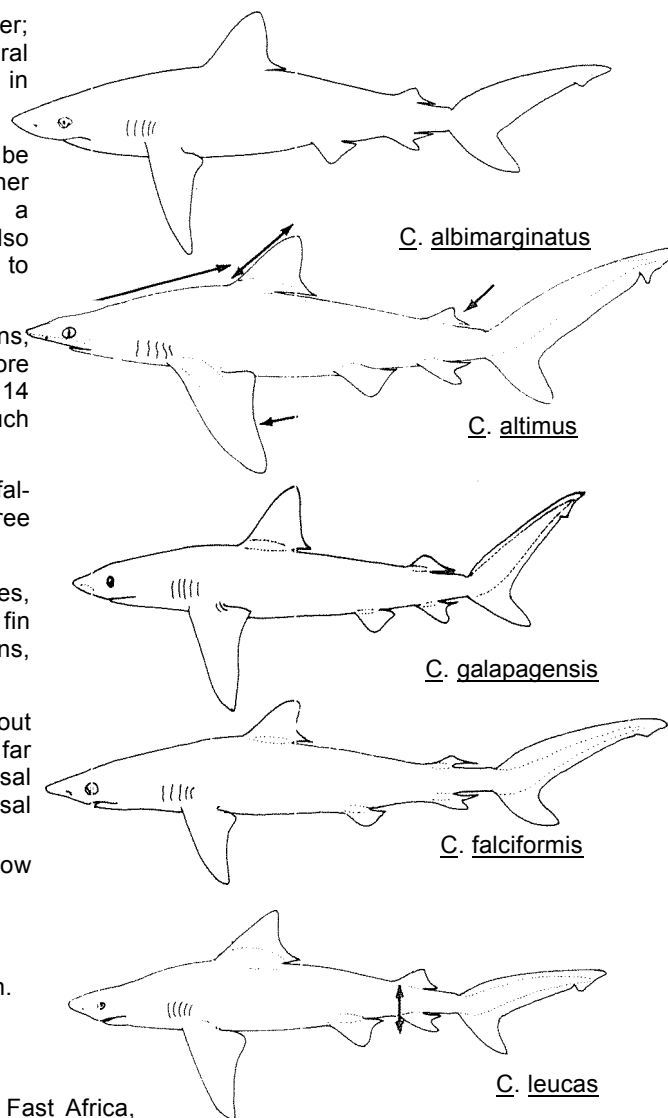
Probably East Africa, but details unknown.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Probably taken on line gear and in set and floating gillnets.

Mode of use uncertain.



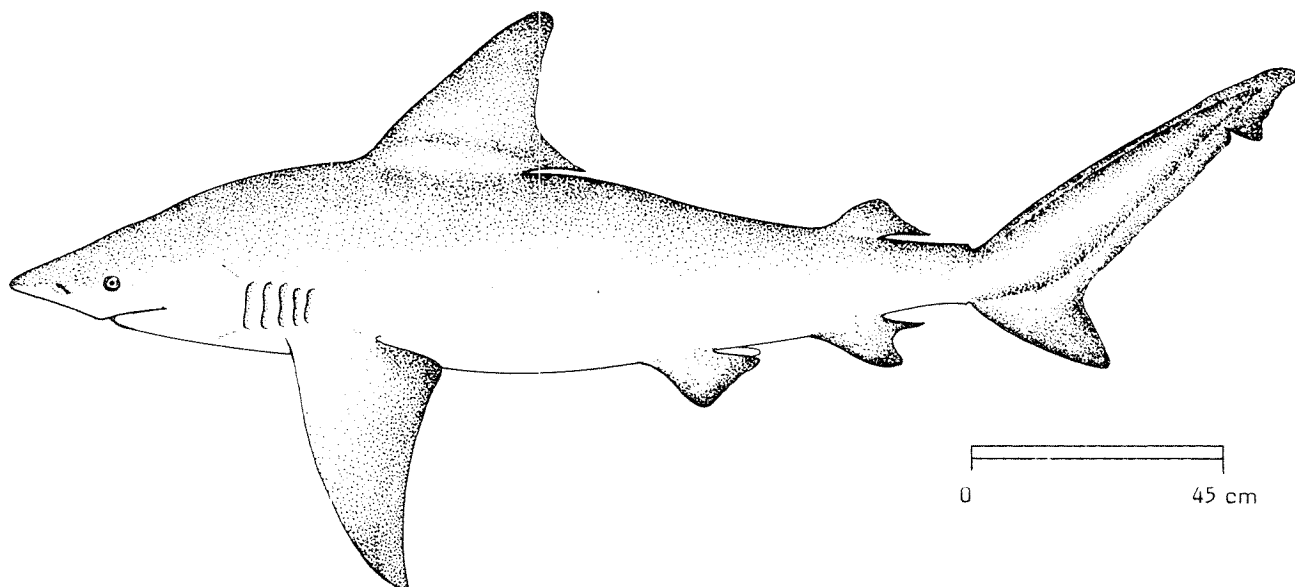
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

Carcharhinus plumbeus (Nardo, 1827)

OTHER SCIENTIFIC NAMES STILL IN USE: Carcharhinus milberti (Valenciennes, in Müller & Henle, 1841)



VERNACULAR NAMES:

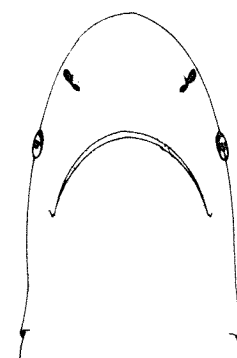
- FAO: En - Sandbar shark
- Fr - Requin gris (= Réquiem plombe, Area 31)
- Sp - Tiburón trozo (= Tiburón de Milberto)

NATIONAL:

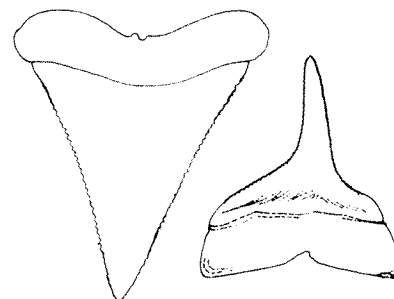
DISTINCTIVE CHARACTERS:

A medium-sized, comparatively stout shark. Snout broadly rounded and short, its length less than width of mouth but greater than distance between nostrils; spiracles absent; teeth finely serrate, those in upper jaw broadly triangular and erect to slightly oblique, with broad, heavy cusps; lower teeth with narrow, erect cusps. First dorsal fin triangular, very high (height of fin twice the length of snout in adults), with a pointed or narrowly rounded apex, its origin over insertions of pectoral fins; origin of second dorsal fin about: opposite that of anal fin, its inner margin less than twice the fin height; pectoral fins long and broad, their corners narrowly rounded or pointed. A dermal ridge present between dorsal fins. Dermal denticles widely spaced, their free edges without definite teeth.

Colour: back grey, or rarely brown; belly whitish.



underside of head



upper tooth and lower tooth near centre

### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

The combination of characters such as the large size and forward-position of first dorsal fin, the short posterior lobe of second dorsal fin, the broadly triangular upper teeth, the vestigial anterior nasal flaps, the presence of a mid-dorsal ridge and the widely spaced dermal denticles readily distinguishes this species from other carcharhinid sharks occurring in the area.

### SIZE:

Maximum: about 250 cm, records to 300 cm uncertain.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, it occurs from South Africa, Madagascar, and the Mauritius-Seychelles area to the Red Sea, the Gulf of Oman and the "Gulf", but is currently not known from the eastern part of the area. Elsewhere, wide-ranging in the Eastern and Western Atlantic, Mediterranean Sea, Eastern Indian Ocean, the Western and Central Pacific to the Hawaiian Islands; Eastern Pacific records are uncertain.

A coastal species usually found over sandy or muddy bottom; often coming near estuaries but sometimes occurring in oceanic waters to depths of 200 m. Viviparous, number of young 1 to 14. Size at birth 60 to 75 cm.

Feeds mainly on bottom-dwelling animals, including flatfishes, rays, crabs and snails; also on schooling fishes and squids. Not known to be dangerous to humans.

### PRESENT FISHING GROUNDS:

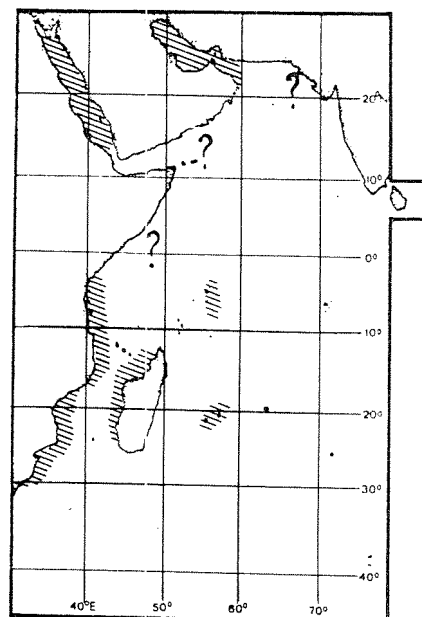
East African coast, probably also Madagascar.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Probably caught on line gear and in floating and bottom gillnets.

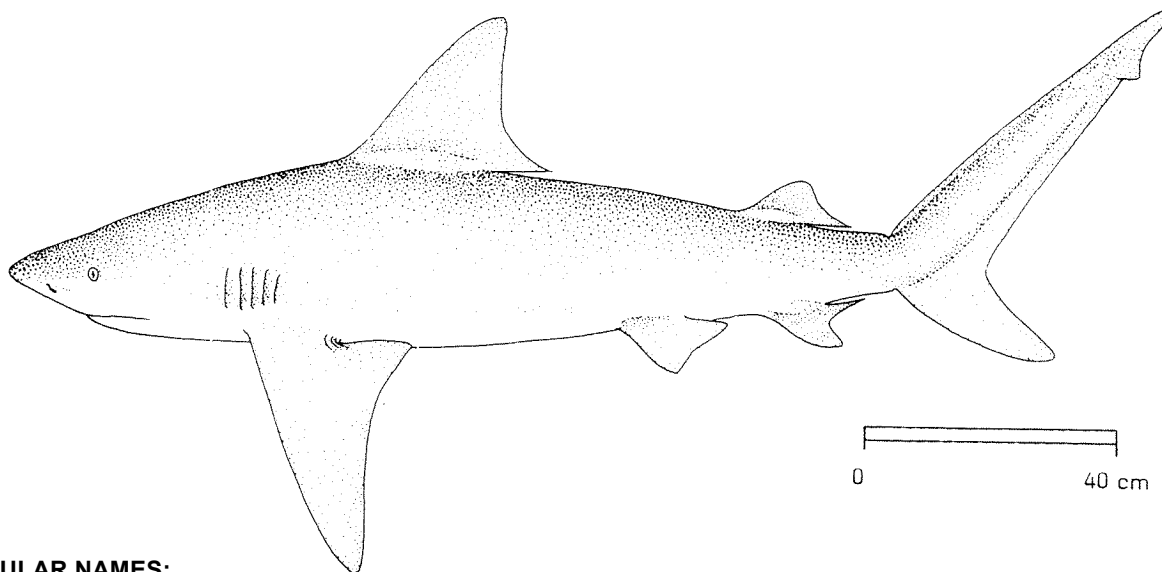
Probably utilized fresh for human consumption.





## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus amboinensis (Müller & Henle, 1839)OTHER SCIENTIFIC NAME'S STILL IN USE : Triaenodon obtusus Day, 1878 \*

## VERNACULAR NAMES:

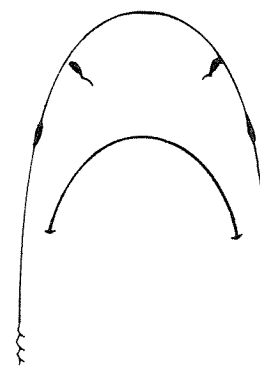
FAO : En - Pigeye shark  
Fr - Requin balestrine  
Sp - Tiburón baleta

NATIONAL :

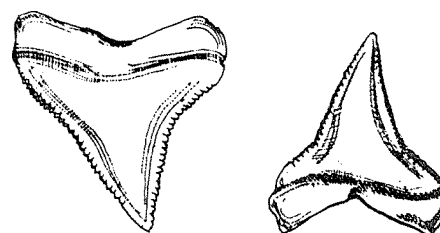
## DISTINCTIVE CHARACTERS:

A medium to large, stout-bodied shark. Snout extremely short (usually shorter than distance between nostrils, and much shorter than mouth width), very broadly rounded; labial furrows very short; spiracles absent; nostrils with a low, broadly triangular anterior nasal flap; teeth in upper jaw triangular, with broad, heavy, serrated cusps, their outer edges nearly straight in anterior teeth but becoming increasingly concave in lateral teeth; cusps of lower teeth heavy, erect to slightly oblique with serrated edges, their bases strongly arched. First dorsal fin very high (its height 3.2 or more times that of second dorsal fin) with a pointed or slightly rounded apex, its origin a little in advance of insertions of pectoral fins; second dorsal fin low, with its inner margin about equal to fin height, its posterior margin nearly straight, and its origin slightly in front of anal fin; pectoral fins large, broad, with narrow, pointed tips. No dermal rime between dorsal fins.

Colour: grey above, light below, tips of fins darker in young, fading in adults.



underside of head



upper and lower lateral teeth

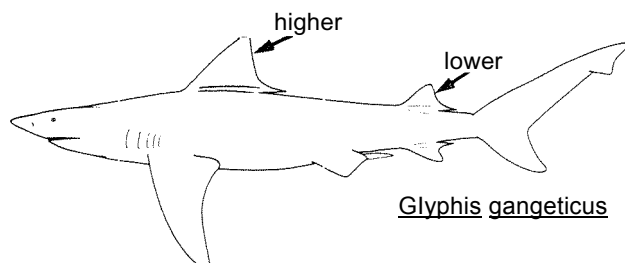
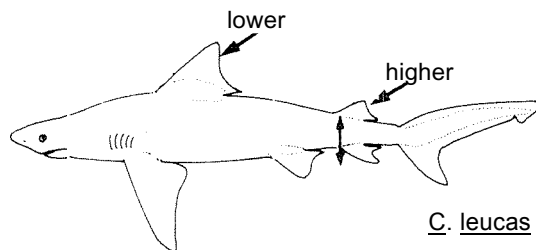
\* Examination of the holotype of Triaenodon obtusus Day, 1878 revealed that the specimen, a skin in alcohol, is apparently a term fetus of C. amboinensis, and is clearly not referable to the genus Triaenodon

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus leucas: closely resembles this species, but differs in having a lower first dorsal fin and a higher second dorsal (height of latter less than 3.2 times that of first dorsal) and also more vertebrae (109 to 120 precaudal vertebrae in C. leucas but only 89 to 95 in C. amboinensis)

Glyphis gangeticus: second dorsal fin much higher, its height about half that of first dorsal, eye smaller, upper teeth higher crowned, lower teeth much longer and conspicuously hooked, precaudal pit in the form of a narrow longitudinal pit (transverse and crescentic in all Carcharhinus in the area, including C. amboinensis).

Other species of Carcharhinus in the area with broad, triangular upper teeth: first dorsal fin and pectoral fins with broadly rounded tips (C. longimanus), snout longer, bases of lower teeth usually not arched, interdorsal ridge present (C. plumbeus, C. obscurus, C. altimus, C. galapagensis, C. albimarginatus).



## SIZE:

Maximum: about 280 cm, maturing at about 200 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, known from off South Africa, western Madagascar, Pakistan, and Sri Lanka, but probably more widespread. Elsewhere from the Eastern Atlantic and Western South Pacific.

An inshore as well as offshore continental species occurring from the surfline to 60 m depth. Apparently not ascending rivers like C. leucas or Glyphis gangeticus. Viviparous, size at birth about 75 cm length.

A bottom-feeding shark preying on croakers, flatfish, small sharks and skates, and shrimp. Potentially dangerous to people, but not recorded in shark attacks to date.

## PRESENT FISHING GROUNDS:

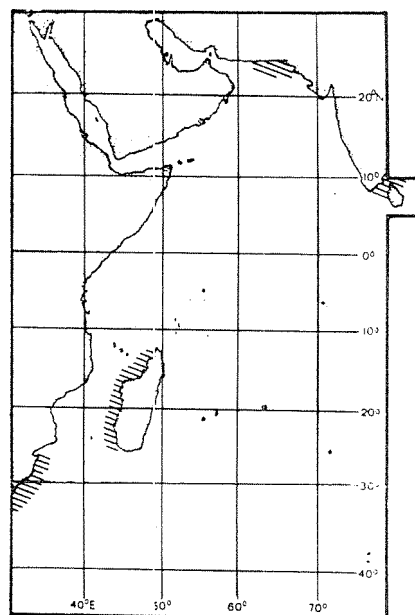
In the area, both inshore and offshore.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :

Separate statistics are not reported for this species.

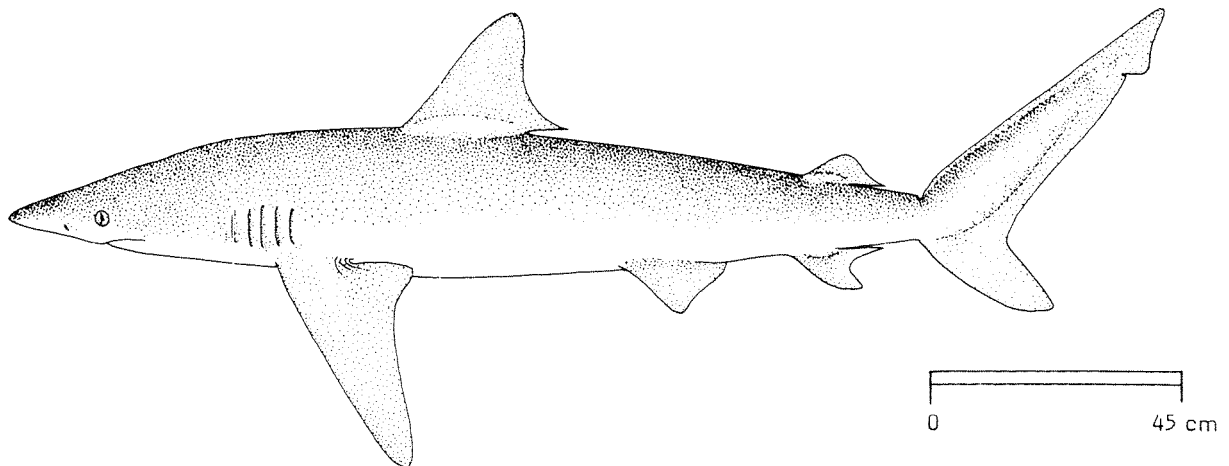
Probably caught on longlines and in gillnets.

Probably utilized fresh and dried-salted.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus brachyurus (Günther, 1870)OTHER SCIENTIFIC NAMES STILL IN USE : Carcharhinus improvisus Smith, 1952

## VERNACULAR NAMES:

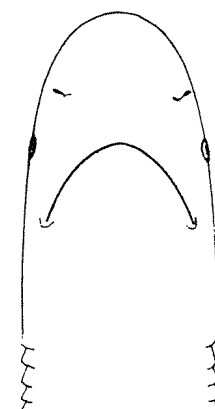
FAO :           En - Copper shark  
                  Fr - Requin cuivre  
                  Sp - Tiburón cobrizo

NATIONAL:

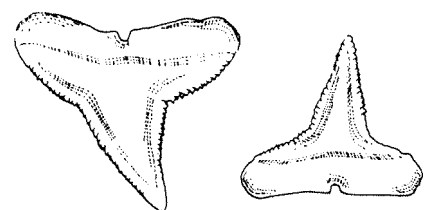
## DISTINCTIVE CHARACTERS:

A large, slender to moderately stout shark. Snout rounded, its length about equal to, or somewhat smaller than width of mouth, but greater than internasal space; labial folds short; anterior nasal flaps very short to rudimentary; upper teeth with narrow, mostly oblique, somewhat flexed cusps, well-delimited from the tooth bases and finely serrated; lower teeth with moderately high, narrow, erect to semioblique, weakly serrated, cusps; gill slits relatively short. First dorsal fin moderately high, with a nearly straight anterior margin and a narrowly rounded or pointed apex, its origin over inner margins of pectoral fins; second dorsal fin moderately high, with a slightly concave posterior margin and an inner margin much shorter than half the height of fin; its origin over that of anal fin; pectoral fins not strongly falcate, apically pointed. Usually no dermal ridge between dorsal fins (occasionally a weak ridge present)

Colour: dark brownish grey above, white below; fins mostly plain, except for dusky tips on pelvics, as well as dusky to black tips and rear edges on pectoral fins.



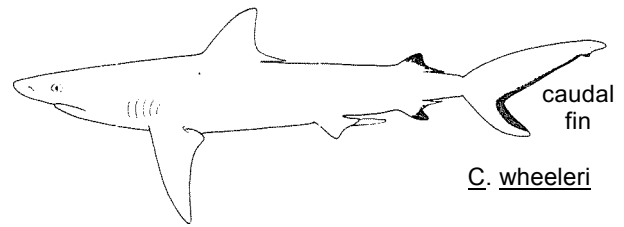
underside of head



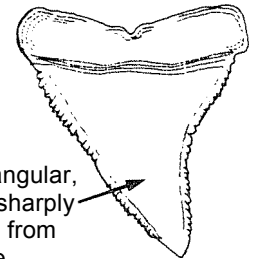
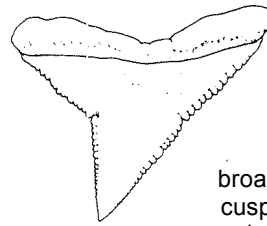
upper and lower lateral teeth

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Carcharhinus amblyrhynchos and C. wheeleri: upper anteriolateral tooth rows fewer, less than 14 on each side; posterior margin of caudal fin with a broad, conspicuous black edge.

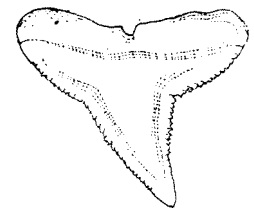
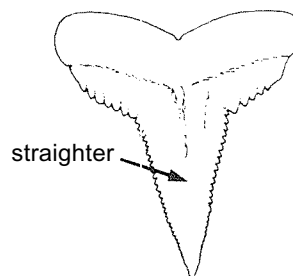


C. falciformis, C. macloti and C. hemiodon: bases of upper teeth with heavy serrations or cusplets; free rear tip of second dorsal fin more elongate, especially so in C. falciformis and C. macloti. Furthermore, a dermal ridge present between dorsal fins in C. falciformis and C. hemiodon; C. macloti and C. hemiodon with unserrated or weakly serrated upper tooth cusps; C. hemiodon with conspicuously black-tipped fins.



C. obscurus, C. galapagensis, C. altimus and C. plumbeus: upper anterior teeth broadly triangular; a dermal ridge present between dorsal fins.

C. limbatus, C. brevipinna and C. amblyrhynchoides: upper teeth with narrower, more erect cusps, snout more pointed, gill slits longer.



Other species of Carcharhinus in the area differ in having differently shaped upper anterior teeth and often conspicuous markings.

**SIZE:**

Maximum: about 290 cm, maturing at between 200 to 250 cm, with females somewhat larger than males.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

The occurrence of this species within the area is marginal, off South Africa, because of its apparent preference for temperate waters, but widespread misidentification of Carcharhinus species in the area make this uncertain. Elsewhere, in the Eastern Atlantic off Guinea, and Angola to Namibia and South Africa; also in the Mediterranean Sea, in the Western Pacific from Japan, China, Australia, New Zealand; and Eastern Pacific from California, Baja California and the Gulf of California and Peru.

A coastal and offshore shark, with a preference for warm-temperate seas. Viviparous, number of fetuses 13 to 20, size at birth about 60 to 70 cm.

Feeds on bottom-dwelling bony fishes, including gurnards, flatfishes, hakes, puffers, sea catfishes, jacks and mullets; also on rays, small sharks, squids and cuttlefishes. Dangerous to man, implicated in shark attacks on people.

**PRESENT FISHING GROUNDS:**

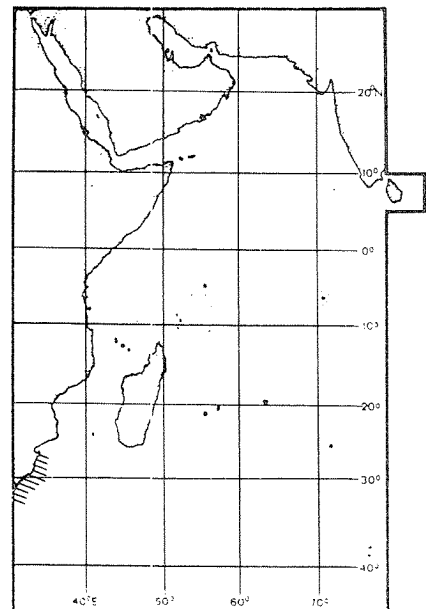
Uncertain, caught for sport off South Africa.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Method of capture unrecorded.

Utilization uncertain.

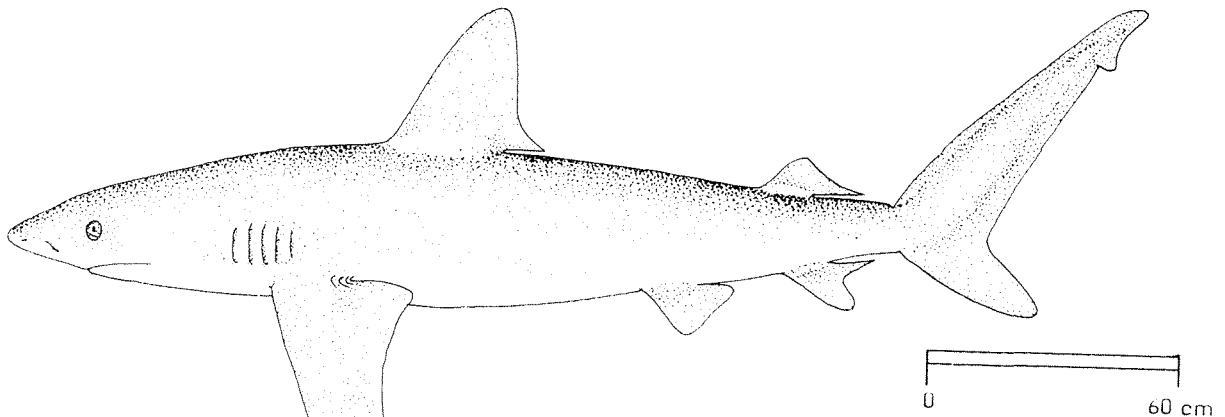


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus galapagensis (Snodgrass & Heller, 1905)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

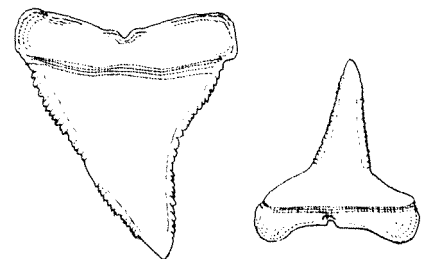
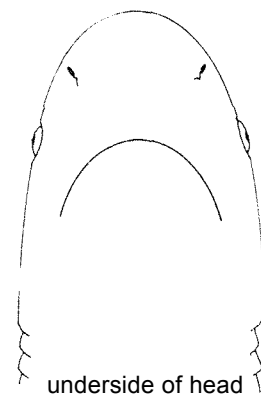
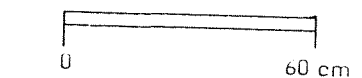
FAO :           En - Galapagos shark  
                  Fr - Requin de Galapagos  
                  Sp - Tiburón de Galapagos

NATIONAL :

## DISTINCTIVE CHARACTERS:

A large, slender to moderately stout shark. Snout rounded and short, its length equal to or less than mouth width and about equal to or greater than internasal space; labial folds short; anterior nasal flaps rudimentary; upper teeth broadly triangular, erect to moderately oblique, the anterior ones strongly serrated and with higher, broad cusps not delimited from the bases; lower teeth with high, narrow cusps and serrations; gill slits relatively short. First dorsal fin rather high, nearly straight anteriorly, with a narrowly rounded or pointed apex, its origin over inner margins of pectoral fins; second dorsal moderately high, with a concave posterior margin, its inner margin less than twice the fin height and its origin over or slightly anterior to that of anal fin; pectoral fins nearly straight and apically pointed. A low dermal ridge between dorsal fins.

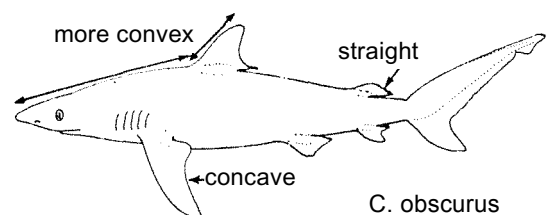
Colour: dark grey above, light below, fins plain except for slightly dusky tips in some individuals.



upper and lower lateral teeth

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus obscurus: closely resembles C. galapagensis and is sometimes mistaken for it, but differs in the shape of its first dorsal fin (lower and anteriorly more convex, apically more broadly rounded), the lower-cusped teeth, the lower second dorsal fin with a nearly straight posterior margin, and the more falcate pectoral fins; it also has fewer vertebral centra (86 to 97 precaudal centra, against 103 to 109 in C. galapagensis).



C. amblyrhynchos and C. wheeleri: cusps of upper teeth narrow, posterior edge of caudal fin with a conspicuous black margin.

C. albimarginatus: similar to C. galapagensis, but with striking white-edged fins.

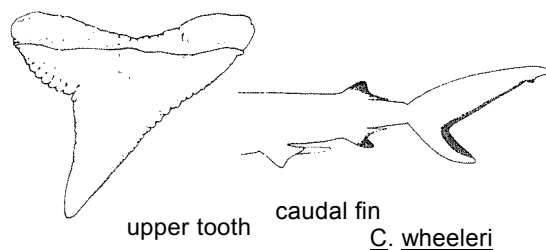
C. plumbeus: first dorsal higher, its origin about over pectoral fin insertions; dermal denticles of back wide-spaced and without cusps (close-set and cuspidate in other Carcharhinus species in the area).

C. altimus: snout longer, anterior nasal flaps high and prominent, interdorsal ridge higher, pectoral fins laterally broader.

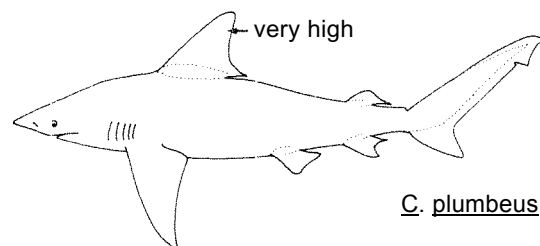
C. brachyurus: Cusps of upper teeth narrow, oblique and flexed, well-delimited from bases, usually no interdorsal ridge, colour of back more coppery in life.

C. falciformis: cusps of upper teeth delimited from bases, which have coarse serrations or small cusplets; first dorsal fin more posterior, its origin behind free rear tips of pectoral fins, and with a more broadly rounded apex.

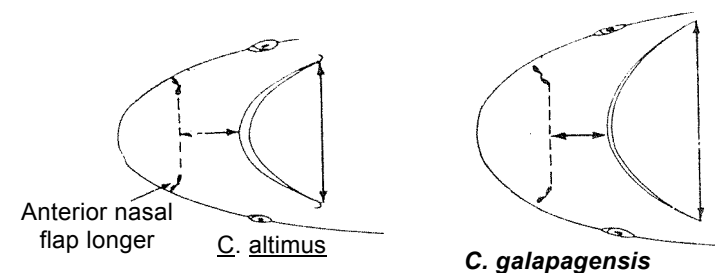
Other species of Carcharhinus: upper teeth with narrow cusps, well-defined from bases (except C. leucas and C. amboinensis, which lack interdorsal ridges).



upper tooth caudal fin C. wheeleri

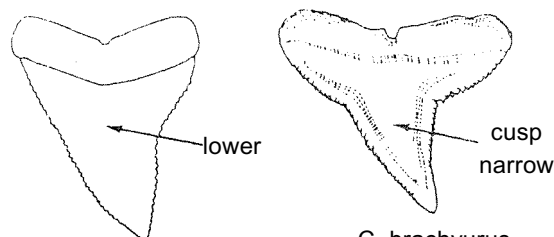


C. plumbeus



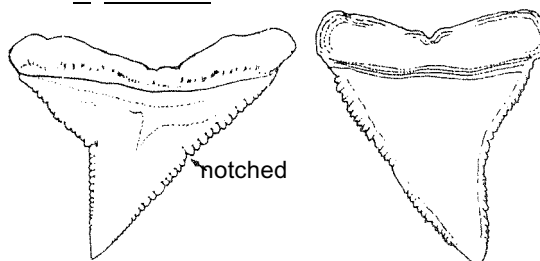
Anterior nasal flap longer C. altimus

C. galapagensis



C. obscurus

C. brachyurus



C. falciformis

C. galapagensis

#### SIZE :

Maximum: about 370 cm; common to 300 cm.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

A wide-ranging, inshore and offshore shark often preferring the waters around islands to those of the continental shelf. At present only known from Walters Shoal, off southern Madagascar, but likely to occur off islands elsewhere in the area. Widely distributed, but of spotty occurrence in the tropical Pacific and Atlantic, primarily off island groups but offshore in continental waters in Eastern Pacific.

Viviparous, number of fetuses 6 to 16; size at birth about 57 to 78 cm.

Feeds on bottom fishes, including basses, flat reads, eels and flatfishes; also on cephalopods and bivalves. An aggressive species, dangerous to people.

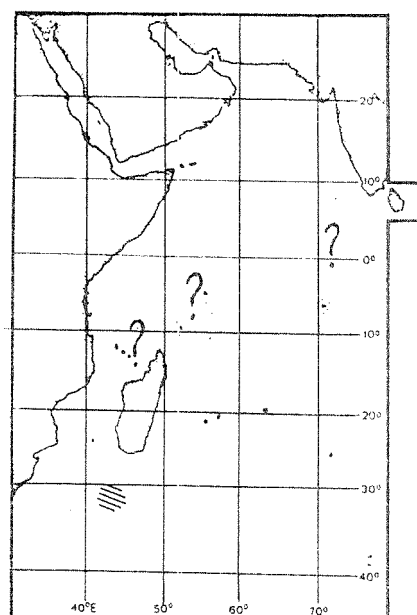
#### PRESENT FISHING GROUNDS:

Not well known, since the species is most probably often confused with other carcharhinid sharks.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not collected for this species.

No information is available on fishing gear or utilization.

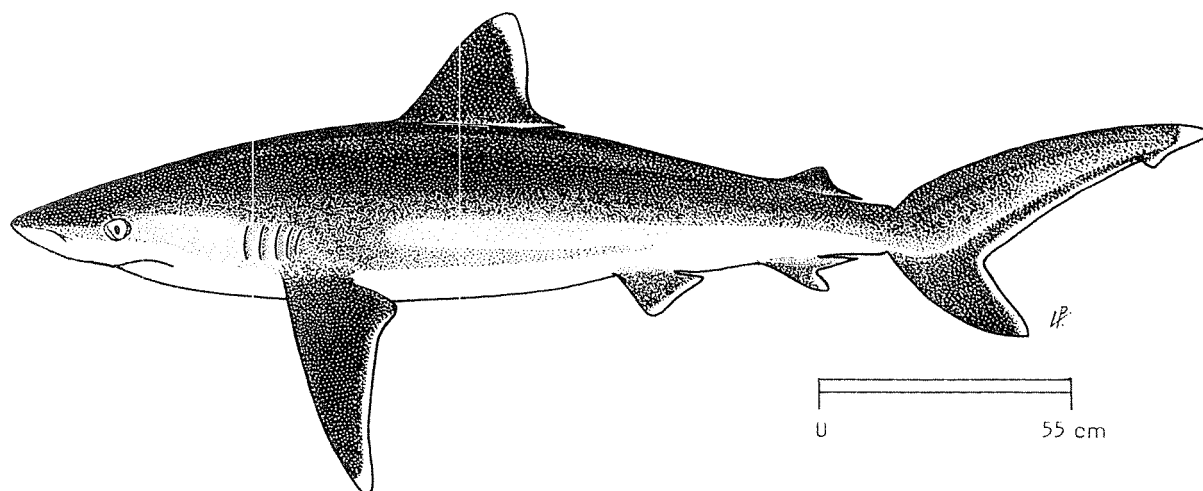


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus albimarginatus (Rüppell, 1837)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

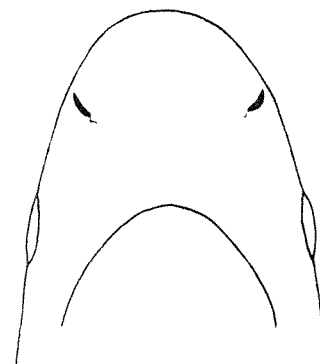
FAO : En - Silvertip shark  
Fr - Requin pointe blanche  
Sp - Tiburón de puntas blancas

NATIONAL:

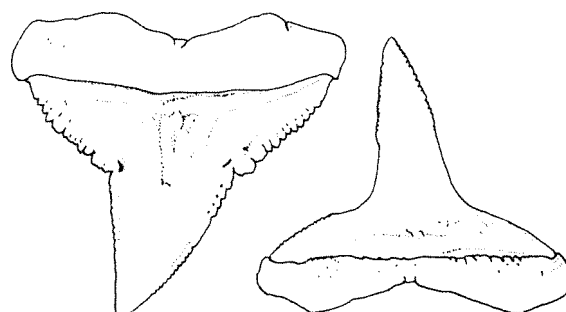
## DISTINCTIVE CHARACTERS:

A large slender to moderately stout shark. Snout moderately long and broadly parabolic, its length subequal to or slightly shorter than the mouth width and equal to or greater than internasal space; labial folds very short; anterior nasal flaps very low; spiracles absent; teeth with serrated edges, upper teeth broadly triangular and erect in front of mouth, progressively oblique posteriorly, without conspicuous cusplets; teeth in lower jaw erect and stout-cusped, serrated. First dorsal fin moderately high, with a narrowly rounded apex, its origin over inner margins of pectoral fins; origin of second dorsal about opposite anal fin origin; second dorsal fin moderately high, its inner margin less than twice its height, its posterior margin nearly straight; pectoral fins long and slightly falcate, with narrow, pointed tips. A dermal ridge present between dorsal fins.

Colour: dorsal surface dark grey or grey-brown, ventral surface white; all fins have conspicuous white tips and posterior margins.



underside of head

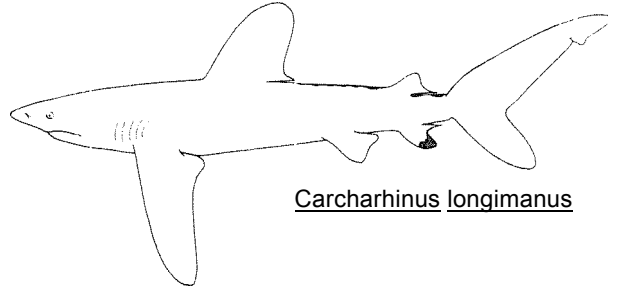
upper tooth and lower tooth  
near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

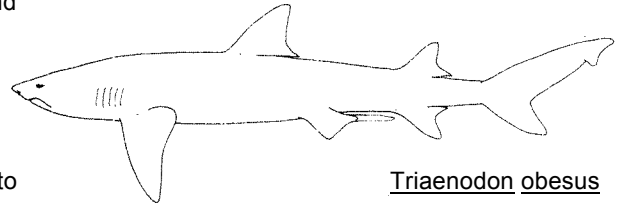
Carcharhinus longimanus: often has the tips of first dorsal and pectoral fins, and ventral caudal lobe white-tipped or spotted (sometimes absent); first dorsal and pectoral fins larger, with broad, rounded tips; anal fin free, rear tip nearly reaching lower caudal origin (well anterior to it in C. albimarginatus); second dorsal, anal fins and ventral caudal lobe often with black spots.

Triaenodon obesus has white-tipped fins; snout shorter and very broadly rounded; teeth smooth-cusped and with cusplets in both jaws; anterior nasal flaps greatly expanded and tubular; first dorsal fin more posterior, origin behind pectoral rear tips; second dorsal much larger, nearly as large as first.

No other shark in the area has conspicuous white tips and edging on all its fins.



Carcharhinus longimanus



Triaenodon obesus

## SIZE:

Maximum: about 300 cm; adults maturing at 160 to 199 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, in the Red Sea and Indian Ocean off South Africa, Mozambique, Kenya, Madagascar, Aldabra group, Mauritius, Seychelles, and the Chagos Archipelago; elsewhere from the Western Central Pacific, Eastern Pacific and possibly the Western North Atlantic.

An inshore and offshore continental and insular species occurring from the surface to 800 m depth, close inshore in lagoons and near island dropoffs or well offshore, but not oceanic. Viviparous, number of embryos 1 to 11, size at birth about 63 to 68 cm.

Feeds on both bottom and pelagic fish, including rays, and octopi. Can be aggressive to divers and is potentially dangerous.

## PRESENT FISHING GROUNDS:

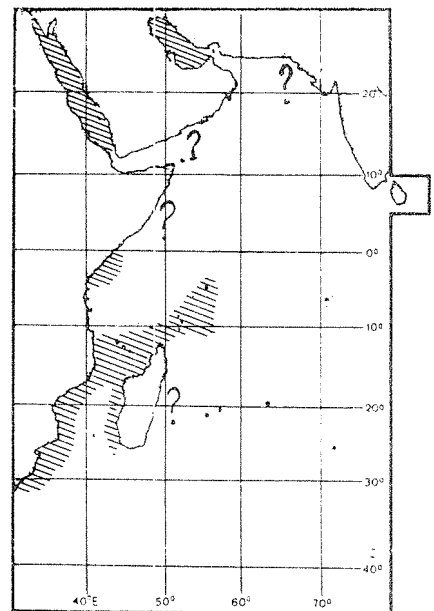
Seychelles, Red Sea and probably elsewhere where it occurs.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with line gear and gillnets.

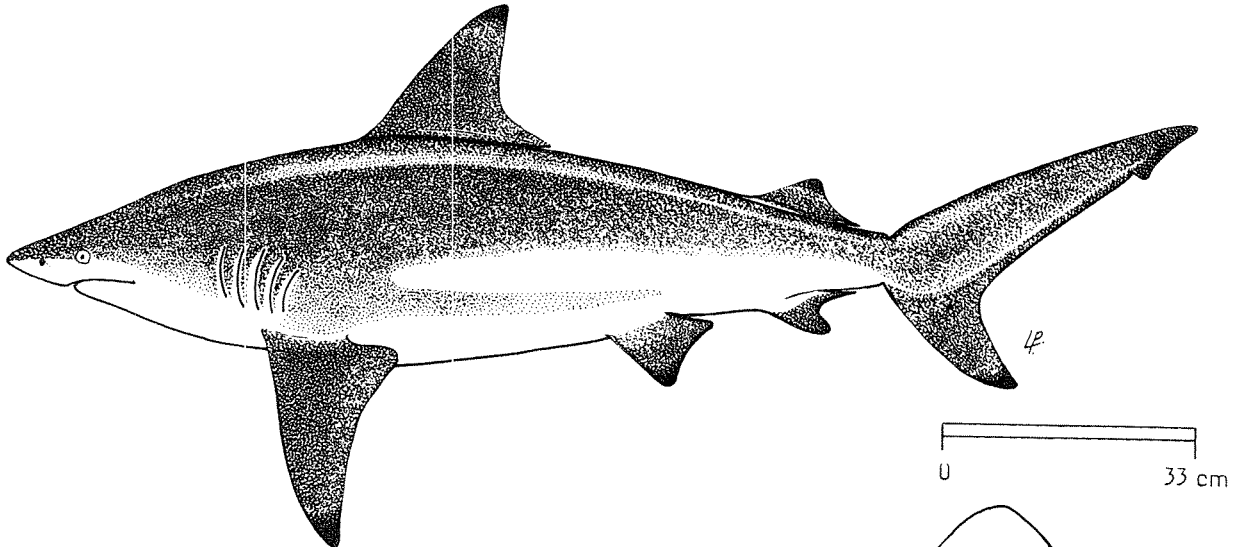
Probably used fresh and dried salted for human consumption..





## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)*Carcharhinus amblyrhynchoides* (Whitley, 1934)OTHER SCIENTIFIC NAMES STILL IN US: *Carcharhinus leurotaenia* (Bleaker, 1852)

## VERNACULAR NAMES:

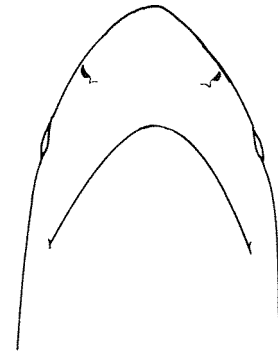
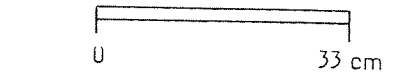
FAO :           En - Graceful shark  
                  Fr - Requin gracile  
                  Sp - Tiburón grácil

NATIONAL:

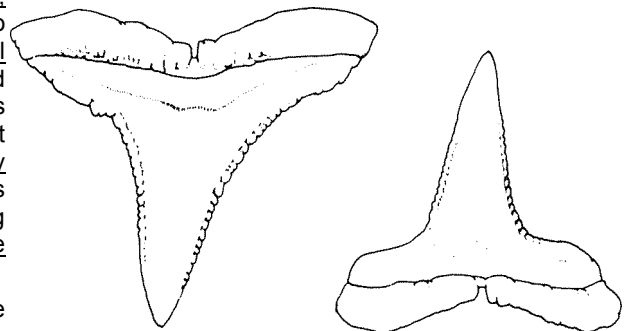
## DISTINCTIVE CHARACTERS:

A medium-sized stout shark. Snout pointed but short, its length less than mouth width, 1.0 to 1.2 times internasal space; labial furrows very short; anterior nasal flaps very low; no spiracles; upper and lower teeth with serrated edges, including cusps, upper teeth with narrow cusps, and no prominent clisplets, not broadly triangular, cusps of upper anterior teeth erect, laterals erect to oblique; lower teeth erect and narrow-cusped. First dorsal fin moderately high, with an angular or narrowly rounded apex and short inner margin, its origin over inner margins of pectoral fins; origin of second dorsal fin about opposite anal fin origin; second dorsal fin moderately high, its inner margin less than twice its height, its posterior margin concave; pectoral fins moderately long and falcate, with narrow, pointed tips. No dermal ridge between dorsal fins.

Colour: grey or grey-brown on dorsal surface, white or cream below, with a conspicuous band of white on sides from pelvic fins to first dorsal; pectorals, dorsals, pelvics and ventral lobe of caudal fin black or dusky-tipped, sometimes inconspicuously so.



underside of head



upper tooth

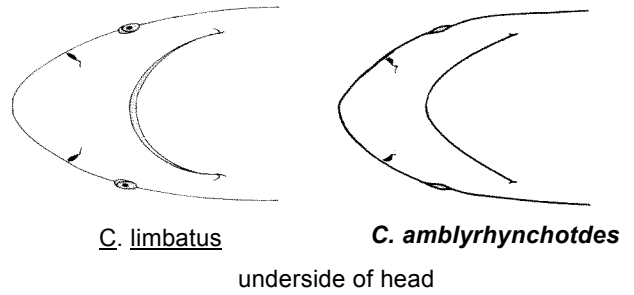
and lower tooth  
near centre

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Carcharhinus limbatus: very similar to this species, except for its conspicuously longer, narrowly pointed snout; internasal space 1.3 to 1.7 times snout length.

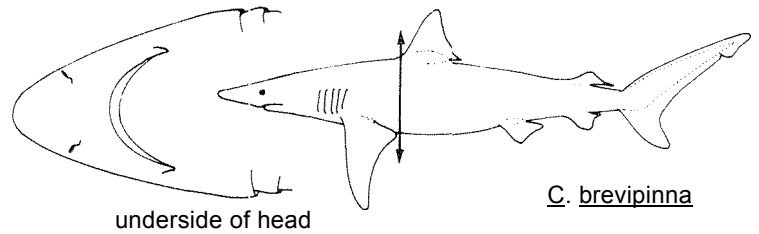
C. brevipinna: more slender, with a conspicuously longer, narrowly pointed snout; internasal space 1.5 to 1.8 times preoral snout length; first dorsal fin lower, its origin over or behind free rear tips of pectoral fins; upper labial folds longer; lower teeth with smooth or weakly serrated edges.

No other species of Carcharhinus have the combination of the following characters: pointed snout, erect and narrow-cusped upper teeth with no cusplets and serrated cusps, relatively long gill slits, no interdorsal ridge, and a relatively high second dorsal fin with short inner margins and free rear tips.



**SIZE:**

Maximum: 167 cm.



**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, from the Gulf of Aden, India and Sri Lanka, but probably more wide-ranging than currently known because of confusion with other species. Elsewhere, in the Western Pacific to Vietnam, the Philippine Islands and Australia.

A poorly known, inshore, coastal pelagic species. Viviparous, size at birth about 52 to 55 cm.

Food not recorded, probably mainly fishes.

**PRESENT FISHING GROUNDS:**

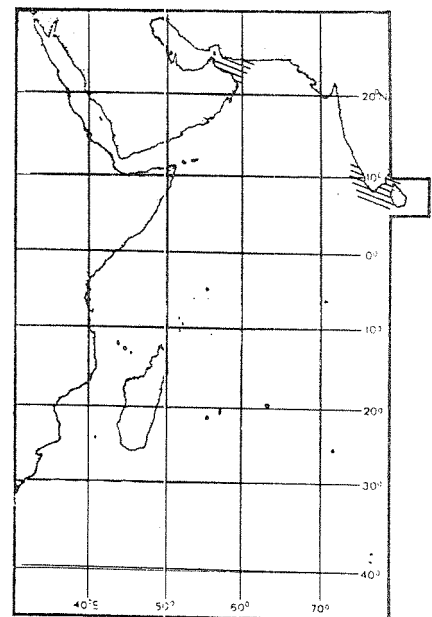
Sri Lanka and India, but probably taken more widely in the area by inshore fisheries.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

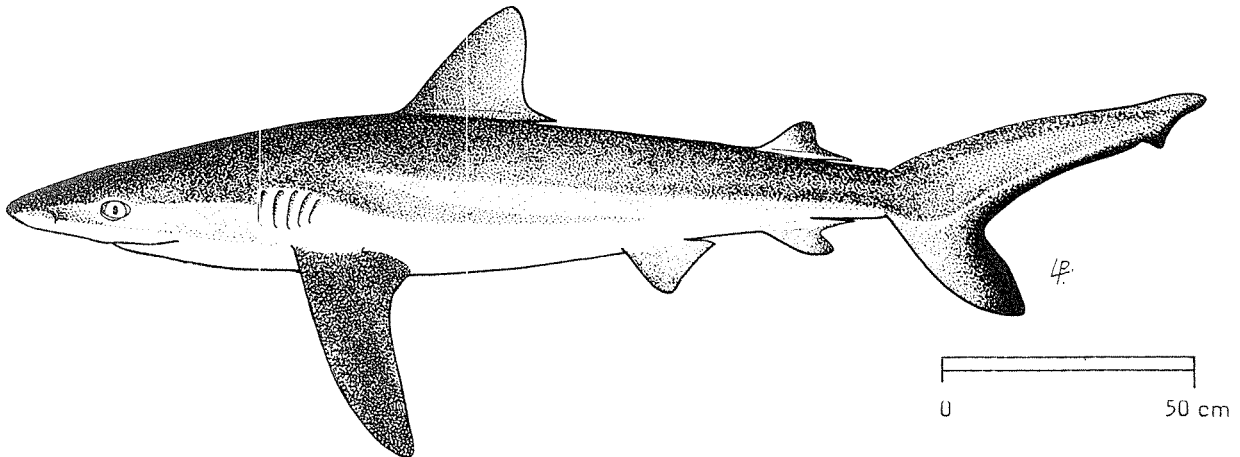
Taken on longlines and drifting gillnets.

Utilized fresh for human consumption; fins of larger individuals used in the oriental sharkfin trade; liver oil is processed for vitamins.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus amblyrhynchos (Bleeker, 1856)OTHER SCIENTIFIC NAMES STILL IN USE : Carcharhinus menisorrah (Valenciennes, in Müller & Henle, 1839)

## VERNACULAR NAMES:

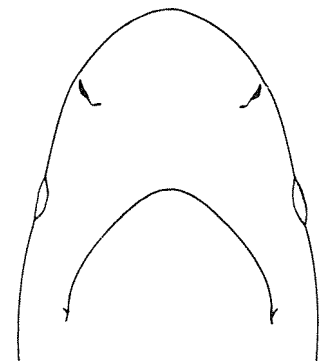
FAO :           En - Grey reef shark  
                   Fr - Require dagsit  
                   Sp - Tiburón de arrecifes

NATIONAL :

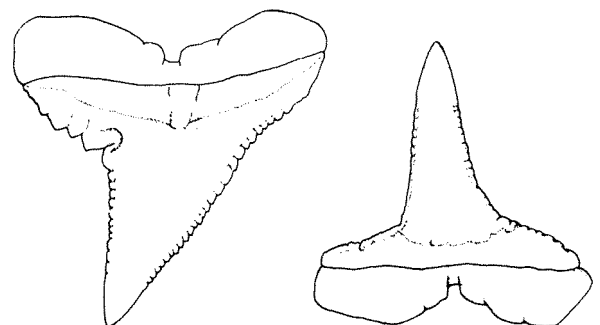
## DISTINCTIVE CHARACTERS:

A medium-sized shark. Body rather stout. Snout broadly rounded, its length less than mouth width, equal to or somewhat greater than internasal space; labial furrows very short; anterior nasal flaps very low; no spiracles; teeth with serrated edges but with cusplets low or absent on upper teeth, always absent on: lowers; upper teeth narrowly triangular, high, moderately narrow and erect-cusped in front of mouth, progressively oblique posteriorly; teeth in lower jaw mostly erect and narrow cusped. First dorsal fin moderately high and with a narrowly rounded apex, its origin over inner margins of pectoral fins; origin of second dorsal about opposite anal fin origin; second dorsal fin moderately high, its inner margin less than 1.5 times the fin height and its posterior margin deeply notched; pectoral fins long and not strongly falcate, with narrow, angular apices. A weak interdorsal ridge present between dorsal fins, or no ridge.

Colour: dark grey or bronze-grey; above, white below; caudal fin with a conspicuous wide black posterior margin; undersides of pectoral and pelvic fins with black tips and posterior margins, but fins otherwise not conspicuously black, or white-tipped.



underside of head



upper tooth

and lower tooth  
near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus wheeleri: very similar to C. amblyrhynchos, and possibly not distinct. Usually with a white-tipped first dorsal fin, also a slightly shorter snout 6.4 to 7.9 percent of total length, versus 5.8 to 8.7 percent in C. amblyrhynchos).

Other species of Carcharhinus: no other species in the area have the following combination of characters; moderately stout body, broadly rounded but moderately short snout, serrated, narrow-cusped, partially oblique teeth, high dorsal fins, straight pectoral fins and a broad black caudal margin as the only conspicuous markings.

### SIZE:

Maximum: about 255 cm; most adults smaller.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, known from off Madagascar and the Mauritius-Seychelles area, possibly also India (a single Indian record of the species, without locality, may have been within the boundaries of the area). Elsewhere, Singapore east to the Philippine Islands, Hawaiian Islands, Australia, New Guinea and the Tuamotu Archipelago, with a wide range in the Central Pacific.

An inshore shark, commonest over coral reefs, often near the bottom. Viviparous, size at birth about 50 to 60 cm; number of young per litter 1 to 6.

A bottom-feeding shark, eating small reef fishes and octopi. Aggressive, particularly when attracted by spearfishing or when cornered by divers; when provoked, gives an exaggerated swimming display, with back arched and pectoral fins thrust downward, followed by a swift attack and bite if the provocation continues. Several divers have been bitten by this shark in the Western Pacific, none fatally, and even small diver-operated submarines have been attacked.

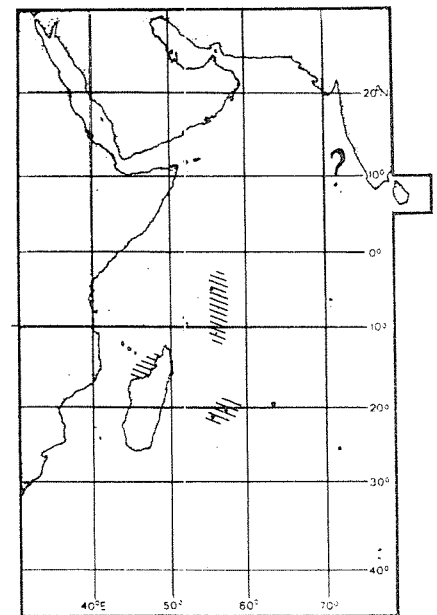
### PRESENT FISHING GROUNDS:

Off Madagascar.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Uncertain for the area.

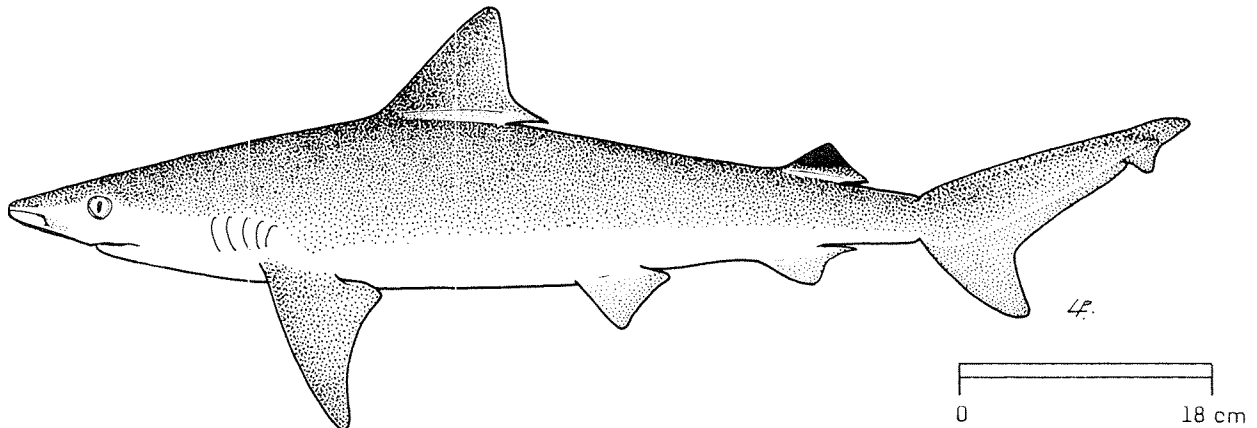


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus dussumieri (Valenciennes, in Müller & Henle, 1839)

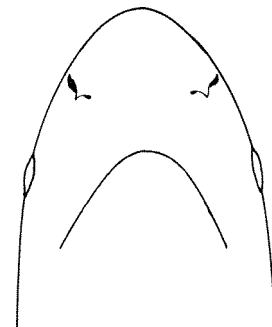
## OTHER SCIENTIFIC NAMES STILL IN USE:

Carcharhinus menisorrah (Valenciennes, in Müller & Hanle, 1839)Carcharhinus tjujot (Bleeker, 1852)

## VERNACULAR NAMES:

FAO : En - Whitecheek shark  
Fr - Requin à joues blanches  
Sp - Tiburón cariblanco

NATIONAL:

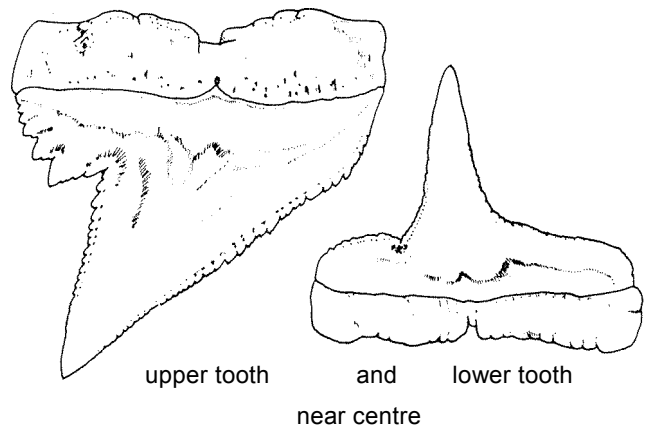


underside of head

## DISTINCTIVE CHARACTERS:

A small shark. Body moderately stout. Snout moderately long and broadly parabolic or wedge-shaped, its length usually shorter than mouth width but subequal to the internasal space; labial furrows very short; anterior nasal flaps expanded; spiracles absent; gill slits short; teeth with serrated edges, upper teeth with narrow-based, strongly oblique cusps and strong, serrated cusplets; teeth in lower jaw erect to oblique, without cusplets, serrated and narrow-cusped; first dorsal fin moderately high, with an angular apex, posteroventrally sloping, straight posterior margin, and short inner margin, not falcate; origin of first dorsal fin over pectoral inner margins; origin of second dorsal fin about opposite that of anal fin; second dorsal fin high, its inner margin less than 1.5 times the fin height and its posterior margin concave; pectoral fins short and not strongly falcate, with narrow, angular apices. An interdorsal ridge present or occasionally absent on back.

Colour: back greyish or grey-brown, belly whitish. A black spot on the second dorsal fin is the only conspicuous marking.



upper tooth

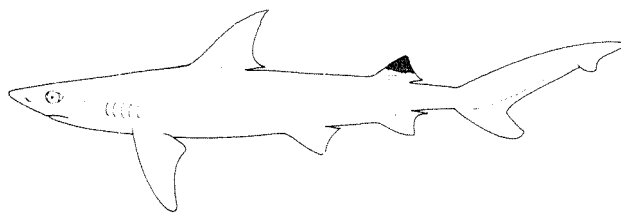
and lower tooth

near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus sealei: snout usually narrower, upper teeth with smooth-edged cusplets, pectoral and first dorsal fins falcate, posterior margins deeply concave.

Other species of Carcharhinus in the area do not combine the characters of small size, narrow to broad, parabolic snouts, strongly oblique upper; teeth with strong cusplets, long anterior nasal flaps, interdorsal ridges usually present, and black-tipped second dorsal fins as the only conspicuous markings.



Carcharhinus sealei

## SIZE:

Maximum: 1 m or less.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

As presently known, confined to the northern and eastern parts of the area, from the Gulf of Oman and the "Gulf" to the southern tip of India and presumably Sri Lanka. Elsewhere in the eastern Indian Ocean and Western Pacific eastward to Thailand, China, Japan, Java and Borneo.

A small, common shark of continental and insular inshore waters. Viviparous, number of young 1 to 4, usually 2; size at birth about 31 to 40 cm.

Presumably eats small fishes and vertebrates; harmless to people.

## PRESENT FISHING GROUNDS:

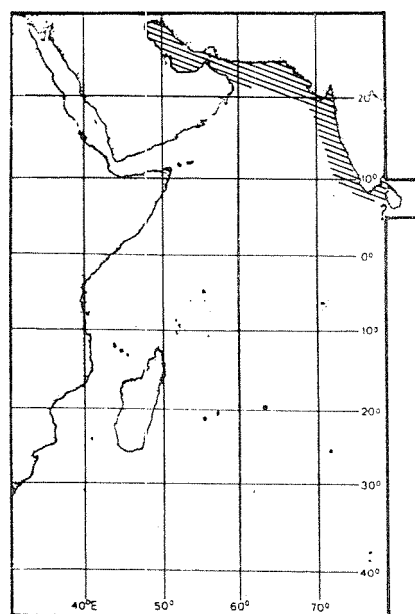
Inshore and offshore (India, Pakistan).

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

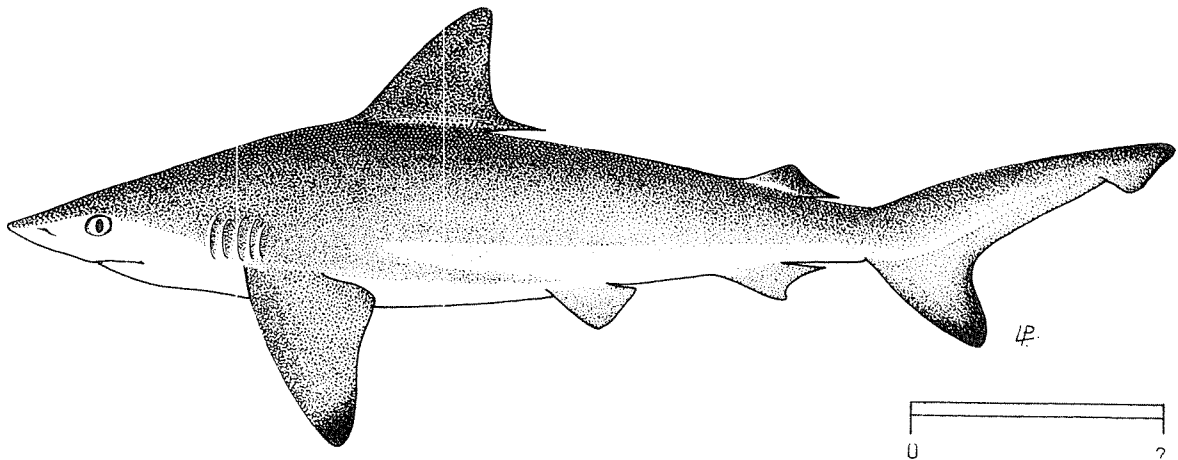
Caught with drifting gillnets and longlines.

Utilized fresh for human consumption (India), very common in catches.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus hemiodon (Valenciennes, in Müller & Henle, 1839)OTHER SCIENTIFIC NAMES STILL IN USE : Hypoprion hemiodon (Valenciennes, in Müller & Henle, 1839)

## VERNACULAR NAMES:

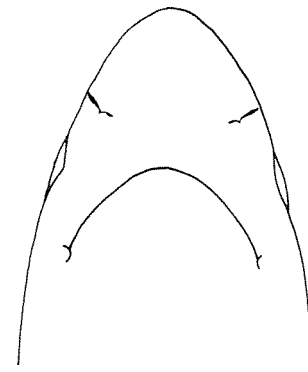
FAO: En - Pondicherry shark  
Fr - Requin baliai  
Sp - Tiburón de Pondicherry

NATIONAL:

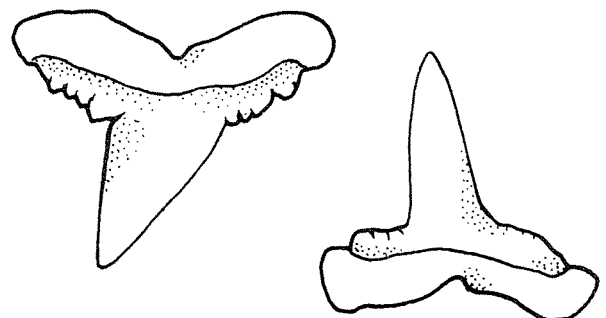
## DISTINCTIVE CHARACTERS:

A small (maximum size unknown) shark. Body rather stout. Snout moderately pointed and parabolic, its length equal to or slightly less than mouth width and greater than internasal space; labial furrows short; anterior nasal flaps with a short, slender, narrow lobe; upper teeth with oblique or semioblique, narrow, unserrated or weakly serrated cusps and strong distal cusplets; lowers with erect cusps, no cusplets and smooth edges; gill slits relatively short. First dorsal fin with a narrowly rounded apex, its origin just posterior to pectoral fin base insertions and over pectoral inner margins, its inner margin and free rear tip rather long; second dorsal fin moderately high, its inner margin attenuated and elongated but less than twice the height of the fin, its origin slightly behind that of anal fin; pectoral fins weakly falcate and with narrowly rounded tips. A dermal ridge present between dorsal and fin bases.

Colour: grey above, white below, with the tips of the pectorals, and upper and lower caudal fin lobes black; other fins dusky.



underside of head

upper tooth and lower tooth  
near centre

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Carcharhinus sorrah: cusps of upper teeth strongly serrated, second dorsal fin lower, with its inner margin twice the height of fin or more; a prominent black spot on second dorsal fin, in addition to the prominent black tip on lower caudal fin lobe.

C. limbatus, C. brevipinna and C. amblyrhynchoides: upper teeth with erect or nearly erect narrow cusps, usually with well-developed serrations (except in young of C. brevipinna), longer gill openings, less attenuated free rear tips of first and second dorsal fins and no interdorsal ridge. Furthermore, C. brevipinna and C. limbatus have more pointed snouts (especially C. brevipinna, C. brevipinna is more slender and has longer upper labial furrows, and C. amblyrhynchoides is somewhat stockier and has a shorter, obtusely wedge-shaped snout.

C. macloti: body slender, very long, more pointed snout with a hard, hypercalcified mass inside it; inner margins of first and second dorsal fins longer; second dorsal fin very low, with inner margin at least twice the fin height; no prominent markings on fins, but with an inconspicuous white posterior margin on most of them; no interdorsal ridge.

C. dussumieri and C. sealei: anterior nasal flap broad, teeth more oblique in upper jaw, with serrated cusps; lower teeth oblique or semioblique, a black spot on the second dorsal fin the only conspicuous marking.

Other species of Carcharhinus: shorter, more bluntly rounded snouts, or broadly triangular upper teeth, or absence of an interdorsal ridge, or different markings or lack of conspicuous markings, or a combination of some of these characters; all with serrated cusps on upper teeth.

**SIZE:**

Maximum: uncertain, immature specimens up to 60 cm long, size at maturity unknown.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Confined to the northeastern part of the area, from the Gulf of Oman to Pakistan, India and possibly Sri Lanka. Elsewhere, known in the Eastern Indian Ocean and Western Pacific, from scattered localities eastward from India to Vietnam, the Philippine Islands, China and Indonesia. Reported to enter fresh water in India and Vietnam, but this needs confirmation.

Apparently an inshore to offshore, continental shelf species. Presumably viviparous, size at birth not reported.

Diet unknown, presumably small fishes, cephalopods and crustaceans. Not known to be dangerous to humans.

**PRESENT FISHING GROUNDS:**

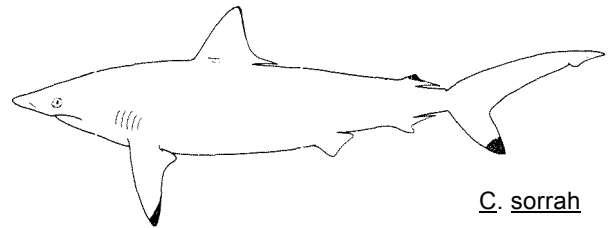
In the area, off Pakistan and India, on the continental shelf.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

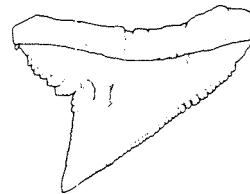
Separate statistics are not reported for this species.

Caught in bottom-set gillnets and presumably on long gear.

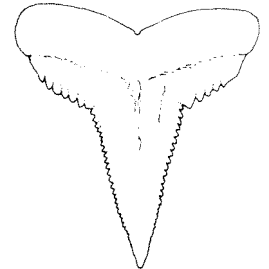
Utilized fresh for human consumption.



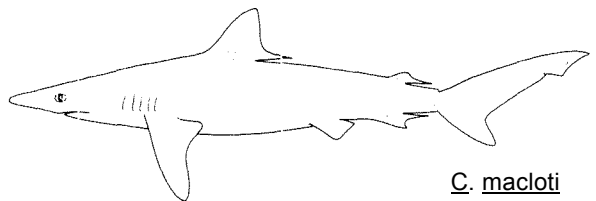
C. sorrah



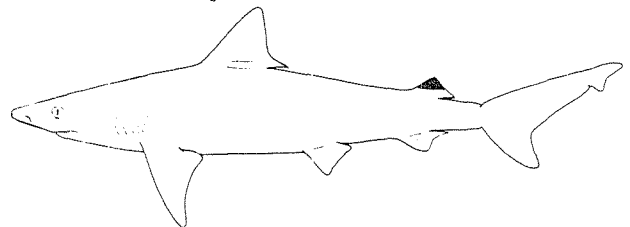
C. sorrah



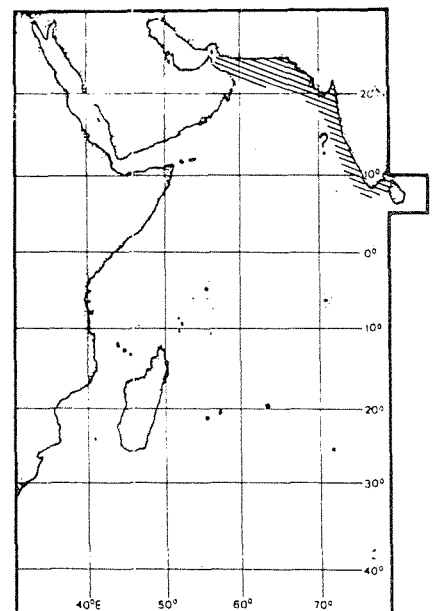
C. limbatus



C. macloti



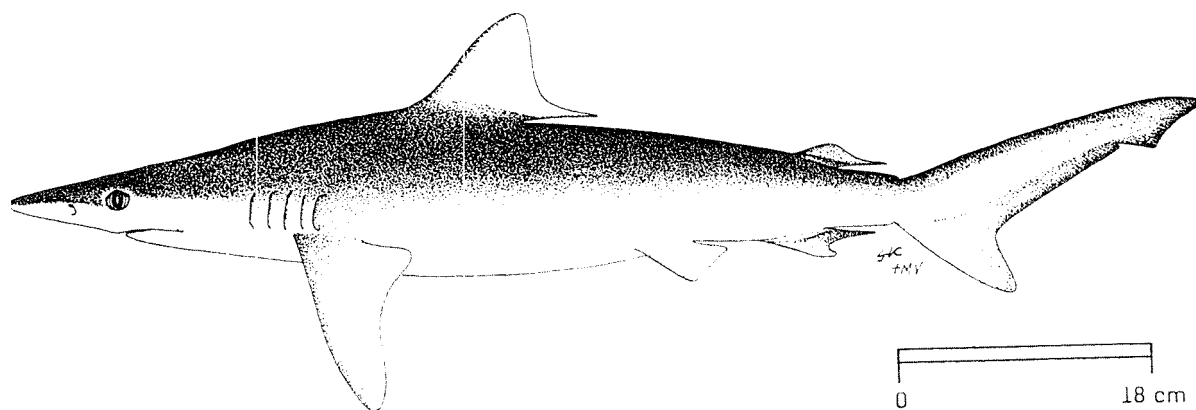
C. dussumieri





## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus macloti (Müller & Henle, 1839)OTHER SCIENTIFIC NAMES STILL IN USE: Hypoprion macloti (Müller & Henle, 1839)

## VERNACULAR NAMES:

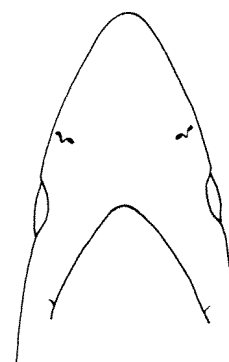
FAO :           En - Hardriose shark  
                  Fr - Requin à nez rude  
                  Sp - Tiburón trompudo

NATIONAL:

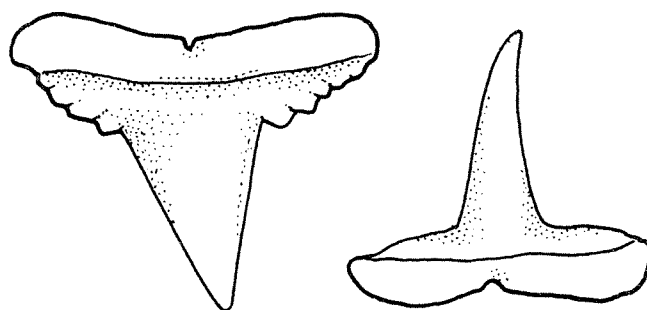
## DISTINCTIVE CHARACTERS:

A small shark. Body relatively slender. Snout very long and narrowly rounded or pointed, its length greater than mouth width and distance between nostrils; labial furrows very short; anterior nasal flaps with a slender elongated lobe; spiracles absent; teeth with smooth edges, those in upper jaw with narrow, oblique or nearly erect cusps and strong cusplets on each side of cusp; teeth in lower jaw with erect to oblique, smooth cusps and no cusplets. First dorsal fin moderately large, with a narrowly rounded or pointed apex, its inner margin greatly elongated, the free rear tip attenuated, and its origin over inner margins of pectoral fins; second dorsal fin very low, the inner margin over twice the fin height, fin origin slightly behind that of anal fin; pectoral fins relatively short, with narrowly rounded or angular tips; elongated rear tip of anal fin extending nearly to lower precaudal pit. No dermal ridge between dorsal fins.

Colour: back greyish or grey-brown, belly white. Posterior margin of pectoral fins and ventral caudal fin lobe with an inconspicuous white edge; posteroventral and dorsal margins of caudal fin with a narrow black edge.



underside of head

upper tooth           and           lower tooth  
near centre

### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Readily distinguished from all other carcharhinids in the area by the following combination of characters: small size, slender body; very long snout with a hypercalcified mass inside it (readily observed by pinching the snout), short labial furrows, smooth-edged upper teeth with prominent cusplets, extremely long inner margins and attenuated free rear tips on first dorsal, second dorsal and anal fins, with the second dorsal inner margin greater than twice the fin height; second dorsal fin origin somewhat behind anal origin but in front of anal midbase; no dermal ridge between dorsal fins, and absence of conspicuous markings.

### **SIZE:**

Maximum: below 100 cm.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, known from scattered records off Kenya and Tanzania, Pakistan, Sri Lanka and India, but probably more widely distributed. Elsewhere, from the east coast of India eastward to New Guinea, China and Taiwan Island.

A common shark of continental waters inshore and offshore. viviparous, number of embryos usually 2 (one per uterus), size at birth 45 to 50 cm.

Food habits unknown, but probably small fishes, cephalopods and crustaceans. Not known to be dangerous to humans.

### **PRESENT FISHING GROUNDS:**

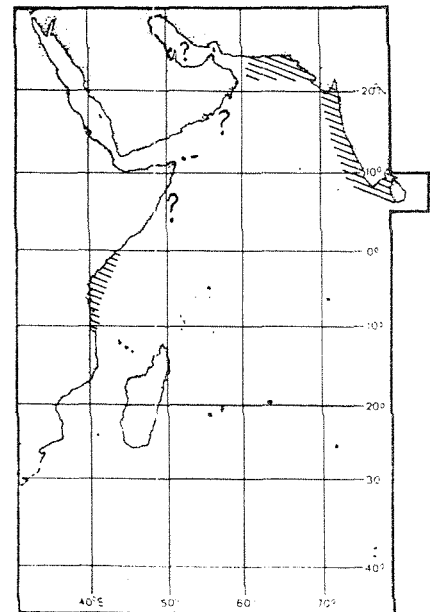
Continental waters of the area, particularly off India, Pakistan and Kenya.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

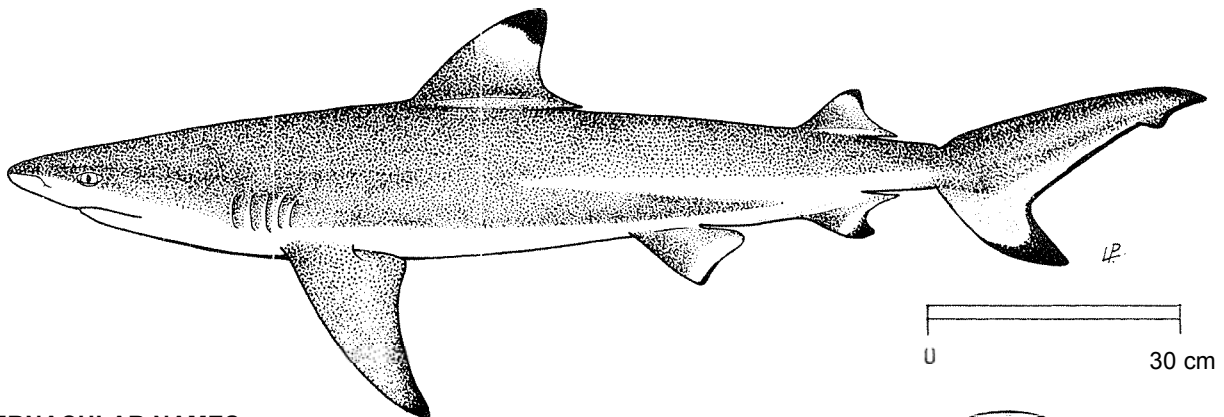
Caught with floating gillnets, also bottom gillnets and longlines.

Utilized fresh for human consumption (India).



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus melanopterus (Quoy & Gaimard, 1824)OTHER SCIENTIFIC NAMES STILL IN USE : Hypoprion playfairi (Günther, 1870)

## VERNACULAR NAMES:

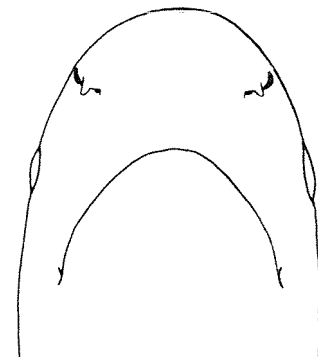
FAO : En - Blacktip reef shark  
Fr - Requin pointes noires  
Sp - Tiburón de puntas negras

NATIONAL:

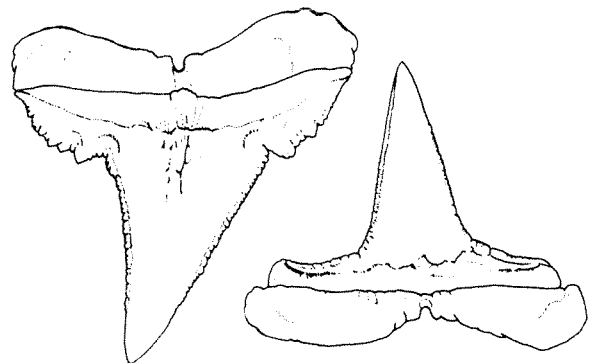
## DISTINCTIVE CHARACTERS:

A small to medium-sized shark. Body moderately stout. Snout very short and broadly rounded, its length less than mouth width and about equal to distance between nostrils; labial furrows very short; anterior nasal flaps with a stout, broad lobe; spiracles absent; teeth with serrated edges, those in upper jaw with narrow semioblique to oblique cusps and low basal cusplets; teeth in lower jaw with erect or semierect narrow cusps and serrated edges. First dorsal fin moderately large, with a narrowly rounded or pointed apex, its origin over inner margins of pectoral fins, its free rear tip short; second dorsal fin high, its inner margin much less than twice the fin height, its origin over or slightly anterior to anal origin; pectoral fins moderately long, with narrowly rounded or pointed tips; rear tip of anal fin ending well in front of lower caudal fin origin. No dermal ridge between dorsal fins.

Colour: yellow-brown on dorsal surface, underside white; all fins conspicuous with black or dark brown tips, also anterior and posterior dark edging on pectorals and upper lobe of caudal fin. A prominent black tip of first dorsal fin set off abruptly by a light band below it; a conspicuous dark band on flanks, extending rearward to pelvic fins.



underside of head



upper tooth

and lower tooth  
near centre

## **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The combination of yellow-brown colour on back, striking dark markings on fins, narrow-cusped upper teeth, short, bluntly rounded snout, large anterior nasal flaps, large high second dorsal fin, and absence of interdorsal ridge readily separates this shark from all other carcharhinids in the area.

## **SIZE:**

Maximum: less than 200 cm; most adults less than 160 cm.

## **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, wide-ranging from Tanzania and possibly South Africa to the Red Sea, Pakistan, India and Sri Lanka. Elsewhere, in the Indo-West Pacific eastward to the Hawaiian Islands; also in the eastern Mediterranean Sea as an invader from the Red Sea through the Suez Canal.

A common inshore and sometimes offshore shark, on continental and insular shelves; prefers shallow water on and around coral reefs. May occur in brackish and even fresh water, but does not occur in tropical lakes and rivers far from the sea. Viviparous, number of young 2 to 4 (commonly 4). Size at birth between 33 to 50 cm.

A bottom and midwater feeding shark that eats small bony fishes (including mullets), octopi and small sharks. It has been definitely recorded as having attacked humans without provocation, but it should not be regarded as particularly dangerous because of its small size and usually timid behaviour when confronted by people. May be aggressive when divers are spearfishing.

## **PRESENT FISHING GROUNDS:**

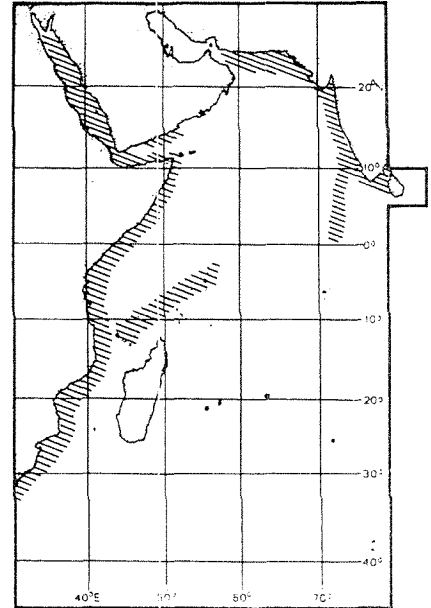
Possibly throughout the area, though data for the western part are lacking.

## **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught on longlines and in gillnets.

Utilized fresh for human consumption; fins for the oriental sharkfin trade, livers for vitamin oil, and offal for fishmeal.

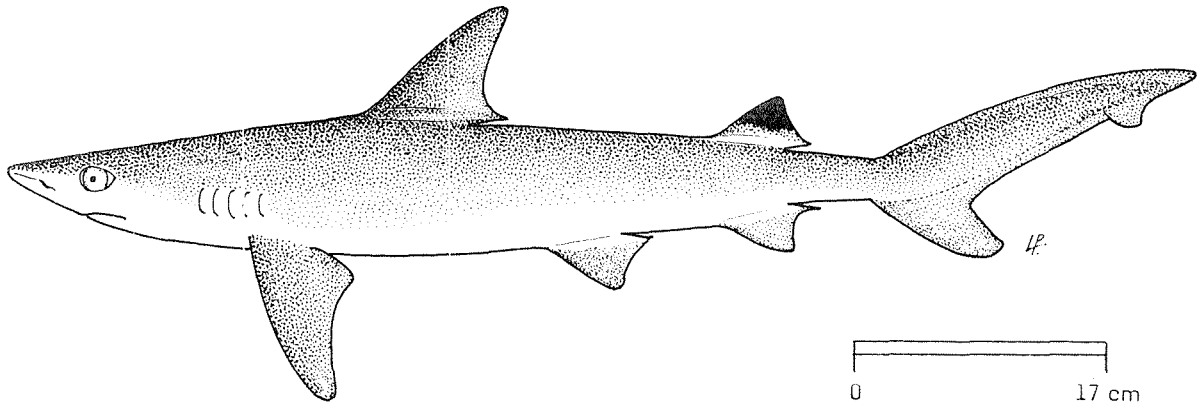


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus sealei (Pietschmann, 1916)

## OTHER SCIENTIFIC NAMES STILL IN USE:

Carcharhinus dussumieri (Valenciennes, in Müller & Henle, 1839)Carcharhinus menisorrah (Valenciennes, in Müller & Henle, 1839)

## VERNACULAR NAMES:

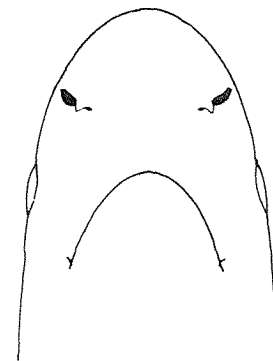
FAO : En - Blackspot shark  
Fr - Requin à tache noire  
Sp - Tiburón alinegro

NATIONAL

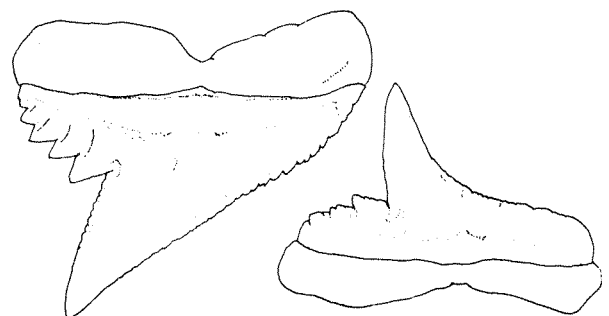
## DISTINCTIVE CHARACTERS:

A small, stout to slender-bodied shark. Snout rather long and narrowly parabolic or wedge-shaped, its length usually shorter than mouth width but: subequal to the internarial space; labial furrows very short; anterior nasal flaps expanded; spiracles absent; gill slits short; teeth with serrated edges, upper teeth with narrow-based, strongly oblique serrated cusps and strong, smooth-edged cusplets; teeth in lower jaw erect to oblique, without cusplets, serrated and narrow-cusped; first dorsal fin moderately high, with an angular apex, notched posterior margin, and short inner margin, strongly falcate; origin of first dorsal over pectoral inner margins; origin of second dorsal fin about opposite or slightly behind that of anal fin; second dorsal fin high, its inner margin less than 1.5 times the fin height and its posterior margin concave; pectoral fins short and strongly falcate, with narrow, angular apices. An interdorsal ridge present or occasionally absent on back.

Colour: back greyish or grey-brown, belly whitish. A black spot on the second dorsal fin is the only conspicuous marking.



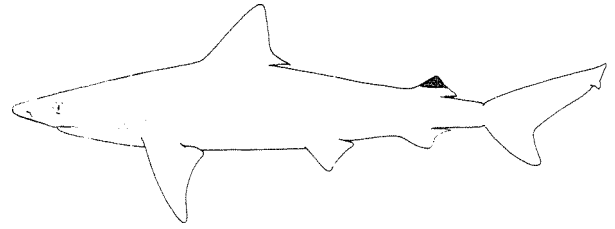
underside of head

upper tooth and lower tooth  
near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus dussumieri: snout usually broader, upper teeth with serrated cusplets, pectoral and first dorsal fins triangular and not falcate, posterior margins nearly straight.

Other species of Carcharhinus: do not have the combination of the following characters; small size, narrow to broad, parabolic snout, strongly oblique upper teeth with strong cusplets, long anterior nasal flaps, interdorsal ridge usually present, and black-tipped second dorsal fin as the only conspicuous marking.



## SIZE:

Maximum: 95 cm; maturing at 65 to 75 cm, at least 87 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, known from South Africa northward to Kenya, Madagascar, the Seychelles, possibly Mauritius, and the southwest coast of India. Elsewhere, from the Eastern Indian Ocean and Western Pacific eastward to Vietnam, Australia and the Philippine Islands.

A common coastal, mostly inshore species, from close inshore at a few metres to at least 40 m depth; sometimes wandering offshore. Viviparous, number of young 1 or 2; size at birth 33 to 45 cm.

Feeds on small fish, prawns and squid. Not known to be dangerous to people.

## PRESENT FISHING GROUNDS:

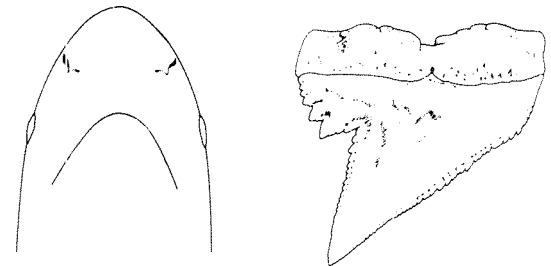
Uncertain.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Meth of fishing and utilization uncertain.

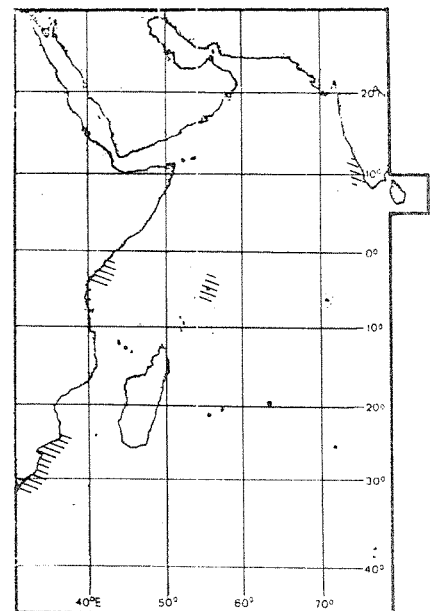
Commonly taken with rod and reel by sports anglers in South Africa.



underside of head

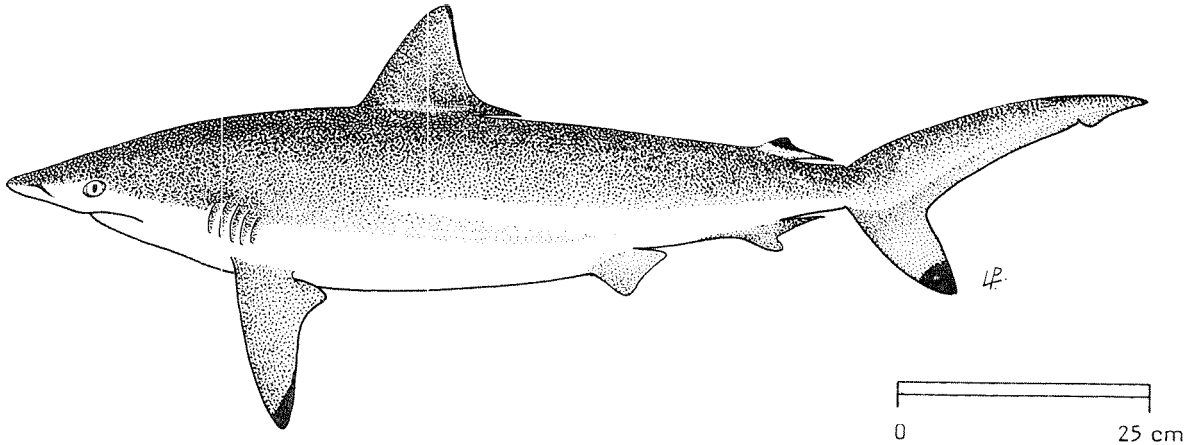
upper tooth

C. dussumieri



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus sorrah (Valenciennes, in Müller & Henle, 1839)OTHER SCIENTIFIC NAMES STILL IN USE: Carcharhinus bleekeri (Dumeril, 1865)

## VERNACULAR NAMES:

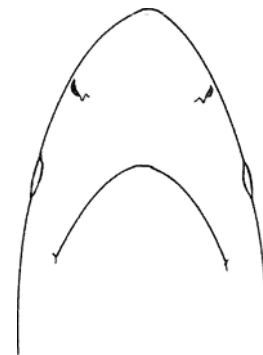
FAO :           En - Spottail shark  
                  Fr - Requin tacheté  
                  Sp - Tiburón rabo manchado

NATIONAL:

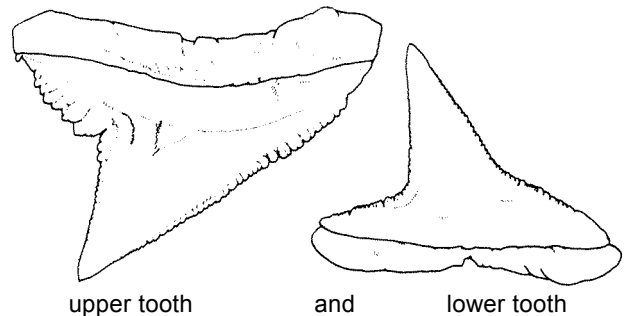
## DISTINCTIVE CHARACTERS:

A small to medium-sized shark. Body slender to moderately stout. Snout moderately pointed, parabolic, and long, its length equal to or slightly less than mouth width and greater than internasal space; labial furrows short; anterior nasal flaps with a short, slender, narrow lobe; upper teeth with oblique or semioblique, narrow, serrated cusps and strong distal cusplets; lowers with semierect or oblique serrated cusps and no cusplets; gill slits relatively short. First dorsal fin with a narrowly rounded apex, its origin usually over the pectoral inner margins, its inner margin and free rear tip moderately long; second dorsal fin low, with a long, attenuated free rear tip and inner margin over twice fin height; origin of second dorsal fin over or slightly behind origin of anal fin; pectoral fins weakly falcate and with narrowly rounded tips. A dermal ridge present between dorsal fin bases.

Colour: grey or grey-brown above, white on belly, with a golden-brown sheen on the area between eyes and gill slits in fresh specimens; pectorals, second dorsal fin, and lower caudal fin lobe with conspicuous black tips, first dorsal and upper caudal fin lobe with black edging. A dark band on flank extending rearwards to pelvic fins.



underside of head



upper tooth

and

lower tooth

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus hemiodon: cusps of upper teeth not serrated or weakly serrated; second dorsal fin higher, inner margin less than twice the fin height; tip of second dorsal fin dusky, not conspicuously black.

Carcharhinus limbatus, C. brevipinna and C. amblyrhynchoides: upper teeth with erect or nearly erect narrow cusps and no cusplets, upper anteriolateral teeth more numerous, in 15 or more rows on each side (commonly 12 in C. sorrah); longer gill openings, higher second dorsal fins, with less attenuated free rear tips, and no interdorsal ridge.

Carcharhinus macloti: body more slender, very long; snout more pointed with a hard hypercalcified mass inside it; inner margin of first dorsal fin longer; cusps and bases of upper teeth smooth-edged; no prominent markings on fins, and no interdorsal ridge.

Carcharhinus dussumieri and C. sealei: anterior nasal flaps broad, teeth more oblique in upper jaw; a black spot on the second dorsal fin the only conspicuous markings.

Other species of Carcharhinus in the area: shorter, more bluntly rounded snouts, or broadly triangular upper teeth, or absence of an interdorsal ridge, or different markings or lack of conspicuous markings, or combinations of some or all of these characters.

### SIZE:

Maximum: about 150 to 160 cm, possibly to 230 cm but this is dubious; adults commonly 106 to 150 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, wide-ranging from Madagascar, possibly South Africa, the Mauritius-Seychelles area, and the Red Sea eastward to Pakistan, western and south-eastern India, and probably Sri Lanka. A Indo-West Pacific species, ranging eastward from the area to China, the Philippine Islands, Indonesia, Australia and Vanikoro Island, but without a wide distribution in Oceania.

A common inshore and sometimes offshore shark, on continental and insular shelves from close inshore and the surface down to at least 140 m depth. Often on and around coral reefs, but apparently occurring on other bottom habitats. Viviparous, number of young 2 to 6. Size at birth about 50 to 60 cm.

Feeds on small bony fishes (including serranids and scombrids) and octopi. Not known to have attacked people, and probably not particularly dangerous because of its small size.

### PRESENT FISHING GROUNDS:

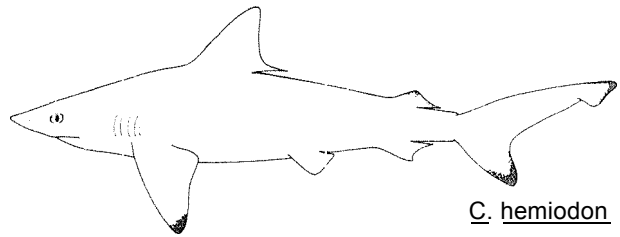
Known from Pakistan, India and possibly Sri Lanka, but probably elsewhere in the area.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

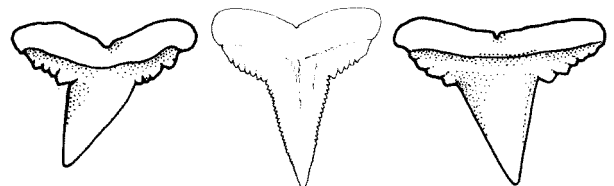
Separate statistics are not reported for this species.

Caught in floating gillnets and on longlines.

Utilized fresh for human consumption; fins of large individuals may be used in the oriental sharkfin trade, livers for vitamin oil, and offal for fishmeal.



C. hemiodon

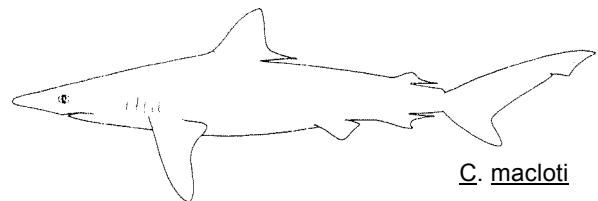


C. hemiodon

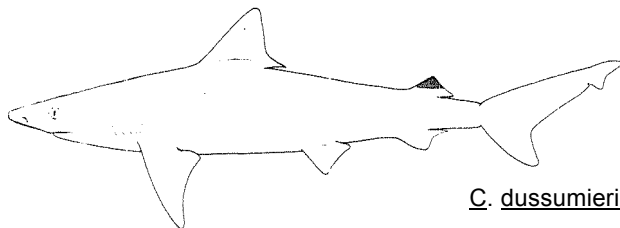
C. limbatus

C. macloti

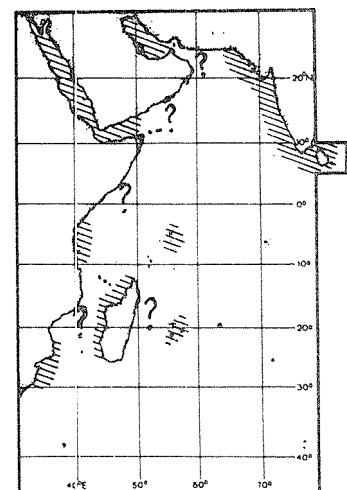
upper tooth



C. macloti



C. dussumieri



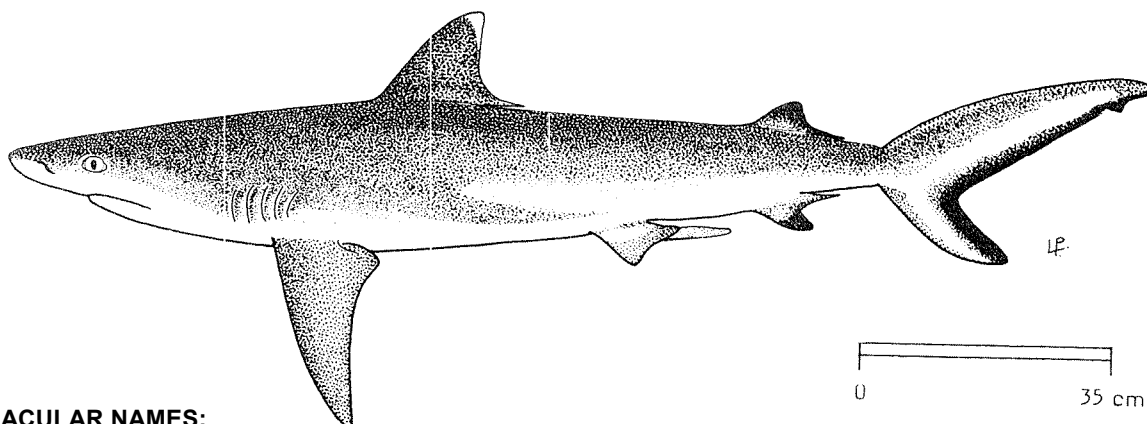


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharhinus wheeleri Garrick, 1982

## OTHER SCIENTIFIC NAMES STILL IN USE :

Carcharhinus amblyrhynchos (Bleeker, 1856)Carcharhinus spallanzani (Peron & Lesueur, in Lesueur, 1822)

## VERNACULAR NAMES:

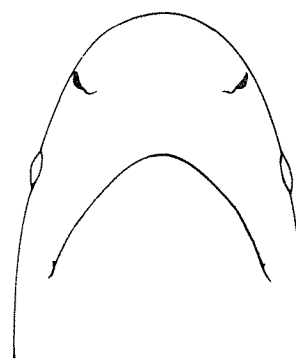
FAO : En - Blacktail reef shark  
Fr - Requin à queue noire  
Sp - Tiburón coralero rabinegro

NATIONAL:

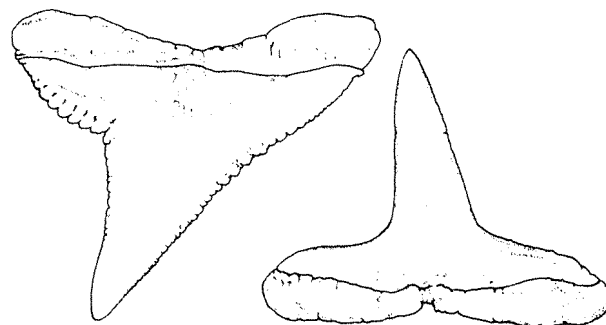
## DISTINCTIVE CHARACTERS:

A medium-sized shark. Body rather stout. Snout broadly rounded, its length equal to or (usually) less than mouth width, equal or usually greater than internasal space; labial furrows very short; anterior nasal flaps very low; no spiracles; teeth with serrated edges but with cusplets low or absent on upper teeth, always absent on lowers; upper teeth narrowly triangular, high, moderately narrow and erect-cusped in front of mouth, progressively oblique posteriorly; teeth in lower jaw mostly erect and narrow-cusped. First dorsal fin moderately high and with a pointed or narrowly rounded apex, its origin over pectoral inner margins; origin of second dorsal about opposite anal fin origin or slightly in front of it; second dorsal fin moderately high, its inner margin less than 1.5 times the fin height and its posterior margin strongly concave; pectoral fins long and not strongly falcate, with narrow, angular apices. Usually no ridge between dorsal fins, or occasionally a weak one.

Colour: dark grey or bronzy above, white below. First dorsal fin with a white tip and posteriodorsal margin, second dorsal and anal fins dusky or black-tipped, caudal fin with a conspicuous broad black posterior margin, other fins not conspicuously marked on dorsal surface but pectoral fins with black tip and a broad posterior marginal band on ventral surface.



underside of head

upper tooth and lower tooth  
near centre

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus amblyrhynchos: very similar to C. wheeleri, and possibly not distinct. Usually without a white-tipped first dorsal fin; also a slightly longer snout (5.8 to 8.7 percent of total length, versus 6.4 to 7.9 percent of total length in C. wheeleri).

Other species of Carcharhinus: no other species in the area have the combination of the following characters: body moderately stout; snout moderately short but broadly rounded, teeth serrated, narrow-cusped, partially oblique, dorsal fins high, pectoral fins straight; usually no interdorsal ridge, a broad black caudal fin margin and a white-tipped first dorsal fin as the only conspicuous markings.

## SIZE:

Maximum: about 172 cm, possibly to 193 cm; adults maturing between 110 and 120 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Confined to the western part of the area (as presently known) ranging from South Africa and southern Mozambique up to Kenya and Zanzibar, western Madagascar, Mauritius and the Seychelles Islands, St. Brandon reef, the Gulf of Aden, and the Red Sea.

An inshore to offshore shark associated with coral reefs, occurring from the intertidal zone and surface down to at least 140 m. Viviparous, number of young 1 to 4 per litter: size at birth 65 to 75 cm.

Feeds on surface and bottom reef bony fishes, as well as squids and octopi. Not involved in attacks on people but can be aggressive when divers spear fish; apparently not as aggressive as the closely related grey reef shark, C. amblyrhynchos, but regarded as potentially dangerous to people.

## PRESENT FISHING GROUNDS:

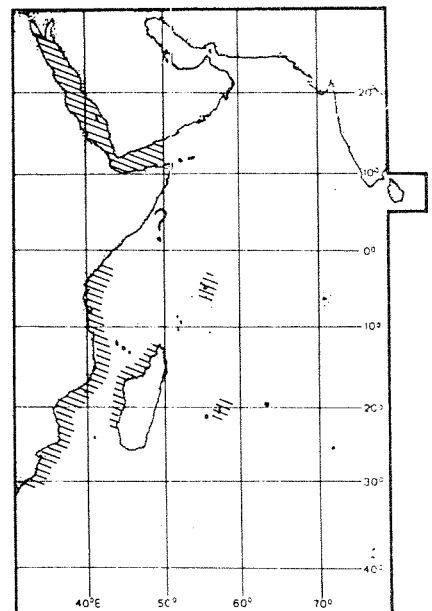
Probably off western Madagascar, Kenya and Tanzania and in the Mauritius-Seychelles area as well as the Red Sea.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Probably caught on line gear and with gillnets.

Probably utilized fresh and dried-salted for human consumption; other uses possible.

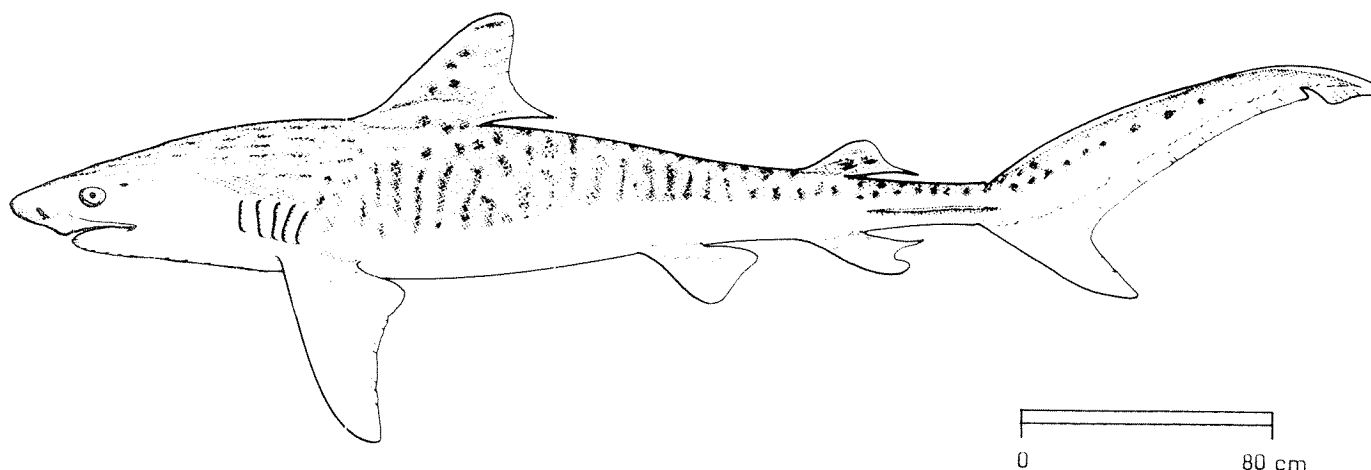


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Galeocerdo cuvieri (Peron & LeSueur, in LeSueur, 1822)

OTHER SCIENTIFIC NAMES STILL IN USE :

Galeocerdo arcticus (Faber, 1829)Galeocerdo rayneri McDonald & Barron, 1868

## VERNACULAR NAMES:

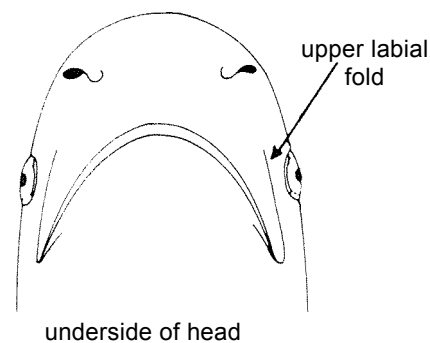
FAO: En - Tiger shark  
Fr - Requin tigre commun (= Requin tigre, Area 31)  
Sp - Tintorera

NATIONAL:

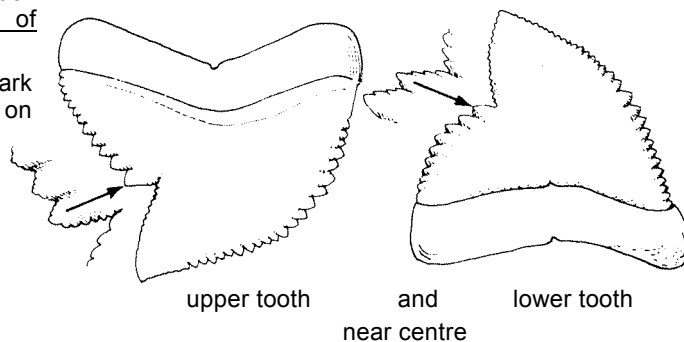
## DISTINCTIVE CHARACTERS:

A large fusiform shark. Snout very short and bluntly rounded, its length much less than width of mouth; spiracles small, slitlike, but easily visible; upper labial folds about as long as snout, reaching to front of eyes; teeth coarsely serrated, their outer edges deeply notched and the tips directed obliquely outward, their inner edges broadly convex; second dorsal fin much smaller than first. A low rounded keel on each side of caudal peduncle.

Colour: back dark grey or greyish brown with dark brown or black rectangular spots often forming bars on sides and fins, but fading with growth.



underside of head

upper tooth and lower tooth  
near centre

## **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The combination of characters such as the very short snout, the small spiracles, the long upper labial folds and the peculiar shape of the teeth readily distinguishes this species from other carcharhinid sharks occurring in the area.

## **SIZE:**

Maximum: at least 650 cm, possibly 740 cm; common to 400 cm.

## **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, it occurs from South Africa, Madagascar and the Red Sea to India and Sri Lanka; also the Seychelles, St. Brandon, Mauritius, Tromelin. and Europa Island. Elsewhere, wide-ranging in the Indian, Pacific and Atlantic Oceans, primarily in the tropics but occasionally penetrating temperate waters.

Inhabits coastal, as well as offshore waters, near the surface and bottom; often found in shallow waters close inshore, including river estuaries. Ovoviviparous and very prolific with 10 to 82 young in a litter. Size at birth between 60 and 1.04 cm.

A voracious, indiscriminate predator feeding on all kinds of fish (including other sharks and rays), marine mammals, turtles, seabirds, sea snakes, squids, conchs and crabs. Often swallows a variety of indigestible and non-nutritive items, and readily feeds on carrion. Considered among the most dangerous of sharks because of its shallow-water habitat, large jaws and teeth, indiscriminate appetite, and large size; several attacks on people have been recorded for this species.

## **PRESENT FISHING GROUNDS:**

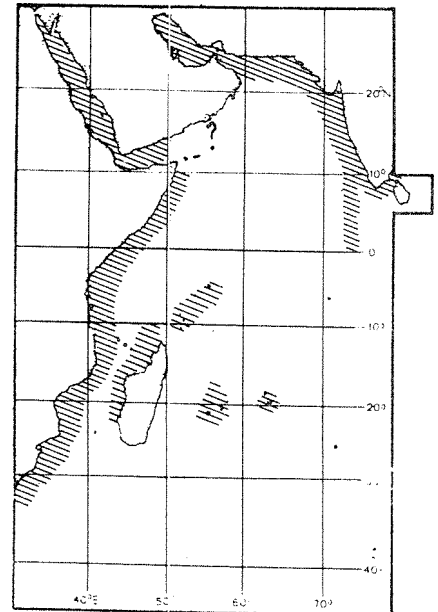
Probably throughout the area, but definitely off Madagascar, in the Red Sea, and off Pakistan, India and probably Sri Lanka.

## **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in floating and bottom gillnets and with line gear (including pelagic longlines).

Utilized fresh and dried-salted for human consumption, livers processed for vitamin oil, and offal for fishmeal.

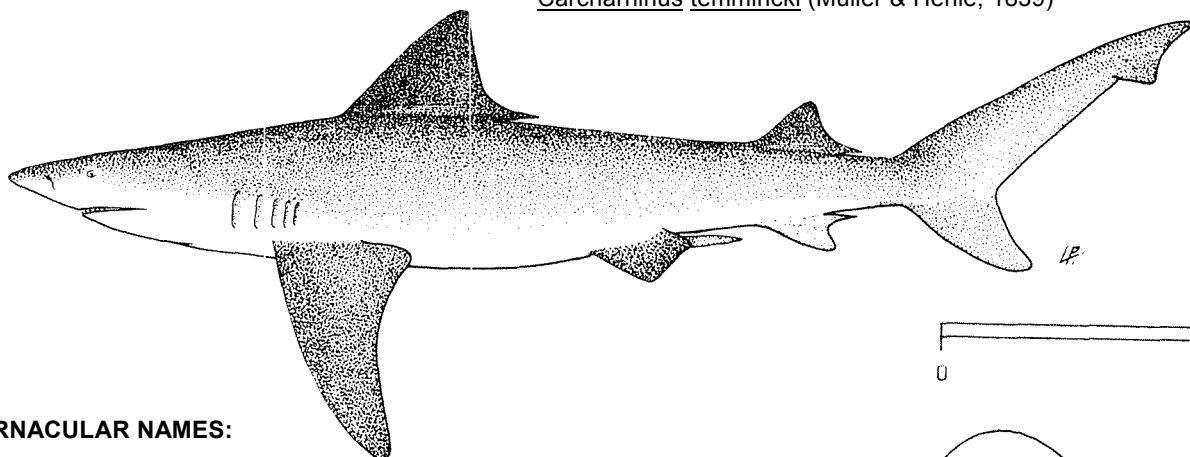


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Glyphis gangeticus (Müller & Henle, 1839)

## OTHER SCIENTIFIC NAMES STILL IN USE:

Carcharhinus gangeticus (Müller & Henle, 1839)Carcharhinus temmincki (Müller & Henle, 1839)

## VERNACULAR NAMES:

FAO : En - Ganges shark  
Fr - Requin du Gange  
Sp - Tiburón del Ganges

NATIONAL:

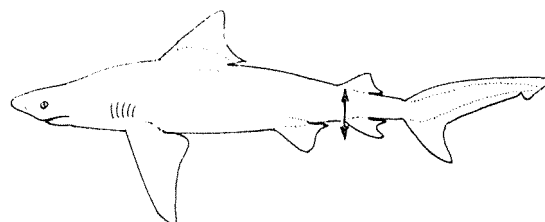
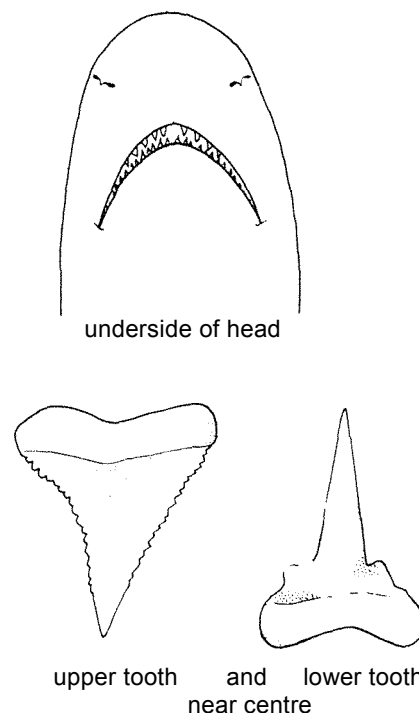
## DISTINCTIVE CHARACTERS:

A medium-sized to possibly large shark. Body moderately stout. Snout short, its length about equal to distance between nostrils and less than mouth width, labial furrows short; eyes very small; spiracles absent; nostrils with a low narrowly triangular anterior nasal flap; teeth in upper jaw triangular, with broad, high, serrated cusps, their outer edges nearly straight to concave but not notched; cusps of lower teeth narrow, tall, erect, and strongly hooked, conspicuously protruding when mouth is closed, with smooth edges, weak cusplets present on the first few anteriormost lower teeth, and strong arched bases. First dorsal fin high, with a pointed or slightly rounded apex, its origin a little in advance of pectoral fin insertions; second dorsal fin very high, about half the height of first dorsal, with its inner margin less than the fin height, its posterior margin moderately concave, and its origin slightly in front of anal fin; pectoral fins large, broad, falcate, with narrow, pointed or rounded tips. Upper precaudal pit in the form of a shallow longitudinal depression on the dorsal surface of the caudal peduncle. No dermal ridge between dorsal fins.

Colour: light brownish or grey-brown above, light below; apparently no conspicuous markings.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus leucas: this species has often been confused with Glyphis gangeticus, and the range of the latter is uncertain due to many records of G. gangeticus being based on C. leucas. However, C. leucas is easily distinguished by its broader snout, larger eyes, lower, broader upper teeth and coarsely serrated, lower crowned, heavy and fairly straight-cusped lower teeth which do not conspicuously protrude when the mouth is closed, the absence of cusplets on the anteriormost lower teeth, lower second dorsal fin, less than half the height of first, possibly less falcate pectoral fins, and transverse, crescentic precaudal pits.

C. leucas

Carcharhinus amboinensis: snout broader, eyes larger, upper teeth lower, broader, lower teeth low-crowned, coarsely serrated, and with heavy, straight cusps that do not conspicuously protrude when the mouth is closed, no cusplets on the anteriormost lower teeth, second dorsal fin much lower, less than 1/3 the height of first, possibly less falcate pectoral fins, and transverse, crescentic precaudal pits.

Lamiopsis temmincki: sometimes confused with G. gangeticus, and rather similar in its small eyes, teeth and fossate precaudal pits, but differing in having the second dorsal fin about as large as the first, a longer, more parabolic snout, the pectoral fins broader and not falcate, the first dorsal fin origin more posterior, behind the pectoral fin bases, the pelvic fins larger, with their anterior margins about half as long as the pectoral anterior margins (somewhat less than half in G. gangeticus), the posterior margin of anal fin with a shallow notch (deep in G. gangeticus), and no cusplets on the first few anterior lower teeth.

Other species of Carcharhinus: upper teeth with narrow cusps, or, when broadly triangular, an interdorsal ridge is present; precaudal pits transverse and crescentic.

**SIZE:**

Maximum: uncertain, adult males at least 168 cm, females probably over 2 m.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

As presently known from the area, probably occurring off Pakistan and possibly in the "Gulf", but other records are uncertain due to confusion with C. leucas and other species. Elsewhere, known for certain from the Ganges and Hooghly River system, and presumably adjacent marine waters; but reported without adequate documentation in the literature as being wide-ranging, from the Red Sea and East Africa to Japan and Fiji. Specimens of this shark are rare in collections (about 4 known); if this species is encountered by fisheries workers, its characters should be carefully noted and specimens, when possible, sent to appropriate institutions with fish collections.

An inshore continental species, apparently known from marine estuarine habitats but famed for its occurrence in the Ganges-Hooghly River system. If the species is more wide-ranging in the area and elsewhere in the continental Indo-West Pacific, it may ascend other rivers. Viviparous, size at birth probably about 60 cm, judging from a newborn specimen (with a prominent umbilical scar) 61 cm long.

The diet of this shark is unknown, but its large jaws and teeth suggest relatively large prey such as large bony fishes, other sharks, and possibly marine and riverine mammals. The species is reputed to be dangerous to people in the Ganges River, but at least some of the attacks ascribed to the Ganges shark may have been caused by C. leucas (a known dangerous species that is found in the Hooghly River and probably also occurs in the Ganges).

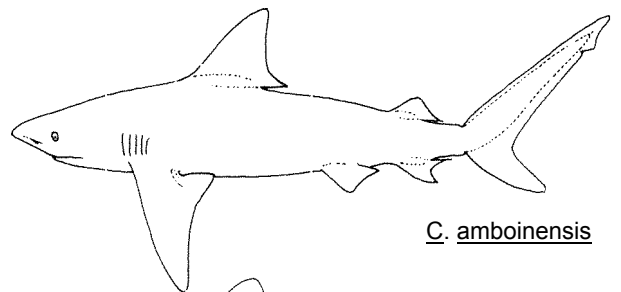
**PRESENT FISHING GROUNDS:**

In the area, uncertain.

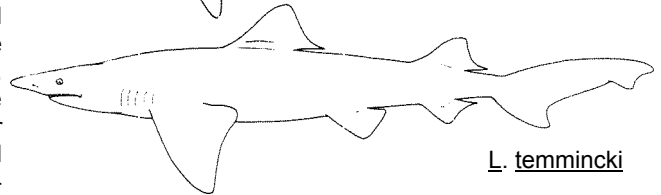
**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species, except some pelagic fisheries catch data (USSR) under its name, which cannot be confirmed.

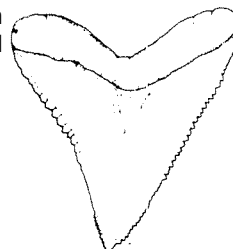
Gear and forms of utilization uncertain at present; possibly used for food and liver oil.



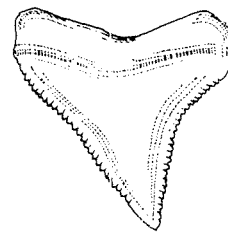
C. amboinensis



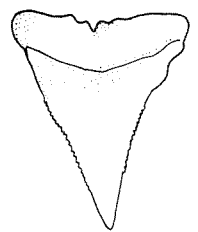
L. temmincki



C. leucas

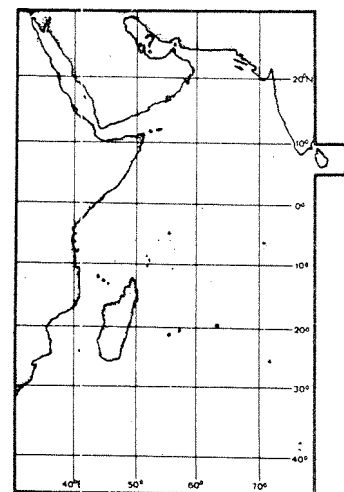


C. amboinensis



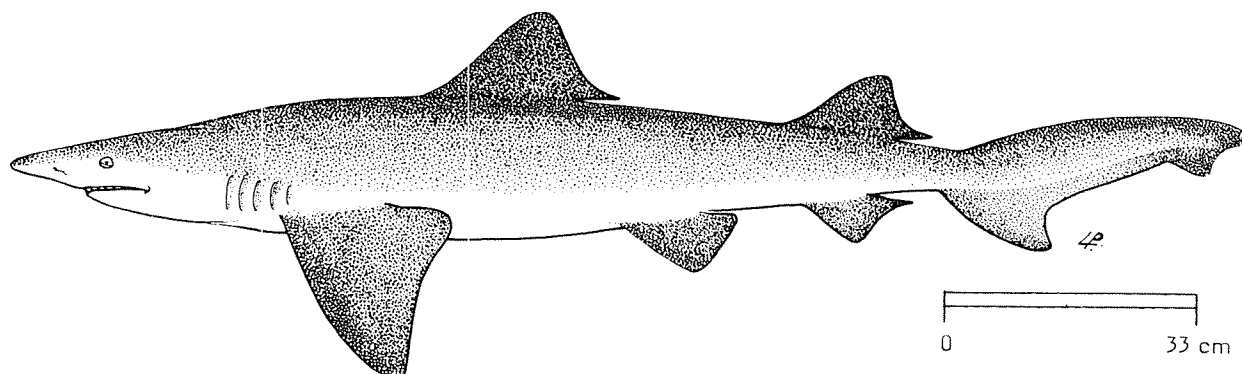
L. temmincki

upper tooth



## FAO SPECIES IDENTIFICATION SHEETS

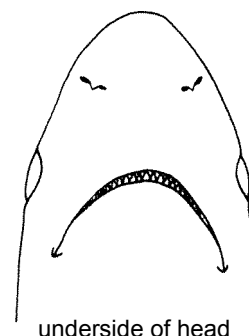
FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Lamiopsis temmincki (Müller & Henle, 1839)OTHER SCIENTIFIC NAMES STILL IN USE : Carcharhinus or Eulamia temmincki (Müller & Henle, 1839)

## VERNACULAR NAMES:

FAO :           En - Broadfin shark  
                  Fr - Requin grandes ailes  
                  Sp - Tiburón aletón

NATIONAL:

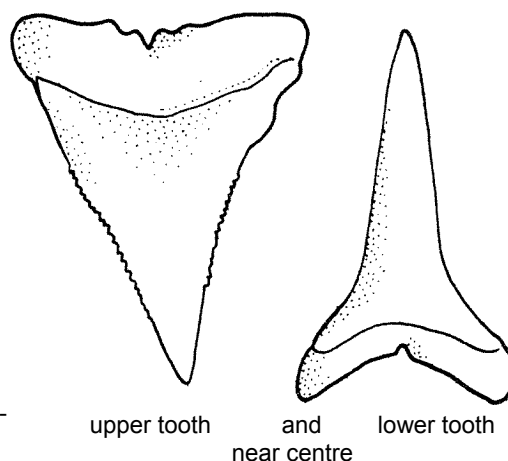


underside of head

## DISTINCTIVE CHARACTERS:

A small to medium-sized shark. Body moderately stout. Snout moderately long, parabolic in shape, its length about equal to mouth width and greater than distance between nostrils; labial furrows short; anterior nasal flaps with a short, broad lobe; spiracles absent; teeth in upper jaw with high, broadly triangular, erect to semioblique, serrated cusps and no cusplets; teeth in lower jaw with erect, high, hooked, smooth-edged narrow cusps and no cusplets. First dorsal fin moderately large, with a narrowly rounded apex, its origin over inner margins of pectoral fins, its free rear tip moderately long; second dorsal fin very large, nearly or quite as large as first dorsal, its inner margin shorter than fin height, its origin anterior to anal fin origin; pectoral fins moderately long, basally very broad and not falcate, with narrowly rounded tips; anal fin with posterior margin slightly concave; upper precaudal pit a shallow longitudinal depression, not transverse and crescentic, No dermal ridge between dorsal fins, and no keels on caudal peduncle.

Colour: grey or yellow-grey above, lighter below; no conspicuous markings.



upper tooth

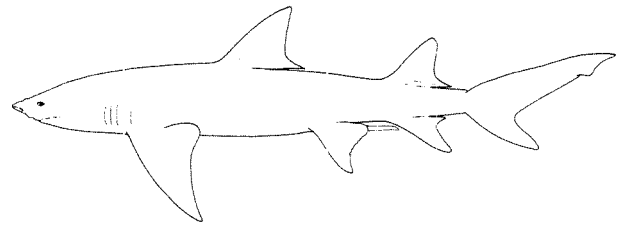
and  
near centre

lower tooth

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Negaprion acutidens: snout shorter, its length less than mouth width, and broadly rounded or obtusely wedge-shaped; upper and lower teeth with narrow, smooth-edged, high, erect or semioblique cusps, bases of upper teeth weakly serrated or smooth; dorsal and pelvic fins falcate (not falcate in Lamiopsis temmincki); pectoral fins narrower and more falcate, and anal fin with a deeply notched posterior margin.

The combination of characters such as the moderately long snout, broadly triangular serrated upper teeth and narrow, hooked lower teeth, nearly or quite equal-sized dorsal fins, broad pectoral fins, anal fin with slightly concave posterior margin and non-crescentic precaudal pits readily distinguishes this species from other carcharhinid sharks occurring in the area.



underside of head

upper tooth

Negaprion acutidens

## SIZE:

Maximum: 168 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, occurs off Pakistan and western India. Elsewhere, in the Indo-West Pacific from scattered localities, off eastern India, Burma, Makassar Straits, Borneo and China.

A little-known coastal, inshore, tropical shark, apparently rare outside the Indian waters. Viviparous.

Not known to be dangerous to people.

## PRESENT FISHING GROUNDS:

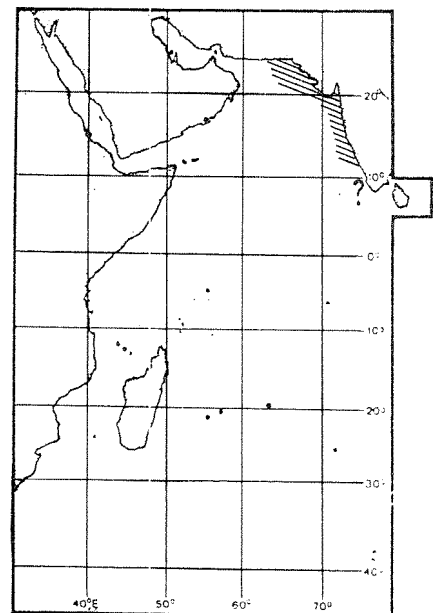
Off Pakistan and India, in inshore waters.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught in bottom and floating gillnets and with line gear.

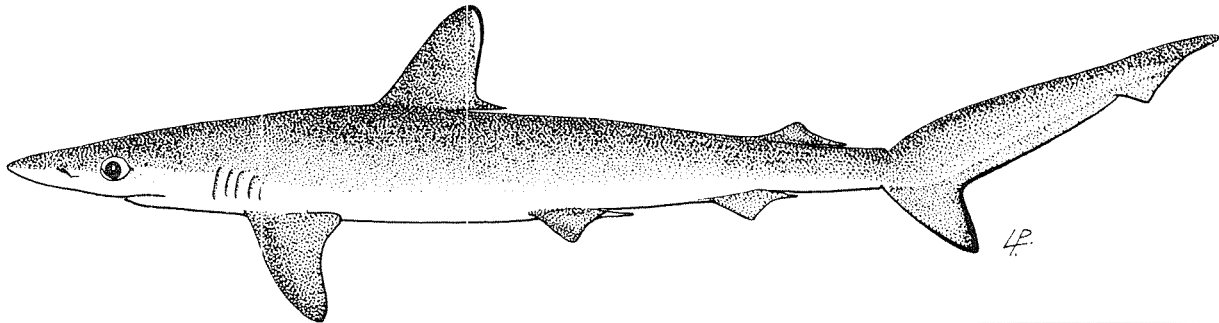
Utilized fresh for human consumption; livers used for vitamin oil.





## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Loxodon macrorhinus Müller & Henle, 1839OTHER SCIENTIFIC NAMES STILL IN USE: Scoliodon acutus (Rüppell, 1837)  
Scoliodon ceylonensis Setna & Sarangdhar, 1946

## VERNACULAR NAMES:

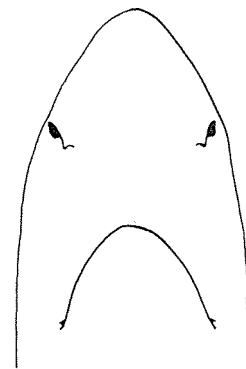
FAO : En - Sliteye shark  
Fr - Requin sagrin  
Sp - Tiburón ojuelo

NATIONAL:

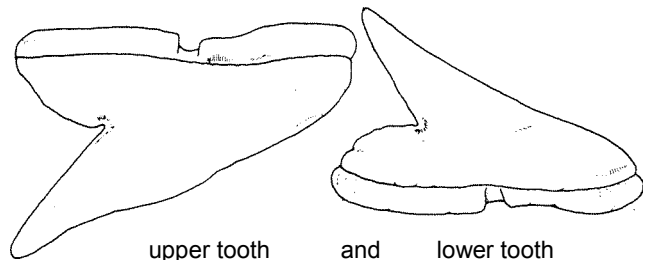
## DISTINCTIVE CHARACTERS:

A small, very slender shark. Snout very long, parabolic in shape, its length greater than mouth width and distance between nostrils; labial furrows very short; anterior nasal flaps with a short, broadly triangular lobe; eyes large, with a posterior notch; spiracles absent; teeth in both jaws with low, narrow, oblique, smooth-edged cusps and no cusplets. First dorsal fin small, its origin behind free rear tips of pectoral fins by a distance greater than length of 4th gill opening, its base 2 or 3 times in distance between pectoral and pelvic fin bases, its free rear tip moderately long and not reaching backward to pelvic fin origins; second dorsal fin very small, its height less than a third of that of first dorsal, the inner margin elongated and over twice the fin height and the fin origin usually just behind anal fin insertion (occasionally over or slightly in front of it, but far behind anal midbase); pectoral fins small, narrow and slightly falcate; anal fin with a slightly concave posterior margin and long preanal ridges. Upper precaudal pit transverse and crescentic; no keels on caudal peduncle; interdorsal ridge usually absent.

Colour: grey above, pale below, fins with pale edges (transparent in life), caudal and first dorsal fins with a narrow dark margin, first dorsal also with a dusky tip.

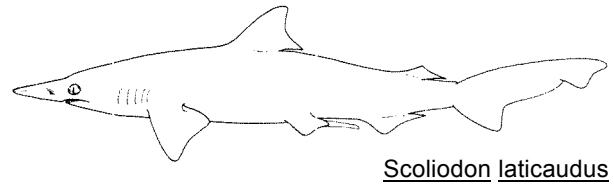


underside of head

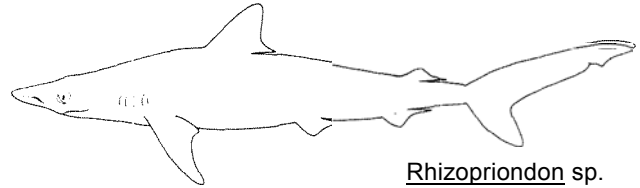
upper tooth and lower tooth  
near centre

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

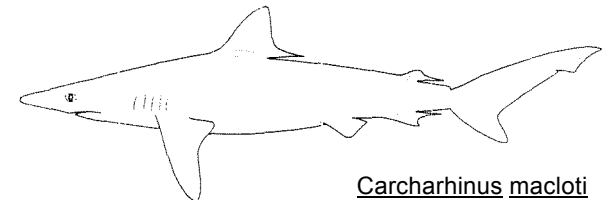
Scoliodon laticaudus: head and snout broader and more flattened; body stouter; eyes unnotched; first dorsal fin larger, its base less than 2 times in distance between pectoral and pelvic fin bases, its free rear tip usually reaching to pelvic midbases; pectoral fins broadly triangular, and caudal fin not deeply notched on its postero-ventral margin.



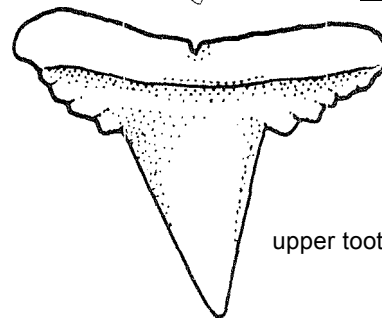
Rhizoprionodon species: body usually stouter: eyes without notches; origin of first dorsal fin over pectoral inner margins or just behind free rear tips by a distance much less than length of 4th gill opening; first dorsal fin base usually less than 2 times in distance between pectoral and pelvic fin bases; labial furrows more elongated (especially in R. acutus).



Carcharhinus macloti: eyes without notches; teeth with more erect cusps, upper teeth with strong cusplets; first dorsal fin larger, its base less than 2 times in distance between pectoral pelvic fin bases, the free rear tip longer, and the origin over pectoral inner margins; second dorsal fin origin posterior to anal fin origin but in front of anal midbase; anal fin with very short preanal ridges and with a deeply notched posterior margin.



The combination of characters including small size, long snout, slender body, eyes notches, oblique-cusped, smooth-edged teeth without cusplets, small, low second dorsal fin with origin far posterior to anal fin origin, anal fin with weakly concave posterior margin and long preanal ridges, and no keels on caudal peduncle, readily distinguishes this species from other carcharhinid sharks occurring in the area.



**SIZE:**

Maximum: 91 cm, maturing at 73 to 85 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, ranging from Natal, South Africa, southern Mozambique, arid Madagascar to the Red Sea, Gulf of Oman, India and probably Sri Lanka; also Mauritius and the Seychelles. Elsewhere, primarily in continental waters of the Indo-West Pacific eastward to Japan, Taiwan Island, the Philippine Islands and Australia.

Occurs in tropical, coastal, clear waters, near the surface and bottom; inshore and offshore at depths from 7 to 80 m. Viviparous, number of young usually 2 in a litter. Size at birth probably about 42 or 43 cm.

A common small, harmless shark, probably feeding on small fishes and crustaceans.

**PRESENT FISHING GROUNDS:**

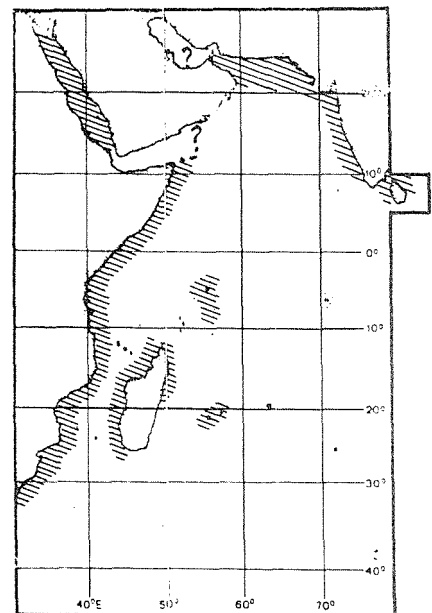
Probably throughout the area wherever it occurs, but definitely off India (especially in the extreme southeast, where it is one of the most abundant sharks caught).

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in floating and bottom gillnets and with tine gear (including pelagic longlines).

Utilized fresh for human consumption.



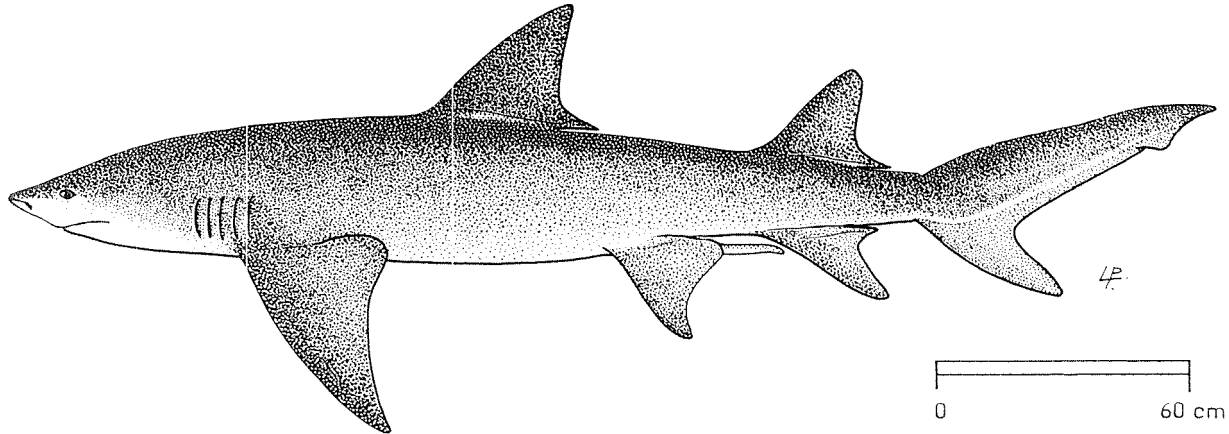
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

Negaprion acutidens (Rüppell, 1837)

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

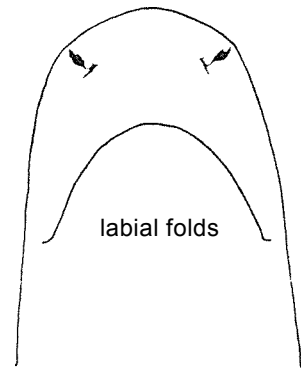
- FAO: En - Sicklefim lemon shark
- Fr - Requin citron faucille
- Sp - Tiburón segador

NATIONAL:

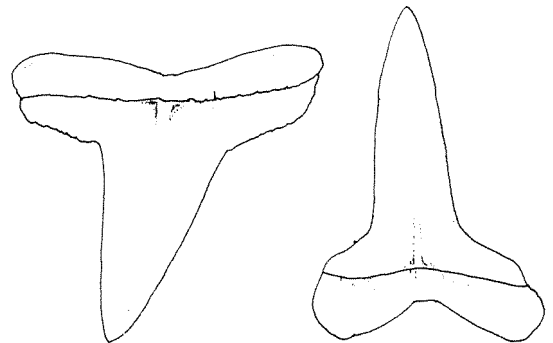
DISTINCTIVE CHARACTERS:

A large, stout shark. Snout short (shorter than width of mouth) and broad, rounded or obtusely wedge-shaped; labial folds short; spiracles usually absent; teeth narrow, their cusps smooth-edged, erect in anterior part of jaws, but becoming progressively oblique toward the sides; bases of upper teeth smooth or weakly serrated. Origin of first dorsal fin over or behind free rear tips of pectoral fins, closer to these fins than to the pelvics; second dorsal fin nearly as large as the first (its base more than 3/4 of first dorsal fin base); pectoral fins broad and strongly falcate, pelvic fins falcate. No dermal ridge between dorsal fins.

Colour: yellowish brown above, paler below.



underside of head



upper tooth and lower tooth  
near centre

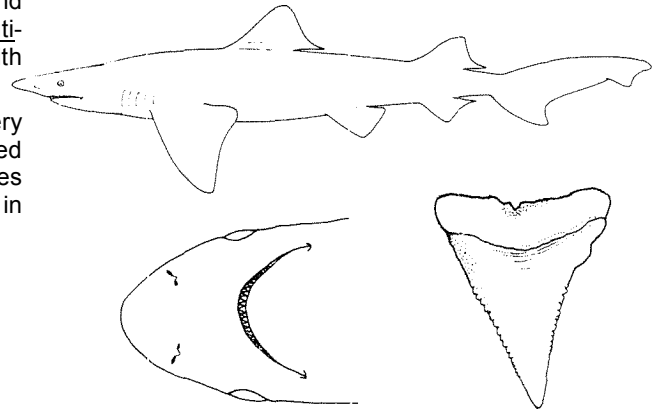
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Lamiopsis temmincki: snout longer, about equal to mouth width, and more narrowly rounded; upper teeth with broadly triangular, strongly serrated cusps and bases, lower teeth narrow-cusped and smooth-edged; dorsal and pelvic fins not falcate (strongly so in Negaprion acutidens), pectoral fins broader and less falcate, anal fin with weakly concave posterior margin.

The combination of characters such as the very large second dorsal fin, the short and broadly rounded snout and the characteristic teeth, readily distinguishes this species from other carcharhinid sharks occurring in the area.

### SIZE:

Maximum: 310 cm; maturing to 214 cm.



underside of head upper tooth

Lamiopsis temmincki

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, from northern Natal, South Africa, Madagascar, Mauritius and the Seychelles to the Red Sea, India and probably Sri Lanka. Elsewhere, wide-ranging in the Indo-West Pacific, extending to the Australian region and Oceania.

Occurs in tropical, shallow inshore and offshore waters near the bottom; often found on and around coral reefs and on sandy plateaus near coral, at depths down to at least 30 m. Viviparous, 12 or 13 young in a litter; size at birth about 70 to 80 cm.

A fish-eating shark, but few details of its diet are available from the area. Potentially dangerous because of its large size, powerful jaws and dagger-like teeth; normally inoffensive and sluggish but very aggressive when provoked.

### PRESENT FISHING GROUNDS:

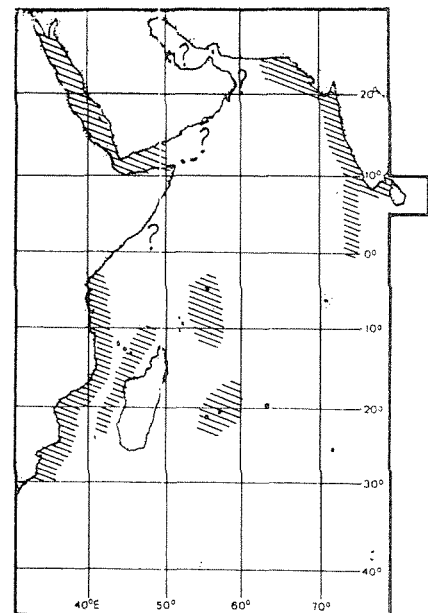
Probably throughout the area, but definitely off Pakistan and India.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught in floating and bottom gillnets and on line gear (including floating longlines).

Used fresh and dried-salted for human consumption; livers processed for vitamin oil; offal processed for fishmeal; and fins used for the oriental sharkfin trade. Fins of this species are considered the best for soup of any sharks caught in southeastern India.



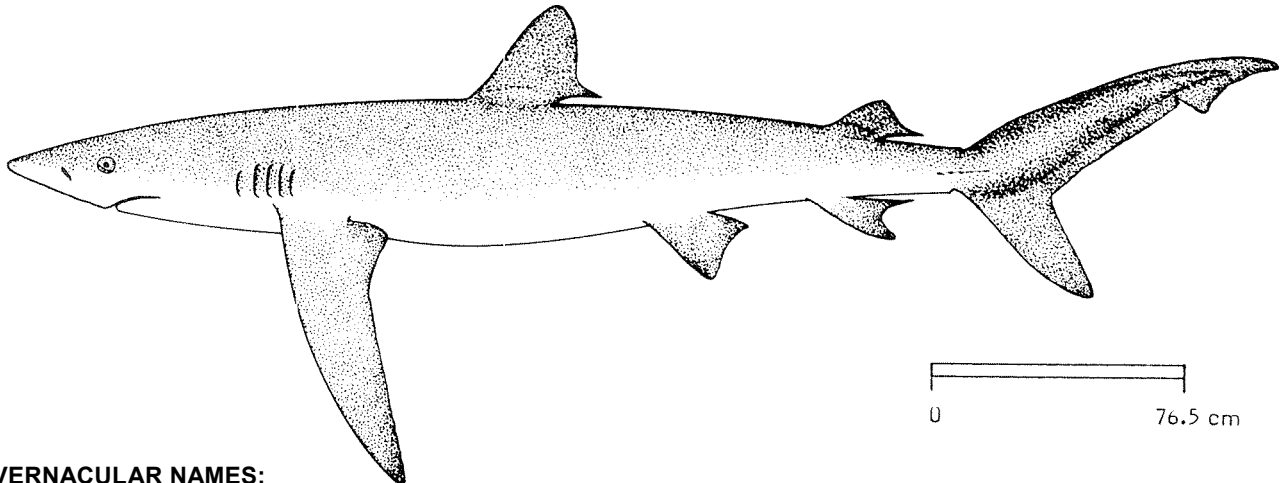
FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Prionace glauca* (Linnaeus, 1758)

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

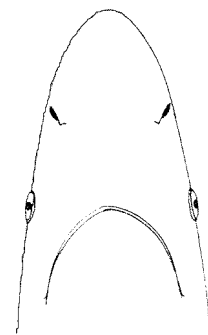
- FAO En - Blue shark
- Fr - Peau bleue
- Sp - Tiburón azul

NATIONAL:

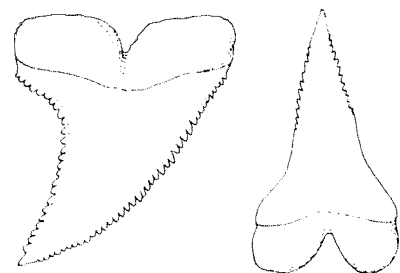
DISTINCTIVE CHARACTERS:

A very slender, fusiform shark. Snout long, (its length greater than mouth width and narrowly rounded; upper labial folds very short; spiracles absent; nictitating eyelids present; teeth serrated, broadly triangular and curved in upper jaw, narrower in lower jaw; upper medial tooth very large, nearly the size of teeth on either side of it (but sometimes absent); inner gill arches with gillraker papillae (visible through open mouth . First dorsal origin well posterior to free rear tips of pectoral fins, its base closer to pelvic than to pectoral fin origins; second dorsal fin much smaller than first; pectoral fins very long, narrow and somewhat falcate. A weak keel present on sides of caudal peduncle. No dermal ridge between dorsal fins.

Colour: dark blue above, bright blue on sides, white below, fading to purple-blackish after death; tips of pectorals and anal dusky.



underside of head

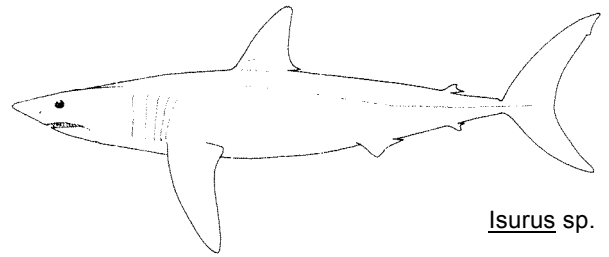


upper tooth and lower tooth  
near centre

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

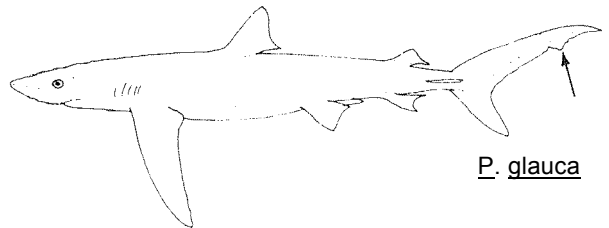
The combination of characters such as the unique colouration, the long snout and pectoral fins, the characteristic teeth, the posterior position of first dorsal fin, the gillrakers, and the weak precaudal keels, readily distinguishes this species from other carcharhinids in the area.

Isurus species (Lamnidae): also blue above but with characteristic unserrated teeth, a conical snout, no nictitating eyelids, longer gill slits, strong caudal keels, and a lunate caudal fin.



**SIZE:**

Maximum recorded: 383 cm, though larger specimens (up to 4.8 to 6.5 m) are mentioned on poor evidence in the literature. Most specimens below 335 cm.

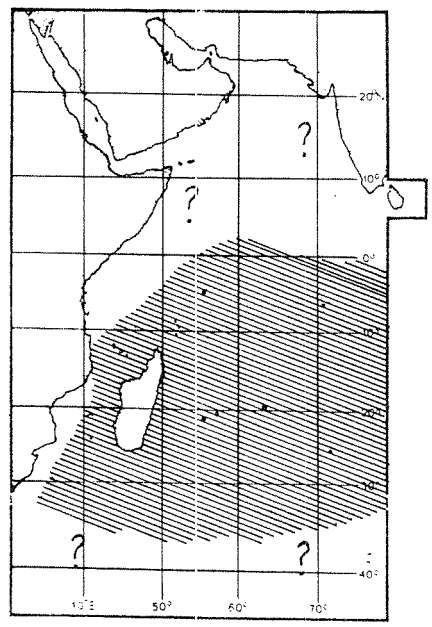


**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Apparently wide-ranging in the area, but details of its distribution in the area north of the Comores Islands are sketchy; apparently absent from the Red Sea and the "Gulf". the most wide-ranging of cartilaginous fishes, apparently present in all tropical to cool-temperate seas, with only a few exceptions.

A slow-cruising, very common oceanic species capable of bursts of speed when excited. Usually well offshore and in the open sea near the surface, but sometimes penetrating coastal waters. Viviparous, litters usually large, ranging from 4 to 63 young.

Feeds on a wide variety of bony fishes, small sharks, squids, pelagic crustaceans and occasionally sea birds and carrion. Sometimes aggressive to people in the water, and considered a dangerous species although attacks on people are relatively uncommon.



**PRESENT FISHING GROUNDS:**

Offshore waters in the area.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught mainly with pelagic longlines in the area.

Mode of utilization not reported.

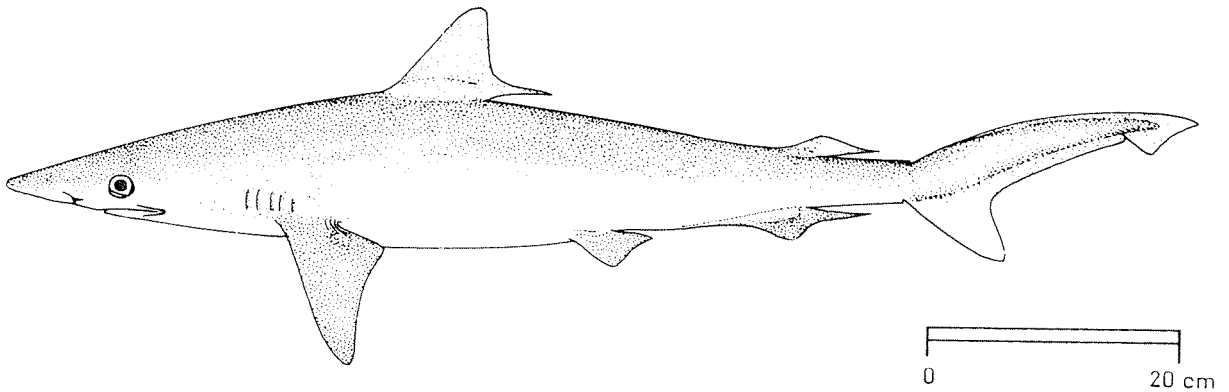
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Rhizoprionodon acutus</i> (Rüppell, 1837)
--

## OTHER SCIENTIFIC NAMES STILL IN USE:

*Scoliodon acutus* (Rüppell, 1837)*Scoliodon palasorra* (Bleeker, 18153)*Scoliodon walbeehmi* (Bleeker, 1856)

## VERNACULAR NAMES:

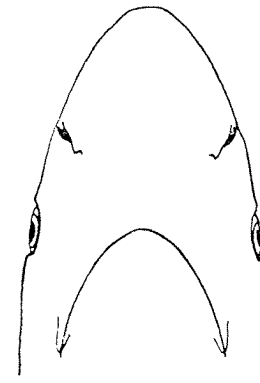
FAO: En - Milk shark  
Fr - Requin à museau pointu  
Sp - Cazón picudo

NATIONAL:

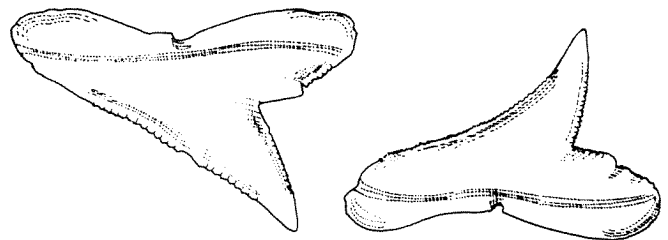
## DISTINCTIVE CHARACTERS:

A small, slender shark. Snout long and depressed, its length usually greater than width of mouth, its tip narrowly rounded; eyes without a posterior notch; no spiracles; labial furrows well-developed and moderately long, the upper ones about equal in length to eye diameter and ending well behind eyes; teeth similar in both jaws, low-crowned, oblique and narrow-cusped, with the outer edges deeply notched and without cusplets, smooth-edged in young but often finely serrated in adults. Origin of first dorsal fin over or posterior to inner corners of pectoral fins, base length of first dorsal twice or less in distance between pectoral and pelvic fin bases, free rear tip usually anterior to pelvic fin origins; second dorsal fin smaller than anal fin, its origin far posterior to midlength of anal fin base; anal fin with slightly concave posterior margin and a pair of long preanal ridges.

Colour: grey or grey-brown above, white below, dorsal and anal fins with dusky or blackish edges, fins slightly darker than back.



underside of head



upper and lower lateral teeth

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Rhizoprionodon oligolinx: often stouter body, upper labial furrows very short, much less than eye length, precaudal vertebrae more, 84 to 91 (55 to 79 in R. acutus); fresh specimens examined lighter and more bronzy but usually darker when preserved.

Loxodon macrorhinus: labial furrows very short, eyes with posterior notches, origin of first dorsal fin behind pectoral free rear tips, first dorsal fin base over two times in distance between pectoral and pelvic fin bases.

Scoliodon laticaudus: head and snout broader and more flattened, labial furrows shorter, body stouter, free rear tip of first dorsal fin usually reaching pelvic mid bases, pectoral fins broadly triangular, preanal ridges short, and caudal fin not deeply notched on its postero-ventral margin.

Carcharhinus macloti: labial furrows very short, teeth with more erect cusps, the uppers with strong cusplets, first dorsal fin with a longer free rear tip, second dorsal fin origin in front of anal midbase, anal fin with very short preanal ridges and with a deeply notched posterior margin.

The combination of characters including the small size, long snout, slender body, absence of spiracles, moderately long labial furrows, unnotched eyes, oblique, narrow-cusped teeth without cusplets in both jaws, very low second dorsal fin originating about over anal fin insertion, small pectoral fins, slightly concave posterior margin of anal fin and long preanal ridges serves to distinguish this shark from other carcharhinids occurring in the area.

**SIZE:**

Maximum: to 102 cm; adults maturing at 68 to 72 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, widespread from South Africa and Madagascar along the east African coast to the Red Sea, then east to the "Gulf", Pakistan, India and Sri Lanka. Elsewhere, in the Eastern Atlantic from Madeira arid Mauritania to Angola; arid eastward from the area to Japan and Australia.

An extremely abundant, small, inshore and offshore shark of the tropics, ranging from the surfline down to at least 50 m depth, and occurring near the surface, as well as near the bottom. Viviparous, with 2 to 8 fetuses in a litter, gestation period about one year. Size at birth about 30 to 35 cm.

Feeds on small bony fishes and small crustaceans; harmless to people. Probably the most common or one of the most common small inshore sharks in the area.

**PRESENT FISHING GROUNDS:**

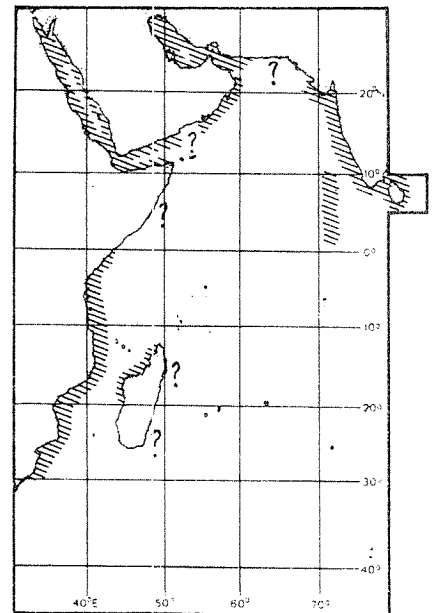
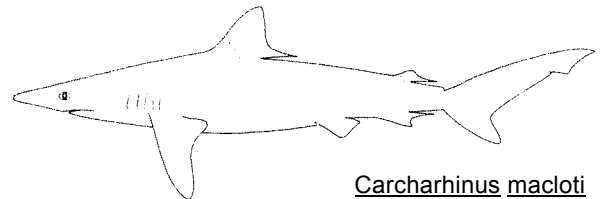
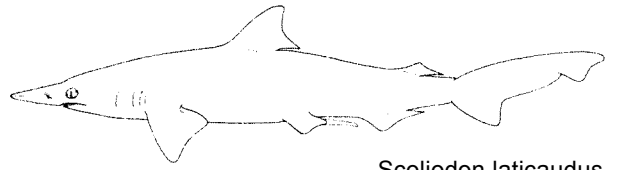
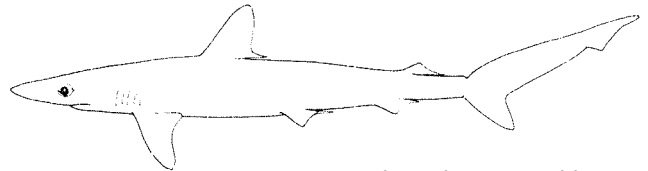
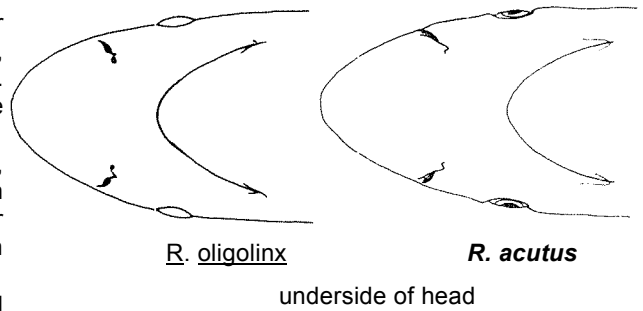
In the area, off Pakistan, India and Sri Lanka, but probably more widely taken in the region. Very common in catches.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught on line gear (including floating longlines set near the coasts), and especially floating and bottom gillnets.

Utilized fresh for human consumption; also for fishmeal.



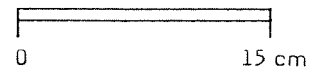
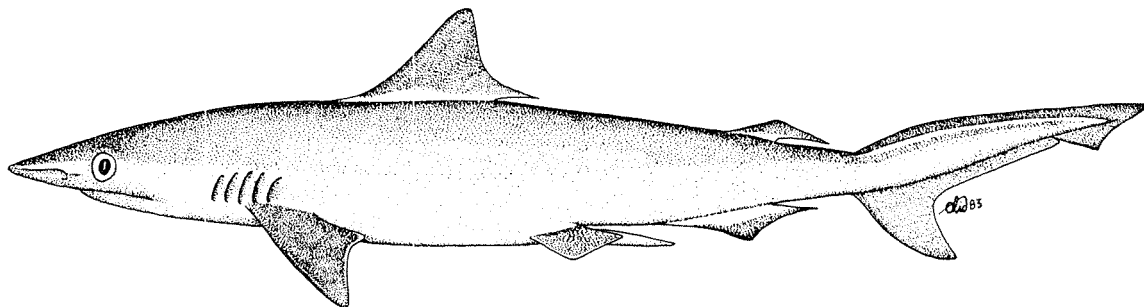


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

Rhizoprionodon oligolinx Springer, 1964

OTHER SCIENTIFIC NAMES STILL IN USE : Scoliodon palasorra (Bleeker, 1853)

## VERNACULAR NAMES:

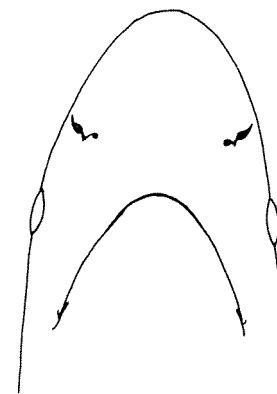
FAO : En - Grey sharpnose shark  
Fr - Requin aiguille gris  
Sp - Cazón picudo gris

NATIONAL:

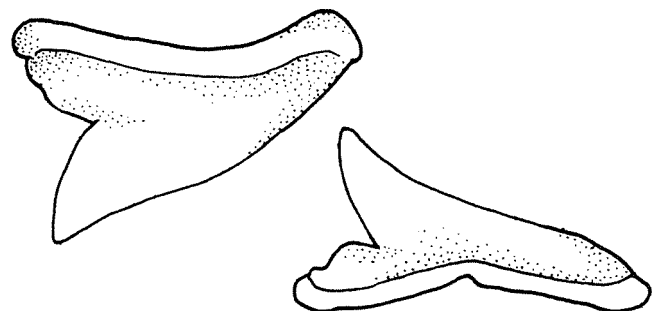
## DISTINCTIVE CHARACTERS:

A small, slender shark. Snout long and depressed, its length usually greater than width of mouth, its tip narrowly rounded; eyes without a posterior notch; no spiracles; labial furrows very short, much less than eye length, ending well behind eyes; teeth similar in both jaws, low-crowned, oblique and narrow-cusped, with the outer edges deeply notched and without cusplets, smooth-edged in young but often finely serrated in adults. Origin of first dorsal fin over or posterior to inner corners of pectoral fins, its base length less than 2 times in distance between pectoral and pelvic fin bases, its free rear tip usually anterior to pelvic fin origins but occasionally over them; second dorsal fin smaller than anal fin, its origin far posterior to midlength of anal fin base; anal fin with slightly concave posterior margin and a pair of long preanal ridges.

Colour: grey or grey-brown above, white below, dorsal and anal fins with dusky or blackish edges, fins slightly darker than back.



underside of head



upper and lower lateral teeth

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Rhizoprionodon acutus: body often more slender, upper labial furrows rather long (about eye length), pre-caudal vertebrae less, 55 to 79 (84 to 91 in R. oligolinx); fresh specimens usually darker and not as bronzy but lighter when preserved.

Loxodon macrorhinus: body usually more slender, eyes with posterior notches, origin of first dorsal fin behind pectoral free rear tips, first dorsal fin base over 2 times in distance between pectoral and pelvic fin bases.

Scoliodon laticaudus: head and snout broader and more flattened, body stouter, free rear tip of first dorsal fin usually reaching pelvic midbases, pectoral fins broadly triangular, preanal ridges short, and caudal fin not deeply notched on its posteroventral margin.

Carcharhinus macloti: teeth with more erect cusps, the uppers with strong cusplets, first dorsal fin with longer free rear tip, second dorsal fin origin in front of anal midbase, anal fin with very short preanal ridges and with a deeply notched posterior margin.

The combination of characters, including the small size, moderately long snout, absence of spiracles, unnotched eyes, short labial furrows, oblique, narrow-cusped teeth without cusplets and serrations in both jaws, second dorsal fin very low, originating about over anal fin insertion, small pectoral fins, slightly concave posterior margin of anal fin, and long preanal ridges, serves to distinguish this shark from other carcharhinids occurring in the area.

**SIZE:**

Maximum: about 61 cm; males may mature at 38 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, confined to the northeast part from the "Gulf", Pakistan, India and Sri Lanka. Elsewhere, eastward from the area to Thailand, Malaya, Indonesia and Japan.

A common small inshore and offshore shark of coastal tropical waters, ranging down to at least 36 m depth from close inshore. Viviparous, size at birth about 21 to 26 cm.

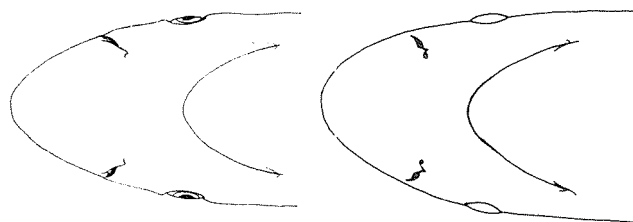
Probably feeds on small fishes and invertebrates; harmless to people.

**PRESENT FISHING GROUNDS:**

Throughout the area where it occurs. Commonly taken off south-eastern India.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

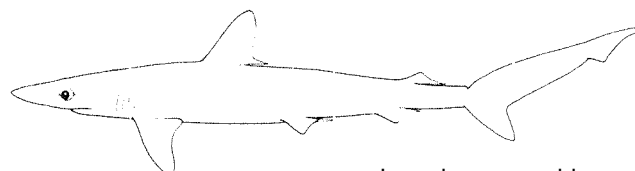
- Separate statistics are not reported for this species.
- Caught with floating and bottom gillnets, and line gear.
- Utilized fresh for human consumption; also for fishmeal.



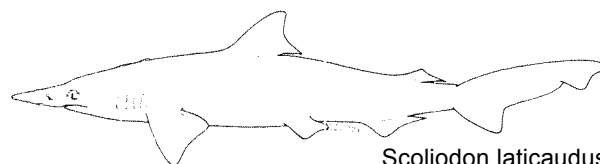
Rhizoprionodon acutus

R. oligolinx

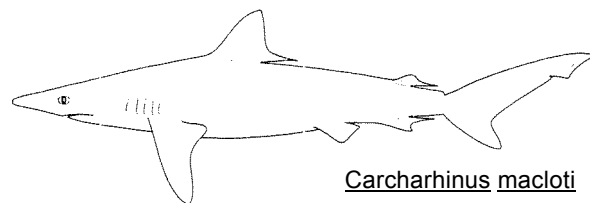
underside of head



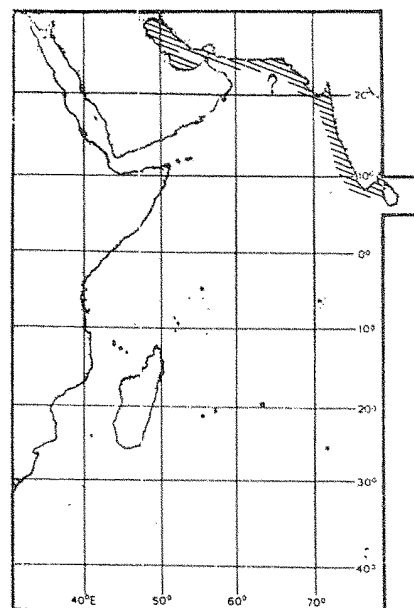
Loxodon macrorhinus



Scoliodon laticaudus



Carcharhinus macloti

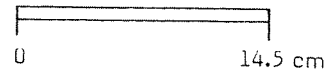
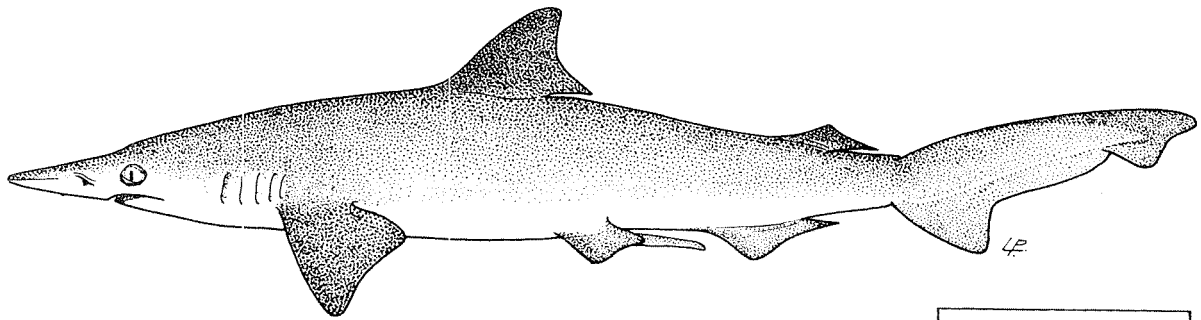


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Scoliodon laticaudus Müller & Henle, 1838

## OTHER SCIENTIFIC NAMES STILL IN USE:

Physodon muelleri (Valenciennes, in Müller & Henle, 1839)Scoliodon palasorra (Bleeker, 1853)Scoliodon sorrakowa (Bleeker, 1853)

## VERNACULAR NAMES:

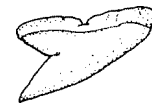
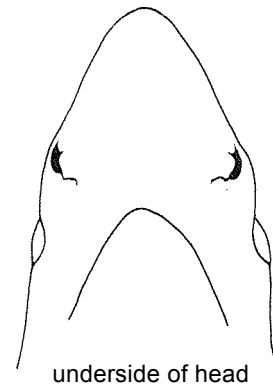
FAO : En - Spaderiose shark  
Fr - Requin épée  
Sp - Cazón espadachín

NATIONAL:

## DISTINCTIVE CHARACTERS:

A small shark. Body moderately stout and markedly compressed. Head and snout strongly depressed; snout long, narrowly rounded, its length greater than mouth width; labial furrows very short; anterior nasal flaps with a short, narrowly triangular lobe; eyes moderately large, without a posterior notch; spiracles absent; teeth similar in both jaws, oblique and narrow-cusped, with the distal edges deeply notched and without cusplets or serrations. First dorsal fin moderately large, its origin well behind pectoral free rear tips, its base closer to pelvic than to pectoral fin bases, and its free rear tip over or behind middle of pelvic fin bases; second dorsal fin very small, its height less than a third of that of first dorsal, its inner margin elongated and over twice the fin height, fin origin over or slightly anterior to anal fin insertion; pectoral fins small, broad, triangular, and not falcate, originating under or slightly anterior to 5th gill openings, anal fin with a slightly concave posterior margin and relatively short preanal ridges. Upper precaudal pit transverse and crescentic; no keels on caudal peduncle; no interdorsal ridge.

Colour: bronzy grey above, white below, fins sometimes darker than body; no conspicuous markings.



upper tooth and lower tooth  
near centre

### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

This species is readily distinguished from all other carcharhinids in the area by the following combination of characters: small size; compressed body; strongly depressed head and snout; long snout; short labial furrows; oblique-cusped, smooth-edged teeth without cusplets in both jaws; posterior position of first dorsal fin with rear tip over or behind pelvic midbases; small, low second dorsal fin with origin over or slightly anterior to end of anal fin base; broadly triangular (not falcate) pectoral fins, with origins about under the 5th gill openings; anal fin with a slightly concave posterior margin and short preanal ridges.

### SIZE:

Maximum: about 74 cm, but most individuals smaller.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, mostly confined to the northeastern part, including "the Gulf", Pakistan, India and Sri Lanka, but recently taken off Tanzania. Elsewhere, in the Eastern Indian Ocean and the Western Central Pacific ranging eastward to Thailand, China, Japan and Borneo, but absent from Oceania or the Australasian Region.

Occurs in tropical, coastal waters, often near the bottom in rocky areas. Viviparous, number of young 5 to 14. Size at birth about 13 to 15 cm. A small harmless shark, very abundant where it occurs in the area, and forming large schools.

Feeds on shrimps, cuttlefishes, and small schooling fishes including anchovies, bregmacerotids, tripauchenids, and Bombay ducks (*Harpodon nehereus*).

### PRESENT FISHING GROUNDS:

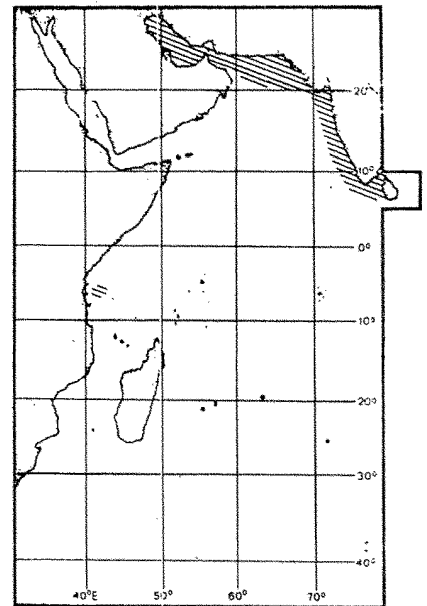
Throughout the northeastern part of the area.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with line gear, including floating longlines, and surface and bottom gillnets.

Utilized fresh for human consumption; offal for fishmeal, and as bait for other fishes.



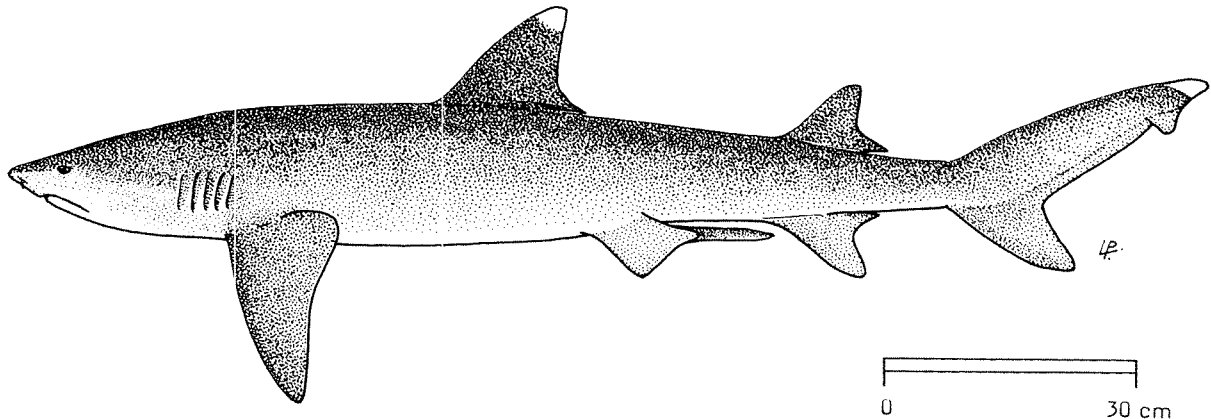
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CARCHARHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Trienodon obesus</i> (Rüppell, 1837)
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OTHER SCIENTIFIC NAMES STILL IN USE: None



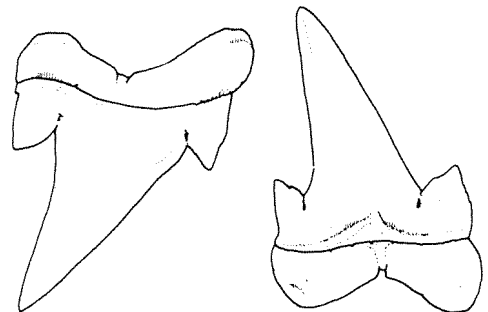
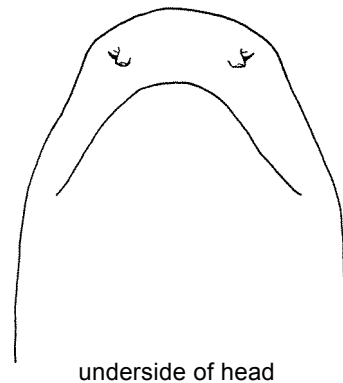
## VERNACULAR NAMES:

FAO : En - Whitetip reef shark  
Fr - Requin corail  
Sp - Cazón coralero trompacorta

NATIONAL:

## DISTINCTIVE CHARACTERS:

A small to medium-sized shark. Body moderately stout. Snout very short, broadly rounded, its length much less than mouth width and equal to or less than distance between nostrils; labial furrows very short; anterior nasal flaps with a short, truncate prominent lobe, formed into a partial tube; spiracles usually absent small ones present in a few specimens; teeth in upper and lower jaws with high, narrow, smooth-edged cusps with strong cusplets on each side, no serrations. First dorsal fin moderately large, with a narrowly rounded apex, its origin well posterior to pectoral free rear tips, its base closer to the pelvic fins than the pectorals, and its free rear tip about over the pelvic fin origins; second dorsal fin very large, about half the surface of first dorsal and over half its height, its inner margin shorter than fin height, its origin over or slightly anterior to anal fin origin; pectoral fins moderately long, moderately narrow, slightly falcate, and with narrow tips; anal fin with posterior margin deeply notched; upper precaudal pit transverse and crescentic. No dermal ridge between dorsal fins, and no keels on caudal peduncle.



upper tooth                      and                      lower tooth  
near centre

Colour: grey-brown above, sometimes with a few or several dark spots on sides, first dorsal and dorsal caudal lobe with conspicuous white tip, second dorsal and ventral caudal lobe often white-tipped; ventral surface cream-white.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

This species can be readily distinguished from all other carcharhinids in the area by the following combination of characters: snout very short, bluntly rounded; nasal flaps tubular; teeth smooth-edged with strong cusplets in both jaws; relatively posterior position of first dorsal fin (closer to pelvic than to pectoral fins); second dorsal fin large, about half the size of first dorsal; second dorsal fin and upper lobe of caudal fin conspicuously white-tipped.

## SIZE:

Maximum: possibly 213 cm, but most adults below 160 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, wide-ranging from South Africa to the Red Sea, Pakistan, India and Sri Lanka; also Madagascar, Seychelles, Mauritius, Chagos Archipelago, Aldabra and Tromelin Islands. Elsewhere, widespread in the Eastern Indian Ocean and the Western, Central and Eastern Pacific; it has an extensive distribution among islands of the tropical Pacific.

Occurs in tropical, coastal clear waters, usually on or around coral reefs; commonly in holes and crevices, often in shallow water near the bottom, but exceptionally at considerable depths down to 330 m. Viviparous, number of young 1 to 5 in a litter. Size at birth about 52 to 60 cm.

A common reef shark, feeding on a wide variety of reef fishes including moray eels, squirrelfishes, snappers, damselfishes, parrotfishes, surgeonfish, triggerfishes, goatfishes; also octopi, lobsters and crabs. A relatively non-aggressive shark to people in the water, and generally considered as not particularly dangerous. In response to exciting stimuli, especially speared fish, this shark has been known to attack divers, but never with serious results. Flesh and liver sometimes toxic in the Western-Central Pacific, but not in Fishing Area 51.

## PRESENT FISHING GROUNDS:

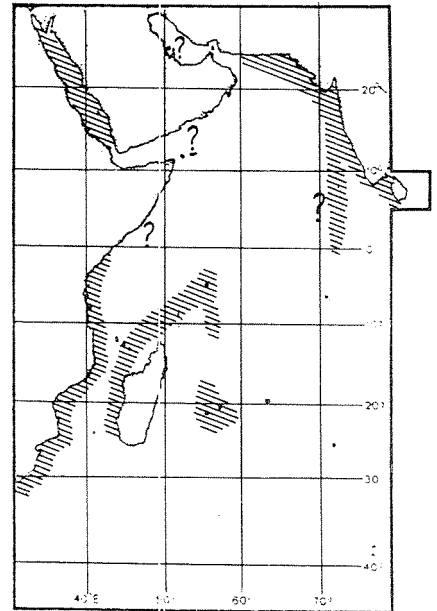
Known fishing grounds in the area are found off India and Sri Lanka, but probably fished elsewhere. Relatively uncommon as a commercial catch in the area.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught in floating and bottom gillnets and with line gear, including floating longlines.

Utilized fresh for human consumption.



CHLAM

1983

**FAO SPECIES IDENTIFICATION SHEETS**

**FISHING AREA 51  
(W. Indian Ocean)**

CHLAMYDOSELACHIDAE

Friiled sharks

A single species in the area - see species sheet for:

Chlamydoselachus, anguineus Garman, 1884

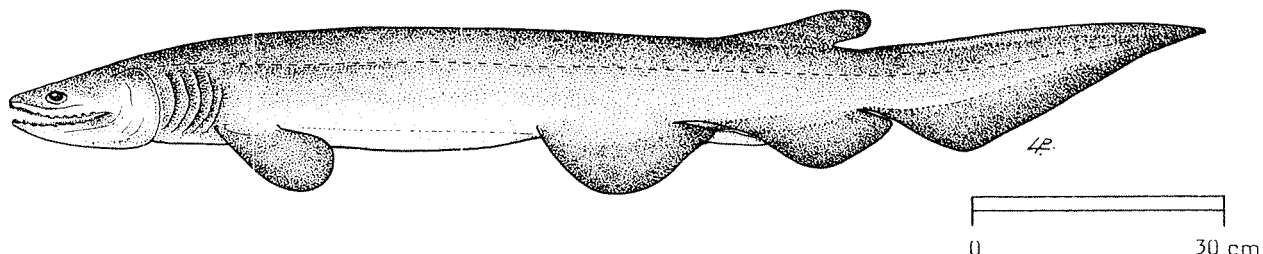
CHLAM Chlam 1

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CHLAMYDOSELACHIDAE

FISHING AREA 51  
(W. Indian Ocean)Chlamydoselachus anguineus Garman, 1884

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

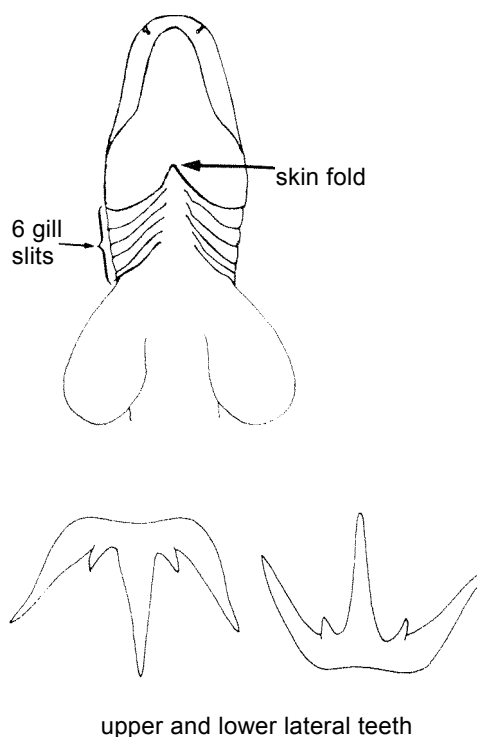
FAO: En - Frilled shark  
Fr - Requin lézard  
Sp - Tiburón anguila

NATIONAL:

## DISTINCTIVE CHARACTERS:

A medium-sized shark with a long, eel-like body. Head with 6 pairs of long and frilly gill slits, the last in front of pectoral fin origins, the first connected to each other across the throat by a flap of skin; no gillrakers on inner gill slits; nostrils without barbels or nasoral grooves; no nictitating lower eyelids; snout very short, bluntly rounded; mouth extremely long, extending far behind the eyes, and nearly terminal; teeth of upper and lower jaws alike, with 3 strong cusps and a pair of minute cusplets between them, not compressed or bladelike. A single dorsal fin, posterior to pelvics; anal fin present; caudal fin strongly asymmetrical, without a subterminal notch or a lower lobe. Caudal peduncle not depressed, without keels or precaudal pits. Intestinal valve of spiral type.

Colour: grey-brown above, sometimes lighter below, fins dusky.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

The combination of the characters described above readily distinguishes this species from all other sharks occurring in the area.



**SIZE:**

Maximum: about 196 cm; common to 150 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

A relatively rare, wide-ranging, deepwater bottom-dwelling shark, sporadic in its occurrence in the area and elsewhere. At present known only from off South Africa in the area, but likely to be found elsewhere. It also occurs in the Eastern Atlantic and Western and Eastern Pacific.

Usually it is found on the outer continental shelves and upper slopes, at depths between 120 and 1 280 m, but sometimes comes into shallow waters. Ovoviviparous, number of young 8 to 12, size at birth about 39 cm.

**PRESENT FISHING GROUNDS:**

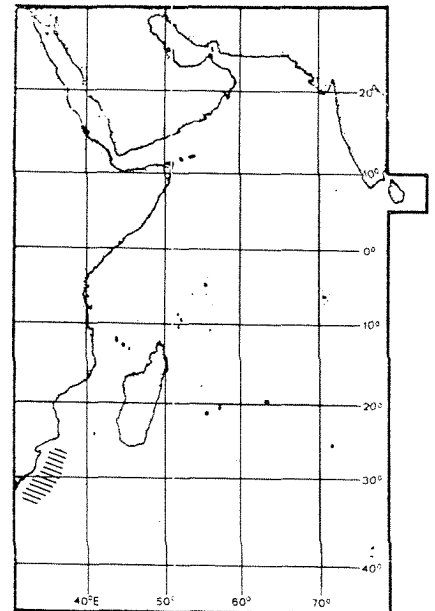
Incidentally caught offshore in deepwater.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Rarely taken in bottom trawls.

Used for fishmeal.



ECHIN

1983

**FAO SPECIES IDENTIFICATION SHEETS**

**FISHING AREA 51  
(W. Indian Ocean)**

ECHINORHINIDAE

Bramble sharks

A single species in the area - see species sheet for:

Echinorhinus brucus (Bonnaterre, 1788) ECHIN Echin 1

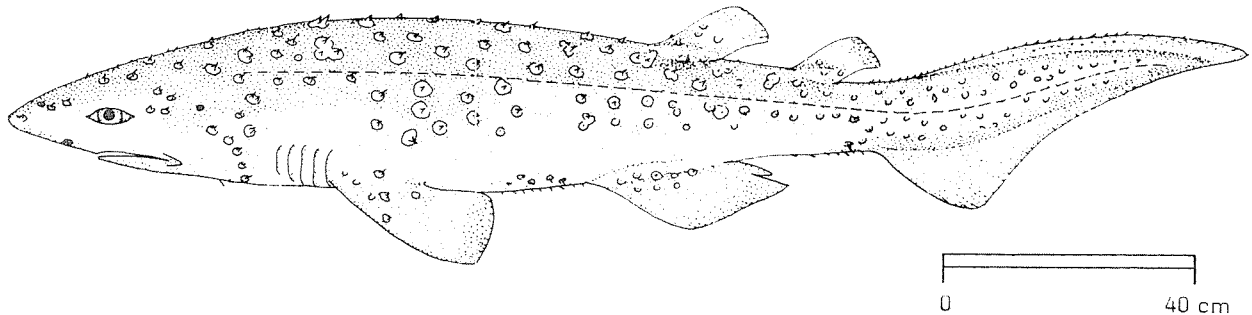
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ECHINORHINIDAE

FISHING AREA 51  
(W. Indian Ocean)

Echinorhinus brucus (Bonnaterre, 1788)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

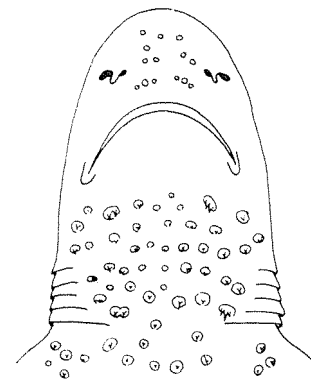
FAO: En - Bramble shark  
Fr - Squale bouclé  
Sp - Tiburón de clavos

NATIONAL:

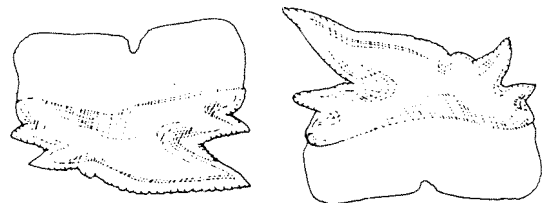
## DISTINCTIVE CHARACTERS:

A medium-sized, heavy-bodied shark with very large, platelike deriticles scattered sparsely over the body and armed with one or more thornlike cusps. Head with 5 gill slits, all anterior to pectoral fins, the fifth abruptly elongated at lower end; snout broadly rounded; mouth extending to behind eyes; spiracles always present, small-sized; eyes on sides of head, without nictitating eyelids; teeth small, strongly compressed, bladelike, and alike in both jaws, with a strong primary cusp and one or more cusplets on either side; the cusplets increase with tooth replacement during growth. Dorsal fins spineless, the first originating over or posterior to pelvic fin origins; second dorsal fin s.bout as large as first; inner corners of pectorals rounded; pelvics much larger than second dorsal; anal fin absent; caudal fin strongly asymmetrical, without a well-developed lower lobe. Caudal peduncle riot depressed, without keels or precaudal pits. Intestinal valve of spiral type.

Colour: dark grey or purplish grey to dull brown or olive above, lighter to white below with or without darker blackish or reddish blotches on sides.



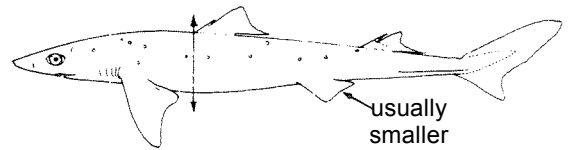
underside of head



upper and lower lateral teeth

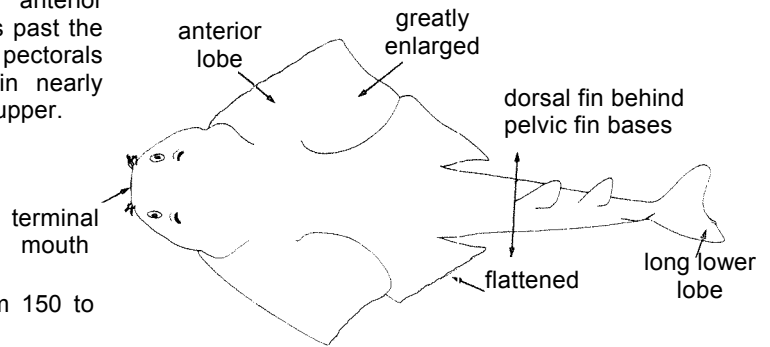
**DISTINGUISHING CHARACTERS OF SIMILAR FAMILIES OCCURRING IN THE AREA:**

Squalidae and Pristiophoridae: denticles smaller, more closely set. not platelike; fifth gill slits not abruptly larger than first to fourth; spiracles larger; first dorsal fin origin well anterior to pelvic origins; pelvic fins usually about as large as second dorsal fin or smaller; Pristiophoridae also with rostral saw and barbels.



Squalidae

Squatinae: trunk much flattened dorsoventrally; mouth terminal; eyes on upper surface of head; teeth not bladelike, with a single cusp and no cusplets; origin of first dorsal fin posterior to pelvic fin bases; anterior margins of pectorals expanded as triangular lobes past the gill slits and partly concealing them; both the pectorals and pelvics very large and winglike; caudal fin nearly symmetrical, but with a lower lobe longer than the upper.



Squatinae

All other shark families: anal fin present.

**SIZE:**

Maximum: to about 274 cm; common from 150 to 260 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

A wide ranging, temperate to tropical shark found off South Africa, Oman, and southern India. Elsewhere, in the Eastern Atlantic, Mediterranean Sea, Western Atlantic and Western Pacific.

An inhabitant of the outer continental shelves and upper continental slopes, commonly found at depths between 400 and 900 m, but occasionally occurring in shallow waters. A bottom-dwelling species, probably slow-swimming. Ovoviviparous, with up to 24 young, size at birth at least 30 cm.

Feeds on small bony fishes, other sharks, and crabs.

**PRESENT FISHING GROUNDS:**

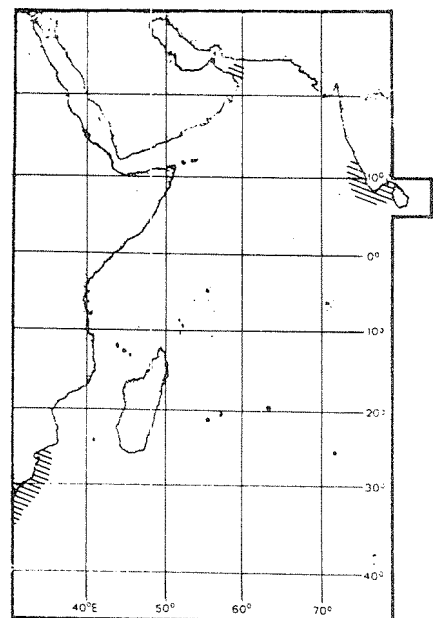
Offshore, rarely caught.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls.

Used for fishmeal and liver oil, flesh used for medicinal purposes in South Africa.



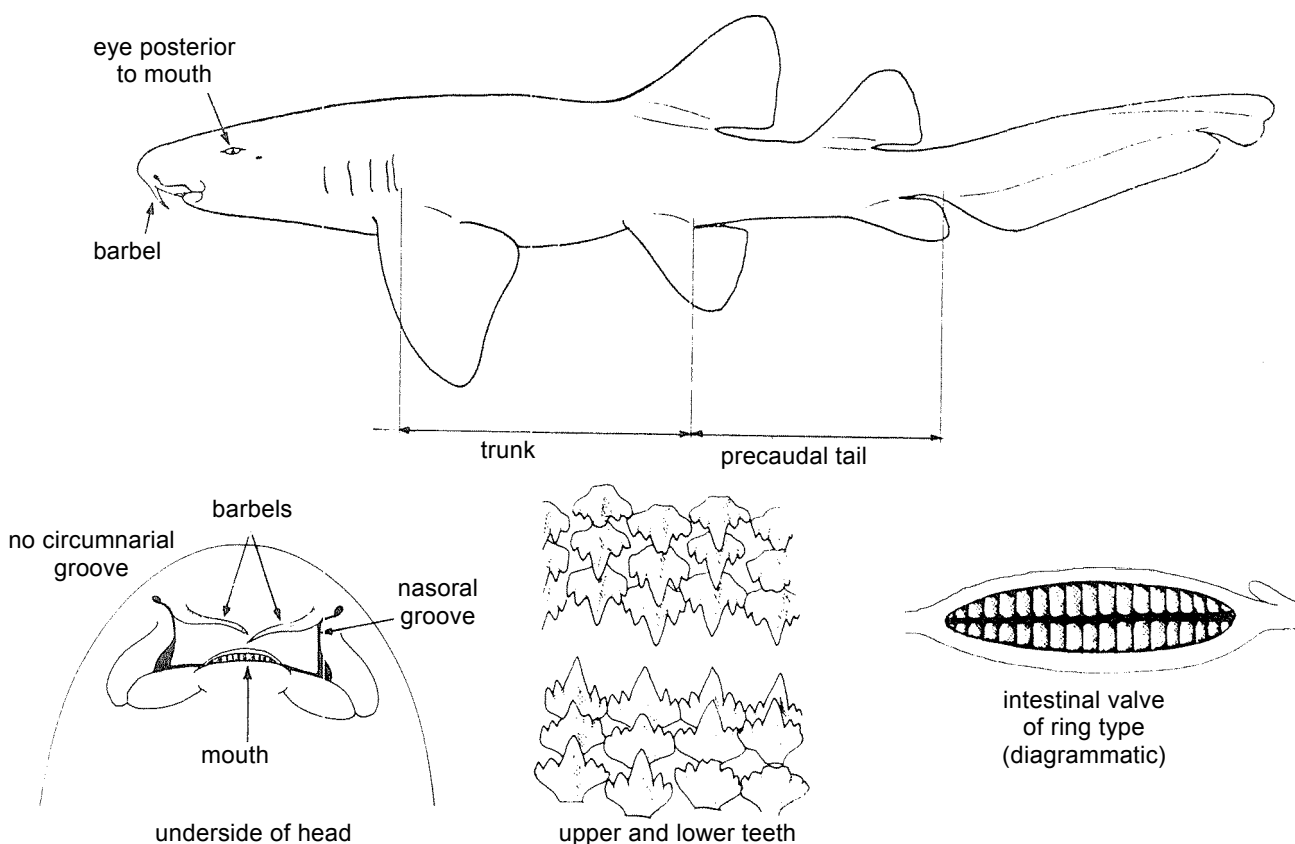
FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

GINGLYMOSTOMATIDAE

Nurse sharks

Small to large-sized sharks. Trunk and precaudal tail cylindrical, not depressed and without lateral ridges; precaudal tail shorter than trunk. Head not expanded laterally, moderately depressed; 5 small gill slits present, the last 2 over or behind pectoral fin origins, their upper ends not expanded onto upper surface of head; no gill sieves or rakers on internal gill slits; spiracles present and very small, below level of eyes; nostrils with well-developed barbels and nasal grooves but without circumnarial grooves, close in front of mouth; eyes on, or just above, sides of head, without nictitating eyelids; snout very short, very broadly rounded or truncated, moderately depressed, but not bladeliike and without lateral teeth and barbels; mouth moderately large, short, transversely arched, and well in front of eyes; labial furrows large, present on both jaws, and with the uppers reaching front of mouth; teeth small, bladeliike or not, with a single cusp and one or more cusplets on either side; teeth similar in upper and lower jaws and poorly differentiated along each jaw; no enlarged anteriors, intermediates, or lateral tooth rows formed from the continuously varying dentition. Two dorsal fins, without spines, the first dorsal moderately large, high and rounded or angular, much shorter than the caudal fin, and with its origin over or somewhat posterior to the pelvic fin on ins but not posterior to the pelvic fin bases; second dorsal fin either as large as the first dorsal or about 2/3 its size; anal fin present, moderately large, and angular, with its origin under the second dorsal fin base; caudal fin strongly asymmetrical, much less than half of total length, without a rippled or undulated dorsal margin but with a strong subterminal notch; lower lobe absent or very short; vertebral axis of caudal fin raised above body axis. Caudal peduncle cylindrical, without precaudal pits or longitudinal keels. Intestinal valve of ring type.

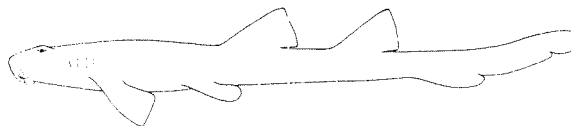


Colour: pale brown, dark brown, reddish brown, yellow or olive above, lighter below; one species with dorsal saddles and dark spots in young, fading and lost in adults.

Nurse sharks are small to relatively large, common inshore sharks of the tropical continental and insular seas of the world, often found on coral reefs. They eat a wide variety of small bony fishes and invertebrates, sucked into their mouths by the strong, bellows-like action of their oral cavities. They are taken in inshore line and net fisheries for sharks and are prized for their extremely thick, tough, durable skin, which makes excellent leather; also used for food, fresh or dried-salted, livers for vitamin oil, and offal for fishmeal.

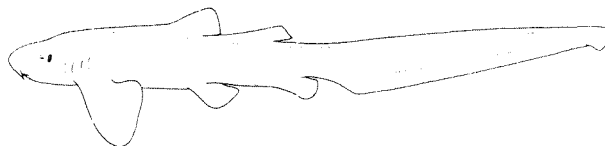
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Hemiscylliidae: precaudal tail longer than trunk; spiracles large, nearly or quite eye length; nostrils with circumnarial grooves; anal fin very low and arcuate.



Hemiscylliidae

Stegostomatidae: body with lateral ridges; spiracles as large as, or larger than eyes; first dorsal fin with origin far anterior to pelvic fin origins; caudal fin about half of total length.

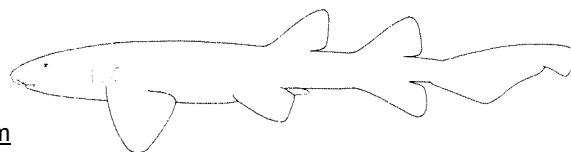


Stegostomatidae

The combination of characters such as the nasoral grooves, the presence of barbels, the anterior mouth, the posterior position of the first dorsal fin, the absence of nictitating lower eyelids, the absence of body ridges, caudal keels and precaudal pits, and the asymmetrical caudal fin with ventral lobe weak or absent readily distinguishes this family from all others in Fishing Area 51.

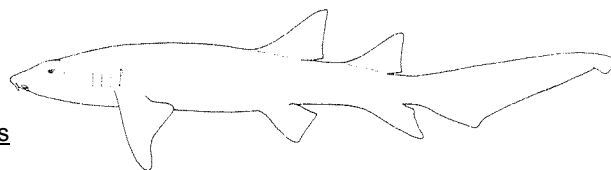
**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

1a. Nasal barbels very short not reaching mouth; teeth narrow, not bladelike, with large primary cusps and small cusplets; origin of first dorsal fin behind pelvic fin origins; second dorsal and anal fins as large as first dorsal; pectoral, pelvic, dorsal and anal fins broadly rounded; caudal fin without a ventral lobe, less than 1/4 of total length (Fig.1) ..... Ginglymostoma brevicaudatum



Ginglymostoma brevicaudatum Fig.1

1b. Nasal barbels longer, nearly or quite reaching mouth; teeth broad, more bladelike, with small primary cusps and several cusplets, somewhat comb-shaped; origin of first dorsal fin in front of pelvic fin origins; second dorsal and anal fins smaller than first dorsal fin; pectoral, pelvic, dorsal and anal fins narrow and angular or even falcate; caudal fin with a short ventral lobe, more than 1/4 of total length (Fig.2) ..... Nebrius ferrugineus



Nebrius ferrugineus Fig.2

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

<u>Ginglymostoma brevicaudatum</u> Günther, in Playfair & Günther, 1866	GINGL Gingl 2
<u>Nebrius ferrugineus</u> (Lesson, 1830)	GINGL Neb 1

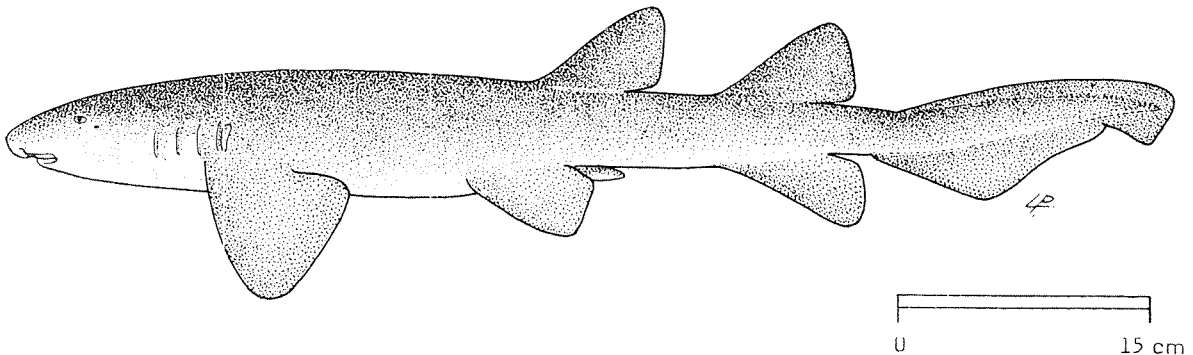
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: GINGLYMOSTOMATIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Ginglymostoma brevicaudatum</i> Günther, in Playfair & Günther, 1866
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OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

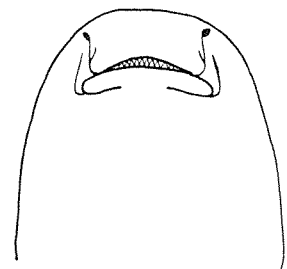
FAO: En - Shorttail nurse shark  
Fr - Requin-nourrice à queue courte  
Sp - Gata riodriza rabcorta

NATIONAL:

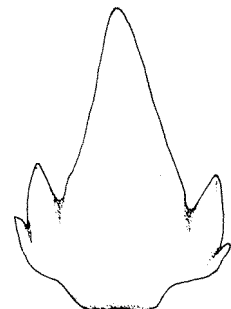
## DISTINCTIVE CHARACTERS:

A small, relatively stout-bodied shark with a short precaudal tail. Head with 5 moderate gill slits, the last 2 behind pectoral fin origin and very close to each other; no gillrakers; nostrils close to front of snout, with minute barbels and nasal grooves connecting them with the mouth; no nictitating lower eyelids; snout very short, broad and very broadly rounded; mouth nearly transverse and far forward on head, well in front of eyes; teeth small, weakly differentiated in different regions of the mouth, not compressed, with long medial cusps and very short cusplets on sides. Two dorsal fins, both with rounded apices, the origin of the first about over the pelvic midbases and its insertion well behind the pelvic fin insertions; second dorsal about as large as first; anal fin present, high and with an angular apex, and with its origin about under or slightly behind the origin of the second dorsal fin; caudal fin about 1/5 of total length, strongly asymmetrical, with a strong subterminal notch but with ventral lobe hardly developed. Caudal peduncle not strongly depressed, without lateral keels or precaudal pits; no dermal ridges on sides of body. Intestinal valve of ring type.

Colour: no colour pattern, dark brown above, lighter below.



underside of head

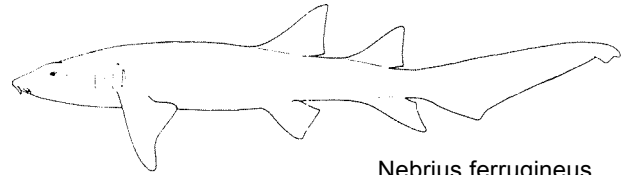


lower tooth

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Nebrius ferrugineus: nasal barbels longer; teeth with now cusps and higher cusplets, more strongly compressed; origin of first dorsal fin about opposite pelvic fin origins; fins angular; caudal fin about 1/3 of total length.

Chiloscyllium species: small sharks with large spiracles, extremely long precaudal tails, and broadly rounded, low, keel-shaped anal fins.



Nebrius ferrugineus

**SIZE:**

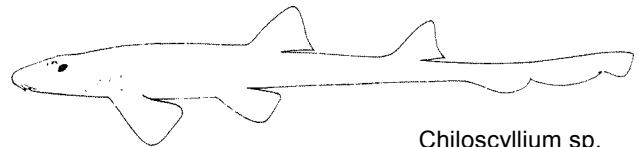
Maximum: about 75 cm (adult male), males adolescent at about 59 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Confined to the Western Indian Ocean, off Tanzania, Kenya, Mauritius and possibly Seychelles. Not known from Madagascar at present.

A sluggish, bottom-dwelling, shallow-water shark, common off East Africa. Mode of reproduction unknown.

Feeding habits unknown, but probably small fishes and bottom invertebrates.



Chiloscyllium sp.

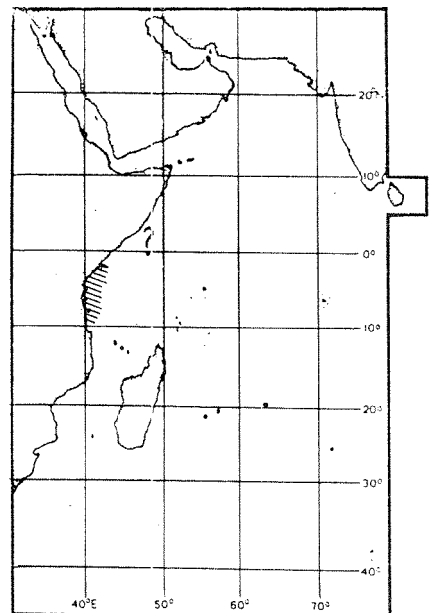
**PRESENT FISHING GROUNDS:**

Uncertain at present, presumably taken off East Africa.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Gear and utilization uncertain.





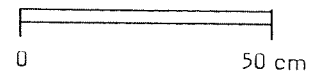
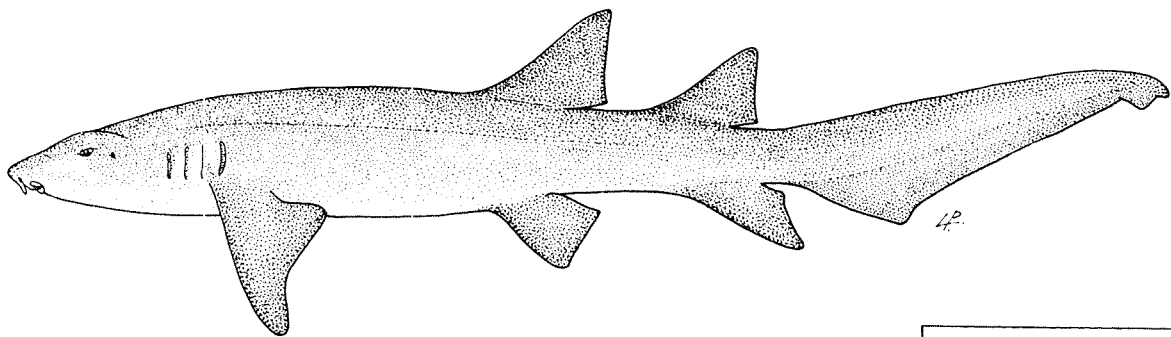
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: GINGLYMOSTOMATIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Nebrius ferrugineus</i> (Lesson, 1830)
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## OTHER SCIENTIFIC NAMES STILL IN USE:

*Nebrius concolor* Rüppell, 1837*Ginglymostoma ferrugineum* (Lesson, 1830)*Nebrius doldi* Smith, 1953

## VERNACULAR NAMES:

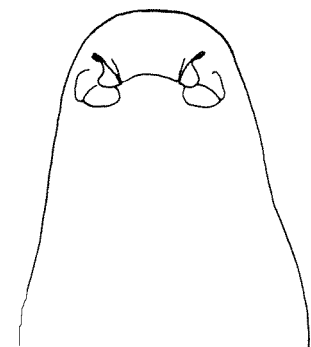
FAO :           En - Tawny nurse shark  
                  Fr - Requin-nourrice fauve  
                  SF - Gata nodriza atezada

NATIONAL:

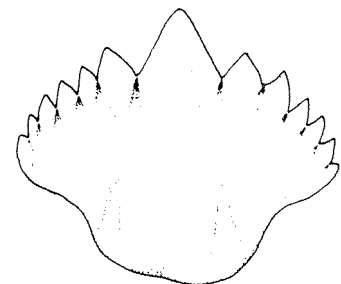
## DISTINCTIVE CHARACTERS:

A large, relatively stout-bodied shark with a short precaudal tail. Head with 5 moderate gill slits, the last two behind pectoral origin and very close to each other; no gillrakers; nostrils close to front of snout, with short barbels and nasoral grooves connecting them with the mouth; no nictitating lower eyelids; snout very short, broad and very broadly rounded or truncated; mouth nearly transverse and far forward on head, well in front of eyes; teeth small, weakly differentiated in different regions of the mouth, somewhat compressed, with short medial cusps and short cusplets on sides. Two dorsal fins, both with angular apices, the origin of the first about over the pelvic origins and its insertion slightly behind the pelvic insertions; second dorsal slightly smaller than first; anal fin present, high and with an angular apex, and with its origin about under the midbase of the second dorsal fin; caudal fin about 1/3 of total length, strongly asymmetrical, with a: strong subterminal notch but with ventral lobe weak to short. Caudal peduncle not strongly depressed, without lateral keels or precaudal pits; no dermal ridges on sides of body. Intestinal valve of ring type.

Colour: no colour pattern, tan above, lighter below, fins slightly dusky.



underside of head

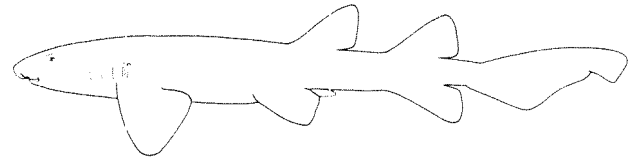


lower tooth

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Ginglymostoma brevicaudatum: nasal barbels smaller; teeth with high, narrow cusps and short cusplets; origin of first dorsal fin behind pelvic origins; fins broadly rounded; caudal fin less than 1/4 of total length.

Chiloscyllium spp.: small sharks with large spiracles, extremely long precaudal tails, broadly rounded, low keel-shaped anal fins.



Ginglymostoma brevicaudatum

## SIZE:

Maximum: reported to reach about 320 cm; common to 250 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, from South Africa and Madagascar to Red Sea and India, also Mauritius and Seychelles. Elsewhere, in the Eastern Indian Ocean and Western Pacific eastward to Taiwan Island, Australia and Tahiti.

A sluggish, nocturnal shallow-water bottom shark common on coral and rocky reefs, in lagoons and on sand flats, at depths from the intertidal zone to at least 70 m. Ovoviviparous, size at birth about 40 cm.

Feeds on a wide variety of bottom invertebrates and small fishes, including sea urchins, corals, crabs, octopi and squid; capable of capturing small reef fishes with its powerful suction feeding mechanism.

## PRESENT FISHING GROUNDS:

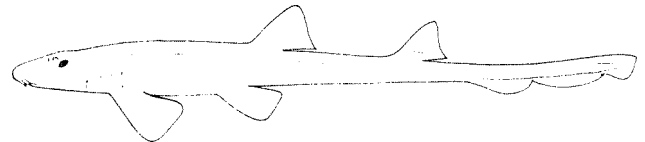
Pakistan, India, Red Sea.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

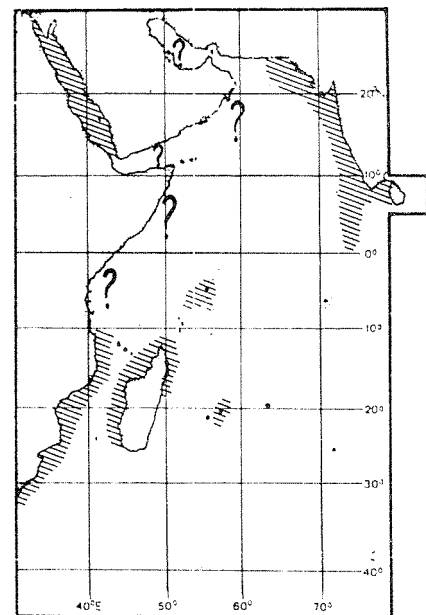
Separate statistics are not reported for this species.

Caught with gillnets and line gear.

Utilized fresh and dried-salted for human consumption: livers rendered for oil: fins for the oriental sharkfin trade: and offal for fishmeal.



Chiloscyllium spp.



## FAO SPECIES IDENTIFICATION SHEETS

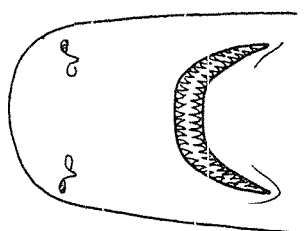
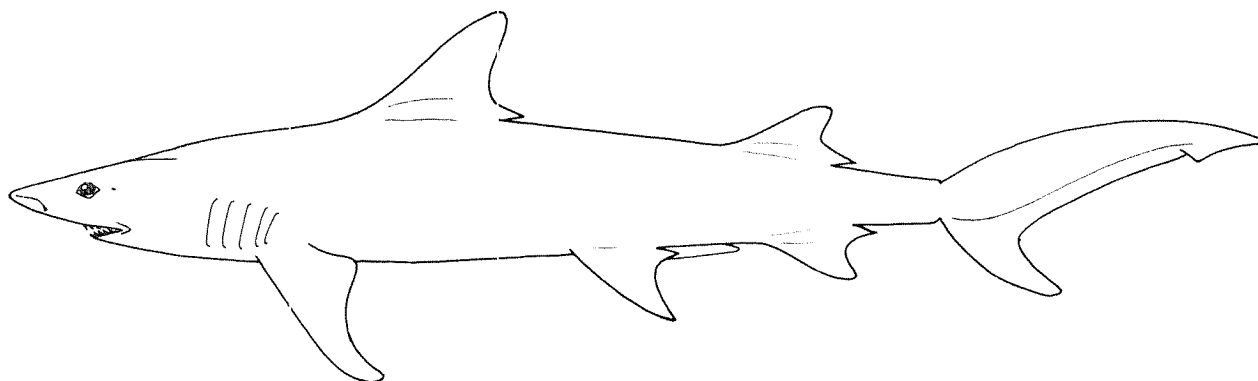
FISHING AREA 51  
(W. Indian Ocean)

## HEMIGALEIDAE

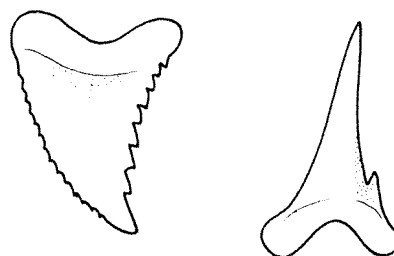
## Weasel sharks

Small to medium-sized sharks. Trunk and precaudal tail cylindrical, not depressed and without lateral ridges; precaudal tail much shorter than trunk. Head not expanded laterally, moderately depressed; 5 small to medium-sized gill slits present, the last 2 or 3 over or behind pectoral fin origins, their upper ends expanded partway onto upper surface of head in some species; no gill sieves or gillrakers; spiracles minute, and behind but not below eyes; nostrils without barbels, rasoral grooves, or circumnarial grooves, well-separated from mouth; eyes on sides of head, with a well-developed nictitating lower eyelid; snout moderately long, depressed, and parabolic to broadly rounded, not greatly flattened and bladeliike and without lateral teeth and barbels; mouth moderately large, arched and elongated, and extending well behind eyes; labial furrows present on both jaws and moderately large, reaching front of mouth or ending well behind it; teeth small to large, bladeliike, and with a single cusp on teeth of both jaws, cusplets or strong serrations present on upper teeth, and cusplets variably present or absent on lower teeth; anterior teeth in upper jaw smaller than lateral teeth and not separated from them by smaller intermediate teeth on each side. Two dorsal fins without spines, the first dorsal fin moderately large, high and angular or subangular, much shorter than the caudal fin, with its base located over the interspace between the pectoral and pelvic fin bases and entirely anterior to origins of pelvic fins; second dorsal fin moderately large, about 2/3 the size of first dorsal; anal fin moderately large, slightly smaller than second dorsal, with its origin slightly behind second dorsal fin origin but in front of second dorsal midbase; caudal fin strongly asymmetrical, much less than half of total length, with a rippled or undulated dorsal margin, a well-marked subterminal notch, and a short, but well-defined lower lobe; vertebral axis of caudal fin raised above body axis. Caudal peduncle cylindrical, without keels but with well-developed precaudal pits. Intestinal valve of spiral type.

Colour: grey, grey-brown or dark grey; above, white or cream below, fins sometimes with dusky tips or white posterior margins; sometimes a few white spots but no elaborate colour pattern.



underside of head



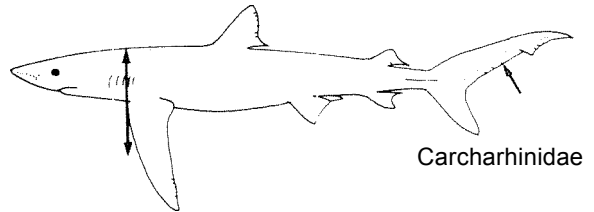
upper and lower teeth

The Hemigaleidae is a small family of small to medium-sized, coastal sharks with a primary diversity (about 5 species) in the continental and insular tropical waters of the Indo-West Pacific (but not extending into the Central Pacific); a single additional species occurs in the Atlantic. It is closely related to the large family Carcharhinidae. These sharks feed on small fishes, octopi, and probably other invertebrates, and are not known to have attacked people. All species in the area are fished for human consumption, but due to their modest abundance they form only a small fraction of the shark catch in the area.

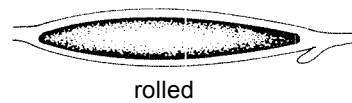
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Carcharhinidae: intestine with a scroll valve; also, no carcharhinids in the area show the character combination of long snout, spiracles, upper teeth with cusplets, lower teeth well-differentiated from uppers, long labial furrows, and second dorsal fin about 2/3 as large as first dorsal and with its origin anterior to that of the slightly smaller anal fin.

Proscylliidae and Triakidae: no precaudal pits or undulated dorsal caudal margin, teeth not strongly differentiated in upper and lower jaws, spiracles usually larger.



Carcharhinidae



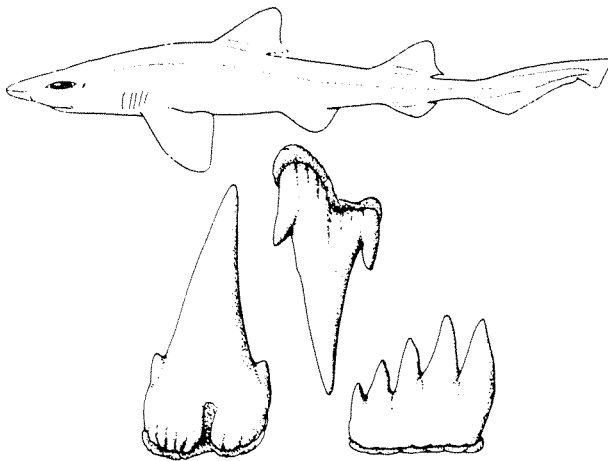
rolled



unrolled  
scroll valve (diagrammatic)  
Carcharhinidae



Hemigaleidae and many other families

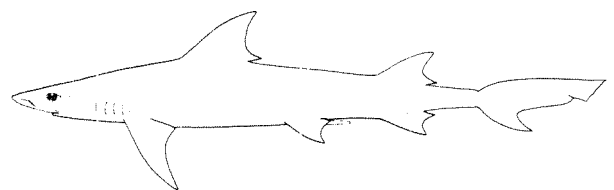


upper and lower teeth

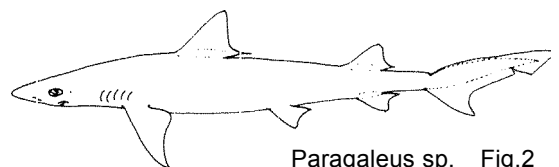
Proscylliidae

**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

- 1a. Lower teeth near symphysis with short, straight or weakly hooked cusps that are concealed or barely protrude when mouth is closed (Fig.5a,b); gill slits small, less than twice the eye length (Figs.1,2)
- 2a. Lower teeth near symphysis with erect cusps and arched roots, giving them an inverted Y shape; no cusplets on lower teeth; mouth very short, broadly arched (Fig.5a); pelvic fins, both dorsal fins, and ventral caudal fin lobe strongly falcate (Fig.1) ..... Hemigaleus microstoma
- 2b. Lower teeth near symphysis with semi-erect cusps and straight roots, giving them an inverted T shape; cusplets present on lower teeth; mouth longer, narrowly arched (Fig.5b); pelvic, dorsal and caudal fins not falcate (Fig.2) ... Paragaleus sp.



Hemigaleus microstoma Fig.1

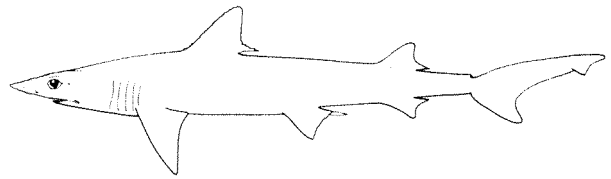


Paragaleus sp. Fig.2

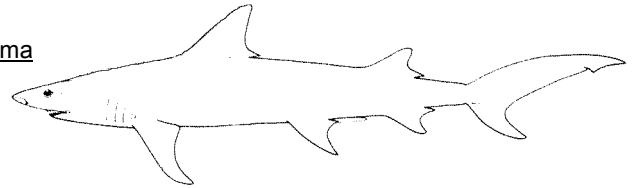
1b. Lower teeth near symphysis with long, strongly hooked cusps that prominently protrude from mouth when it is closed (Fig.5c,d); gill slits large, over twice the eye length

3a. Snout obtusely wedge-shaped in dorsoventral view; teeth present at symphysis of lower jaw; mesial edges of upper teeth smooth at all sizes (Fig.5c); fins not falcate, posterior margins of pelvic and pectoral fins straight or slightly concave (Fig.3) ..... Chaenogaleus macrostoma

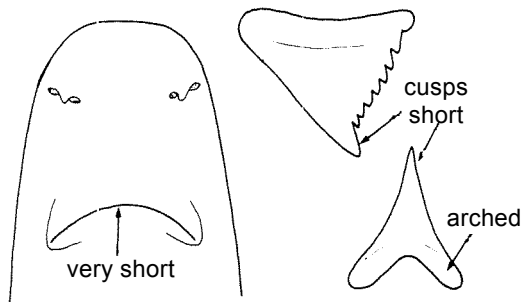
3b. Snout bluntly rounded in dorsoventral view; teeth absent at symphysis of lower jaw; mesial edges of upper teeth serrated (but smooth in young below 60 cm) (Fig. 5d); fins strongly falcate, posterior margins of pelvic and pectoral fins deeply concave (Fig.4) ..... Hemipristis elongatus



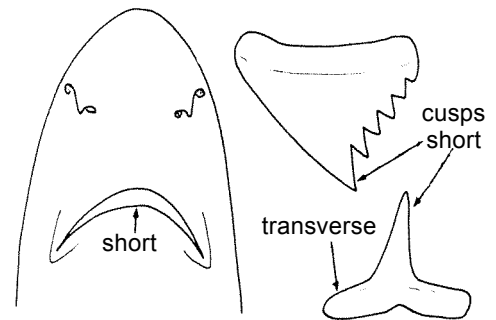
Chaenogaleus macrostoma Fig.3



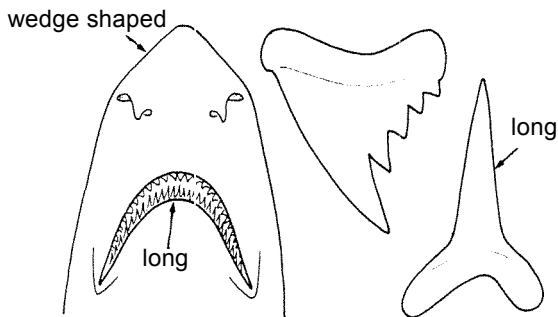
Hemipristis elongatus Fig.4



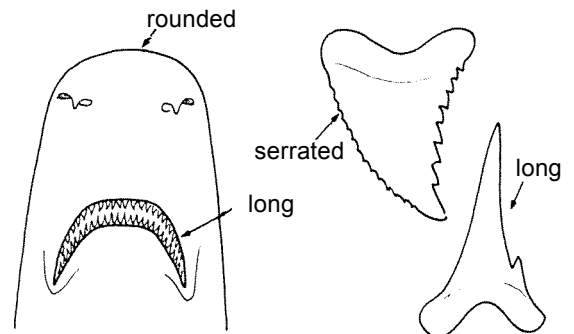
a) Hemigaleus microstoma



b) Paragaleus sp.



c) Chaenogaleus macrostoma



d) Hemipristis elongatus

underside of head and teeth

Fig.5

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

* <u>Chaenogaleus macrostoma</u> (Bleeker, 1852)	HEMIG Chaen 1
** <u>Hemigaleus microstoma</u> Bleeker, 1852	HEMIG Hemig 1
*** <u>Hemipristis elongatus</u> (Klunzinger, 1871)	HEMIG Hemip 1
**** <u>Paragaleus</u> sp.	

Prepared by L.J.V. Compagno, Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, California, USA

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\*Including Hemigaleus balfouri Day, 1878

\*\*Not previously reported from the area, but specimens examined by the writer from India and Sri Lanka

\*\*\*Including Heterogaleus ghardaquensis Gohar & Mazhar, 1964

\*\*\*\*An undescribed species of Paragaleus, to be named by the author, occurs in the Arabian Sea south to southeastern India and probably Sri Lanka, and possibly off Madagascar (where it was ascribed to the Atlantic Paragaleus, P. pectoralis). It is taken in the Indian shark fishery and marketed fresh for human consumption

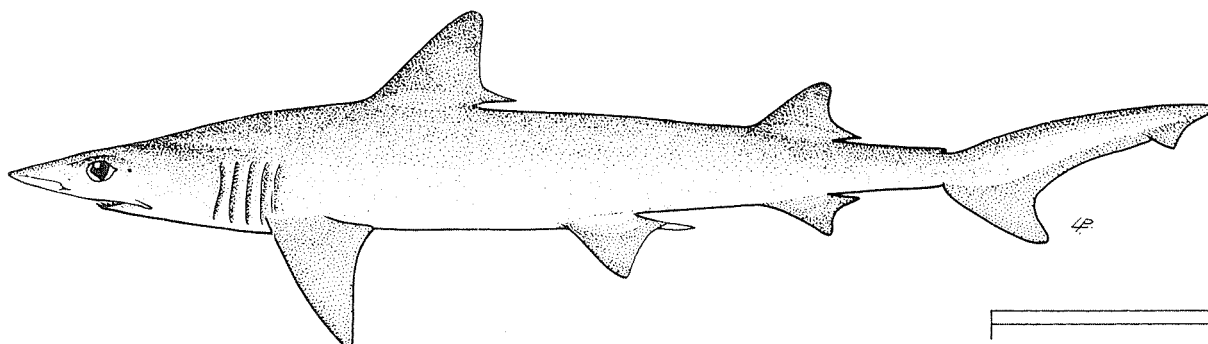
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEMIGALEIDAE:

FISHING AREA 51  
(W. Indian Ocean)

Chaenogaleus macrostoma (Bleeker, 1852)

OTHER SCIENTIFIC NAMES STILL IN USE : Hemigaleus macrostoma Bleeker, 1852  
Hemigaleus balfouri Day, 1878



VERNACULAR NAMES:

- FAO : En - Hooktooth shark
- Fr - Milandre harpon
- Sp - Comadreja ganchuda

NATIONAL:

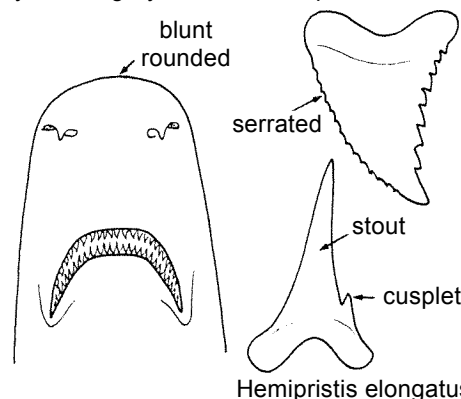
DISTINCTIVE CHARACTERS:

A small shark. Body moderately slender; snout long, its length slightly greater than mouth width, obtusely wedge-shaped toward tip; labial furrows moderately long and easily seen, the uppers ending well behind symphysis of lower jaw; anterior nasal flaps with a short, broad, triangular lobe; mouth long and parabolic, its length over 2/3 of the width; spiracles small; gill slits very long, the longest over twice the eye length; teeth in upper jaw with narrow, erect to oblique, high cusps and distal cusplets except for those at symphysis, entirely smooth-edged; teeth in lower jaw with arched roots and long, hooked, slender, mostly erect cusps that prominently protrude when mouth is closed, without cusplets or serrations. First dorsal fin moderately large, with a pointed or narrowly rounded apex and short inner margin, its origin slightly posterior to free rear tips of pectorals and the free rear tip anterior to pelvic fin origins; second dorsal fin high, about 2/3 of length of first, with a short inner margin less than fin height, and its origin slightly anterior to anal fin origin; pectoral and pelvic fins with straight or slightly concave inner margins; anal fin slightly smaller than second dorsal fin, without long preanal ridges; upper precaudal pit transverse and crescentic, no. keels on caudal peduncle. Intestine with a spiral valve.

Colour: bronzy-grey above, white below when fresh, fading to greyish or greyish-brown in preservation, dorsal fins often with dusky or black tips.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Hemipristis elongatus: snout bluntly rounded toward tip; upper teeth more triangular with serrated, more curved mesial margins (except in young below 60 cm); lower teeth with stouter cusps, basal cusplets and partial serrations; pectoral and pelvic fins strongly falcate, with deeply concave posterior margins.



Hemigaleus microstoma: snout tip broadly rounded, upper labial furrows nearly reaching lower symphysis; longest gill openings less than twice the eye length; mouth very short and arcuate; teeth in upper jaw with very short cusps; lower teeth very small, with short, erect cusps that do not protrude when mouth is closed; dorsal fins more falcate, pectoral and pelvic fins strongly falcate, with deeply concave posterior margins, dorsal fins with white edges; often white spots on body.

Paragaleus species: mouth shorter and less narrowly arched; upper labial furrows nearly reaching lower symphysis; teeth in upper jaw with moderately long cusps; lower teeth smaller, with transverse roots and distal cusplets, cusps not or hardly protruding when mouth is closed; pectoral fins slightly more falcate; 2 dark lines on underside of snout tip.

Small species of the family Carcharhinidae: intestine valve of scroll type; also, no small carcharhinid combines the characters of long snout, spiracles, upper teeth smooth-edged but with distal cusplets, lower teeth strongly hooked and prominently protruding, long labial furrows, and second dorsal fin about 2/3 of size of first dorsal fin and with its origin anterior to that of the slightly smaller anal fin.

#### SIZE:

Maximum: reported about 100 cm.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, restricted to the northeast, from the "Gulf" to Pakistan, India and probably Sri Lanka. Elsewhere in the Eastern Indian Ocean and the Western Central Pacific extending eastward to Thailand, Taiwan Island and Indonesia.

A small, common, coastal, inshore and offshore shark of continental waters. Viviparous, number of young 4; size at birth 20 cm.

Probably eats small fishes and invertebrates; harmless to people.

#### PRESENT FISHING GROUNDS:

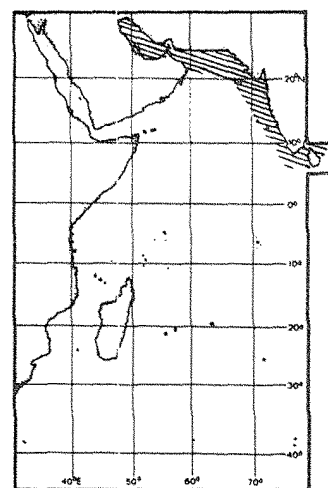
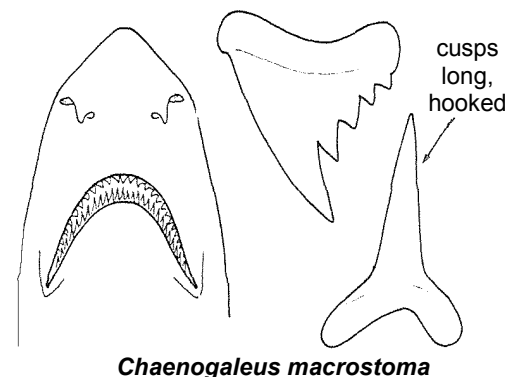
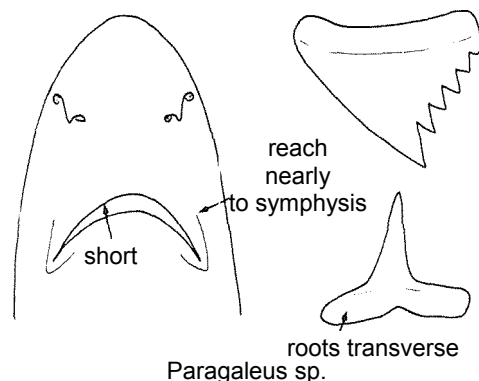
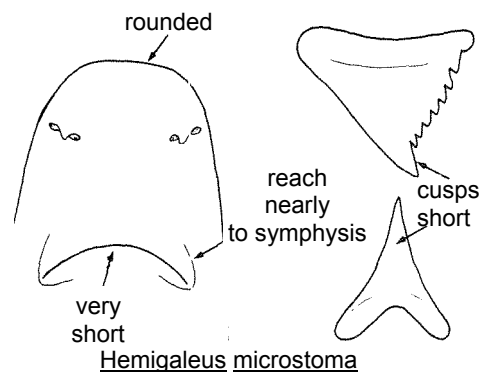
Off Pakistan, India and Sri Lanka.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught in drifting and bottom gillnets and on longlines and other line gear.

Utilized fresh for human consumption; offal processed into fishmeal.





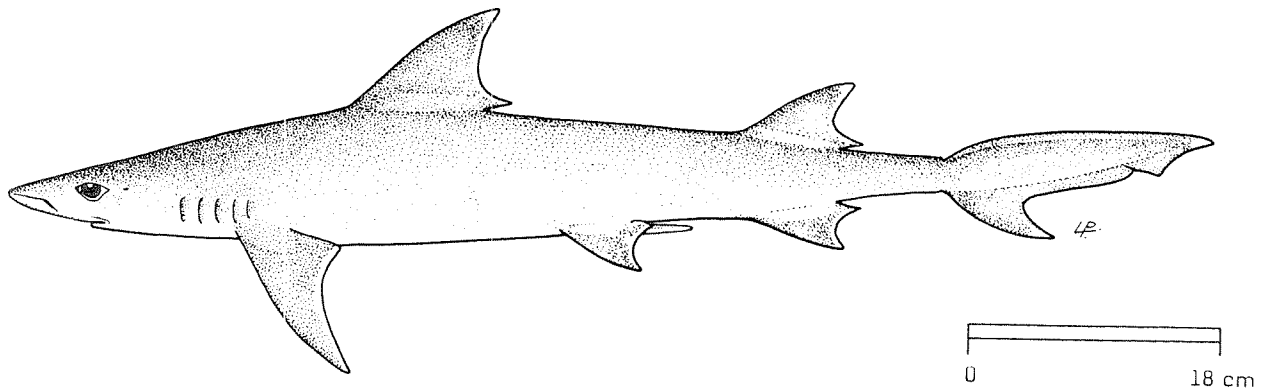
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEMIGALEIDAE

FISHING AREA 51  
(W. Indian Ocean)

Hemigaleus microstoma Bleeker, 1852

OTHER SCIENTIFIC NAMES STILL IN USE: Negogaleus microstoma (Bleeker, 1852)



VERNACULAR NAMES:

- FAO : En - Sicklefins weasel shark
- Fr - Milandre faucille
- Sp - Comadreja segadora

NATIONAL:

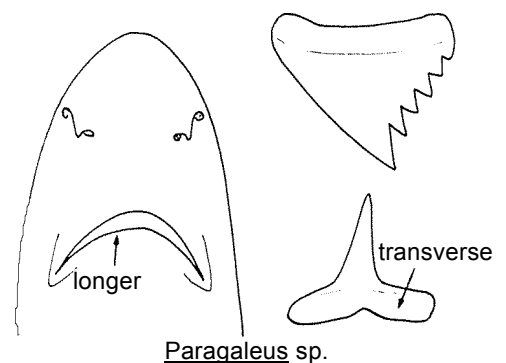
DISTINCTIVE CHARACTERS:

A small shark. Body moderately slender; snout long, its length somewhat greater than mouth width, parabolic toward tip; labial furrows moderately long and easily seen, the uppers nearly reaching symphysis of lower jaw; anterior nasal flaps with a short, broad, triangular lobe; mouth very short and broadly arched, its length about 1/3 of the width; spiracles present, small; gill openings short, the longest slightly longer than eye length in adults, slightly shorter in young; teeth in upper jaw with very narrow, short, oblique cusps and prominent distal cusplets (except for those at symphysis), entirely smooth-edged; teeth in lower jaw very small, with arched roots and short, mostly erect, slender, straight cusps that do not protrude when mouth is closed, and no cusplets or serrations. First dorsal fin moderately large, with a pointed apex and short inner margin, its origin slightly posterior to free rear tips of pectorals and the free rear tip anterior to pelvic fin origins; second dorsal fin high, about 2/3 of length of first dorsal, with a short inner margin less than fin height, and its origin slightly anterior to anal fin origin; pectoral and pelvic fins strongly falcate, with deeply concave posterior margins; anal fin slightly smaller than second dorsal fin, without long preanal ridges; upper precaudal pit transverse and crescentic, no keels on caudal peduncle. Intestine with a spiral valve.

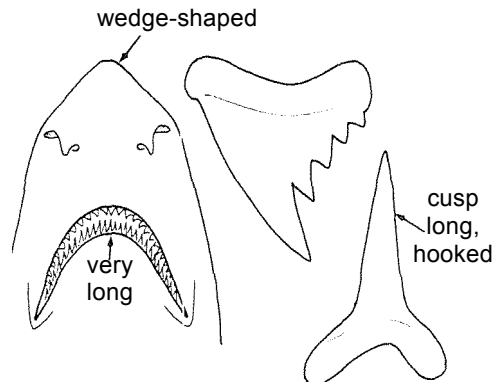
Colour: grey-brown above, lighter below, dorsal fins with white tips and posterior margins; sometimes white spots on sides of body.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Paragaleus species: mouth somewhat longer; teeth in upper jaw with longer cusps, those in lower jaw with transverse roots and some distal cusplets; fins less falcate; no white spots and white posterior margins on fins; 2 dark lines on underside of snout tip.

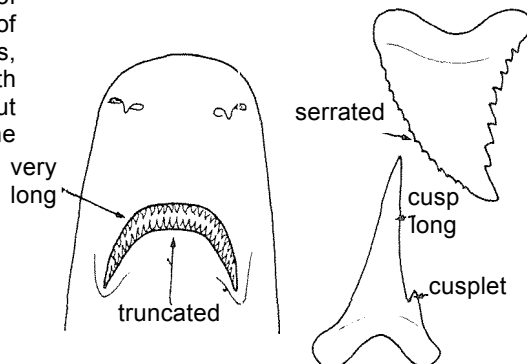


Chaenogaleus macrostoma: snout tip obtusely wedge-shaped; upper labial furrows ending far behind symphysis of mouth; longest gill openings over twice the eye length; mouth very long and parabolic; teeth in both jaws with long cusps, those of lower teeth hooked and strongly protruding when mouth is closed; fins hardly falcate, without white posterior margins; dorsal fins usually with dusky tips; no white spots on body.



Chaenogaleus macrostoma

Hemipristis elongatus: upper labial furrows ending far behind symphysis of mouth; longest gill openings over twice the eye length; mouth long and parabolic, with a truncated lower symphysis; teeth of both jaws with long cusps, those in upper jaw curved distally and with a serrated mesial margin; those in lower jaw strongly protruding when mouth is closed, and with basal cusplets and serrations on some teeth; fins without white posterior margins; no spots on body.



Hemipristis elongatus

**SIZE:**

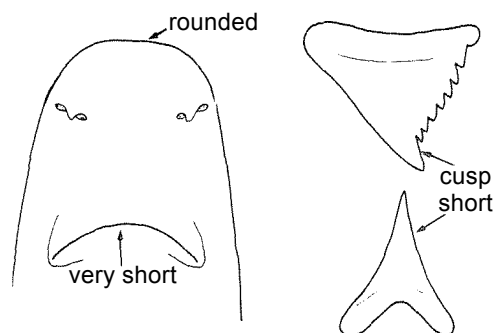
Maximum: at least 91 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, known only from southern India and Sri Lanka. Elsewhere, in the Eastern Indian Ocean and Western Central Pacific, ranging eastward to China, Japan, Thailand, Indonesia and Australia.

A small coastal, inshore and offshore shark of continental tropical waters. Viviparous, 2 fetuses in a litter.

Feeds on small fish and cephalopods. Harmless to humans.



Hemigaleus microstoma

**PRESENT FISHING GROUNDS:**

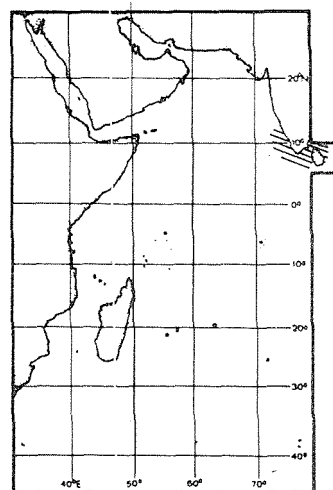
Off southern India and Sri Lanka.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

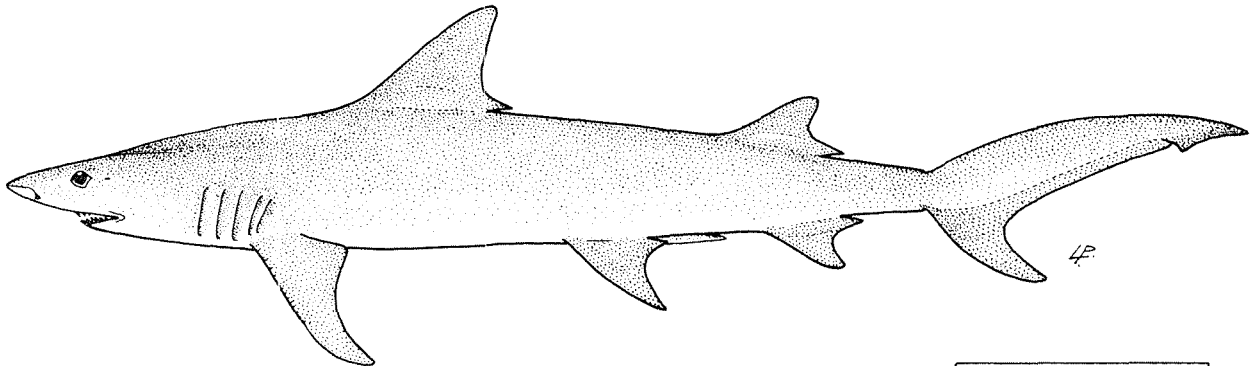
Caught with floating and bottom gillnets, longlines and hook and line.

Utilized fresh for human consumption; offal used for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEMIGALEIDAE

FISHING AREA 51  
(W. Indian Ocean)Hemipristis elongatus (Klunzinger, 1871)OTHER SCIENTIFIC NAMES STILL IN USE: Carcharhinus elliotti (Day, 1878)

## VERNACULAR NAMES:

FAO: En - Snaggletooth shark  
Fr - Milandre chicor  
Sp - Comadreja sobrediente

NATIONAL:

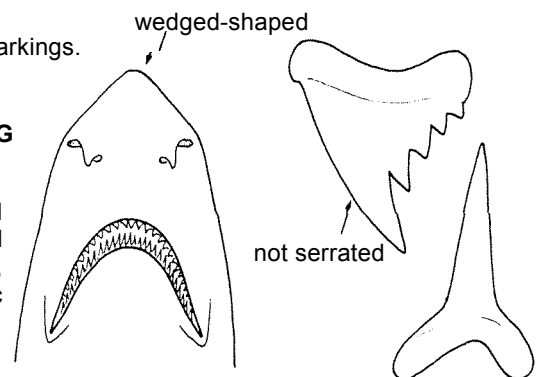
## DISTINCTIVE CHARACTERS:

A medium-sized shark. Body moderately slender; snout long, slightly greater than mouth width, bluntly rounded toward tip; labial furrows moderately long and easily seen, the uppers falling well behind symphysis of lower jaw; anterior nasal flaps with a short triangular lobe; mouth long and semiparabolic, with a truncated lower symphysis, its length about 2/3 of the width; spiracles small; gill openings long, the longest over twice the eye length; teeth in upper jaw with strong, distally curved, broad and oblique cusps (except for erect-cusped symphyseal teeth), prominent distal cusplets and mesial serrations; teeth in lower jaw large but considerably narrower than uppers, with arched roots and long, strong, hooked, erect to oblique cusps that prominently protrude when mouth is closed, and basal serrations or small cusplets on more distal teeth. First dorsal fin moderately large, with a pointed apex and short inner margin, its origin slightly posterior to free rear tips of pectorals and the free rear tip anterior to pelvic fin origins; second dorsal fin high, about 2/3 of length of first, with a short inner margin less than fin height and its origin somewhat anterior to anal fin origin; pectoral and pelvic fins strongly falcate, with deeply concave posterior margins; anal fin slightly smaller than second dorsal fin, without long preanal ridges; upper precaudal pit transverse and crescentic; no keels on caudal peduncle. Intestine with a spiral valve.

Colour: grey or grey-brown above, lighter below, no prominent markings.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Chaenogaleus macrostoma: snout obtusely wedge-shaped toward tip; mouth with lower symphysis more rounded; upper and lower teeth with slender cusps, the uppers without mesial serrations, the lowers without serrations or cusplets; dorsal, pectoral and pelvic fins less falcate, with less concave posterior edges.

Chaenogaleus macrostoma

Hemigaleus microstoma and Paragaleus species: upper labial furrows nearly reaching symphysis of lower jaw; mouth short to very short and moderately to broadly arched, without a truncate lower symphysis; gill openings shorter, the longest less than twice the eye length; teeth with narrow cusps and no serrations in upper jaw, short-cusped, not hooked, and not protruding when mouth is closed.

The combination of moderately long labial furrows, long snout with a bluntly rounded tip, nictitating eyelids, small spiracles, long, large mouth with characteristic teeth protruding from it, first dorsal fin over interspace between pectoral and pelvic fins, strongly falcate fins, precaudal pits, absence of caudal keels, and intestinal valve of spiral type distinguishes this shark from all others in the area.

**SIZE:**

Maximum: reported about 218 to 240 cm, most adults below 200 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, scattered records from South Africa, Mozambique, Tanzania, Madagascar, the Red Sea and India. Elsewhere, in the Eastern Indian Ocean/Western Central Pacific, ranging eastward to Thailand, Vietnam, China and Australia.

A coastal, inshore, to offshore, tropical shark, common off India but otherwise rather rare in the area. Viviparous, number of young 6 to 8 per litter; size at birth about 45 cm.

Feeds on inshore pelagic and bottom fishes, including mackerel, other sharks, and rays. Not recorded as being involved in attacks on people, but regarded as potentially dangerous because of its size and large, formidable teeth.

**PRESENT FISHING GROUNDS:**

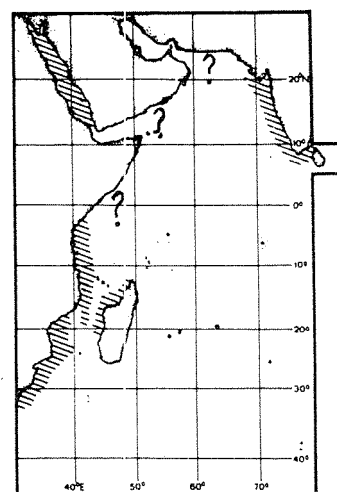
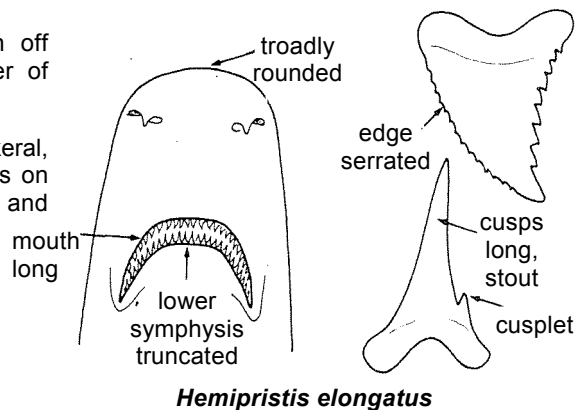
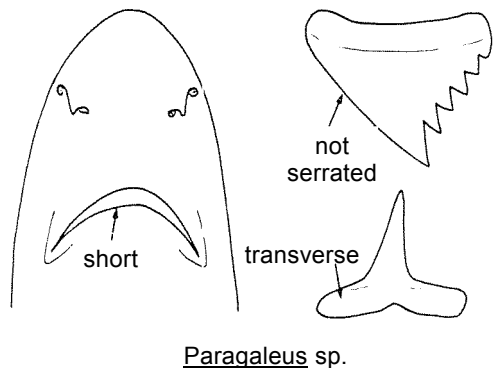
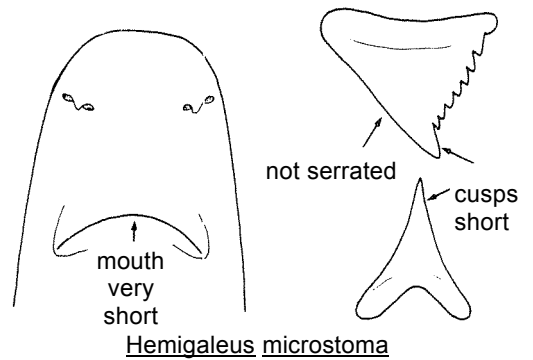
Off India, inshore and offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with floating and fixed bottom gillnets, floating long-lines and probably on hook and line.

Utilized fresh for human consumption, and considered one of the best sharks for this purpose; liver processed for vitamins; fins used in the oriental sharkfin trade; and offal for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

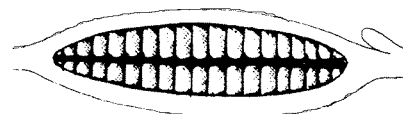
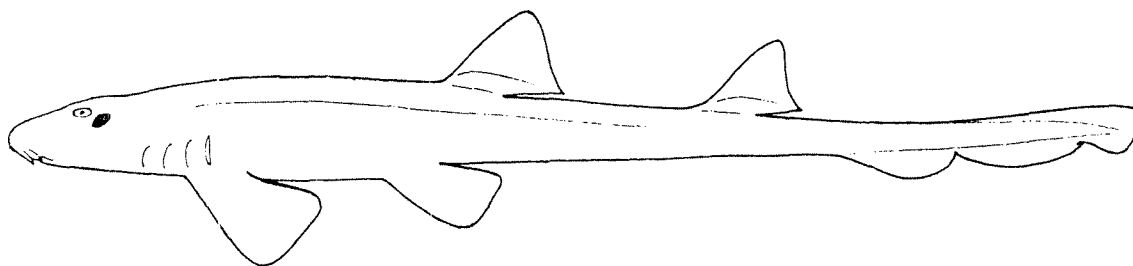
## HEMISCYLLIIDAE

## Longtail carpetsharks

Small sharks. Trunk cylindrical or moderately depressed, precaudal tail cylindrical and somewhat longer than trunk, lateral ridges on sides of trunk and tail present or absent. Head not expanded laterally, cylindrical or moderately depressed; 5 small gill slits present, the last 3 over the pectoral fin base, their upper ends not expanded onto upper surface of head; no gill sieves or rakers on internal gill slits; spiracles very large and located behind and below eyes; nostrils with barbels, nasoral grooves, and circumnarial grooves, close in front of mouth; eyes above and medial to sides of head, without nictitating eyelids; snout short to moderately long, slightly depressed, parabolic to broadly rounded, not greatly flattened and bladelike and without lateral teeth or barbels; mouth small, nearly transverse, and well in front of eyes; labial furrows present on both jaws and relatively large, with upper furrows extending in front of mouth; teeth small, not bladelike, with a single cusp on upper and lower teeth and with cusplets small or absent; teeth similar in upper and lower jaws, not differentiated into medials, anteriors, intermediates, laterals or posteriors. Two dorsal fins without spines, the first moderate-sized, sub-angular, much shorter than the caudal fin, and with its origin over or behind the pelvic fin bases; second dorsal fin about as large as the first and of similar shape; anal fin moderately large, very low, broad and rounded, with its origin well behind the second dorsal base and its base separated by a notch from the caudal fin; caudal fin strongly asymmetrical, much less than half of total length, without a rippled dorsal margin or lower lobe but with a strong subterminal notch; vertebral axis of caudal fin hardly raised above body axis. Caudal peduncle cylindrical, without precaudal pits or keels. Intestinal valve of ring type.

Colour: back yellowish, brownish or grey-brown, lighter below, with dark or light spots or dark saddles, sometimes absent in adults.

Longtail carpetsharks are a small group of inshore tropical sharks of the Indian Ocean and Western Pacific, being confined to continental waters and continental islands. They are slow-swimming bottom-dwellers, often clambering with their muscular paired fins on coral and rocky reefs. They feed on invertebrates and small fishes, and are harmless to people. They are commonly caught and utilized for food, but are of minor importance to fisheries. Although often collected, members of this family are poorly known taxonomically, and the arrangement of species adopted here for species reported from the area is extremely tentative.

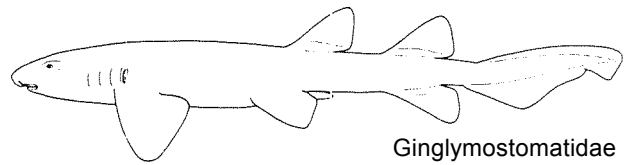


intestinal valve  
of ring type  
(diagrammatic)

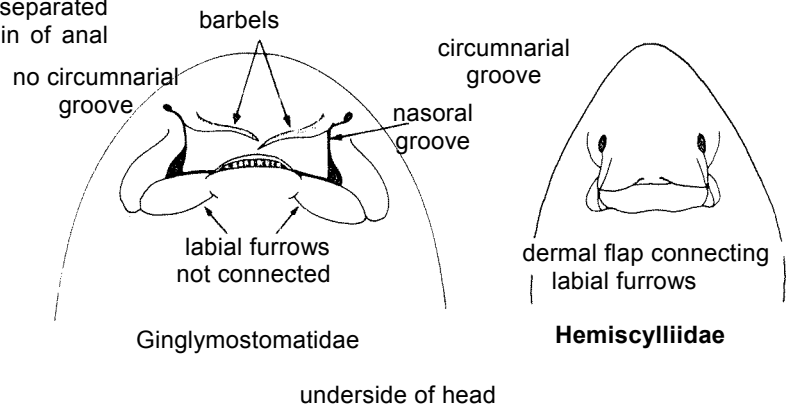
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Ginglymostomatidae: precaudal tail not greatly elongated, shorter than head and body; no circumnarial grooves around nostrils; head more depressed and flattened; spiracles minute; labial furrows not connected across chin by a dermal flap (this is present in Hemiscylliidae); anal fin higher, more angular, and separated from the lower caudal fin origin by a space; origin of anal fin under second dorsal fin base.

Stegostomatidae: precaudal tail not greatly elongated, shorter than head and body; no circumnarial grooves around nostrils, labial furrows not connected across chin by a dermal flap; first dorsal origin far anterior to pelvic fin bases, its insertion over or slightly anterior to pelvic fin insertions (far posterior to pelvic insertions in Hemiscylliidae), second dorsal fin much smaller than first dorsal; pelvic fins much smaller than pectoral fins, anal fin origin under second dorsal fin base, and caudal fin about as long as rest of shark.



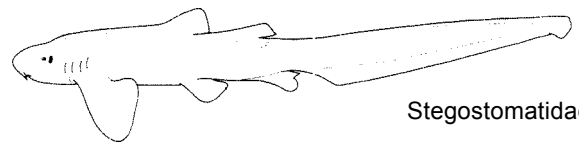
Ginglymostomatidae



Ginglymostomatidae

Hemiscylliidae

underside of head

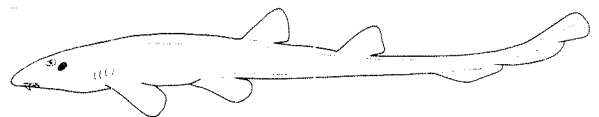


Stegostomatidae

**KEY TO SPECIES OCCURRING IN THE AREA\*:**

1a. Body and tail very slender; colour pattern with numerous small dark spots and bars (Fig.1) ..... Chiloscyllium indicum

1 b. Body and tail moderately stout; colour pattern variable, either with numerous small light spots on dark background or with sparse dark spots and transverse bands; or with spots and bands

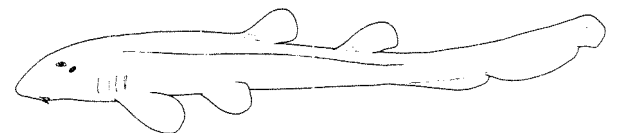


Chiloscyllium indicum

Fig.1

2a. Ground colour of body dark with numerous light spots

3a. Dorsal fins small and rounded, snout rounded; transverse dark saddles broad and prominent, spots white (Fig.2) .... Chiloscyllium plagiosum

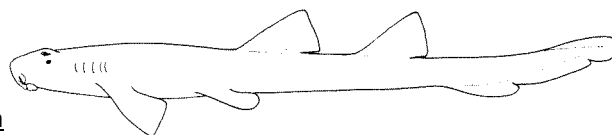


Chiloscyllium plagiosum

Fig.2

\* Key also includes the extralimital C. punctatum and C. plagiosum, which are known from east of the area and may eventually occur within it

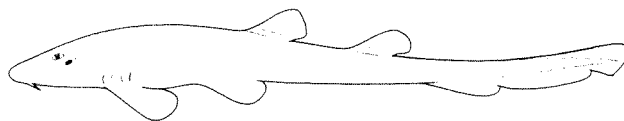
- 3b. Dorsal fins larger and angular, snout truncated anteriorly; transverse dark saddles hardly indicated, spots blue (Fig.3) ..... Chiloscyllium caerulopunctatum



Chiloscyllium caerulopunctatum Fig.3

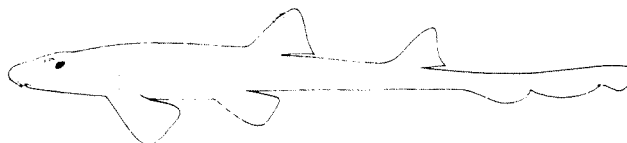
- 2b. Ground colour of body light without light spots, with or without dark transverse spots or bands

- 4a. Dorsal fins smaller than pelvic fins, dorsals without projecting free rear tips (Fig.4) ..... Chiloscyllium griseum



Chiloscyllium griseum Fig.4

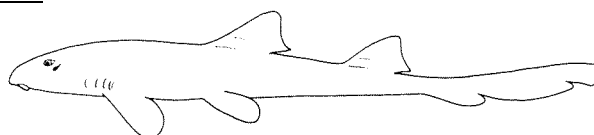
- 4b. Dorsal fins larger than pelvic fins, dorsals with projecting free rear tips (Figs 5,6)



Chiloscyllium arabicum Fig.5

- 5a. A lateral ridge present on each side\*; first dorsal fin origin behind pelvic fin bases\*\* (Fig.5); young without stripes and spots ... Chiloscyllium arabicum

- 5b No lateral ridges on sides; first dorsal origin over anterior half of pelvic bases (Fig.6); young with saddle markings and a few scattered dark spots ..... Chiloscyllium punctatum



Chiloscyllium punctatum Fig.6

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Chiloscyllium arabicum Gubanov in Gubanov & Shleib, 1980

\*\*Chiloscyllium caerulopunctatum Pelegrin, 1914

Chiloscyllium griseum Müller & Henle, 1839

Chiloscyllium indicum (Gmelin, 1789)

\*\*\*\*?Chiloscyllium plagiosum (Bennett, 1830)

\*\*\*\*?Chiloscyllium punctatum Müller & Henle, 1839

REMIS Chilo 1

REMIS Chilo 2

Prepared by L.J.V. Compagno, Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, California, USA

\*Lateral ridges present in C. indicum, C. punctatum and C. caerulopunctatum

\*\*Also posterior to pelvic bases in C. indicum

\*\*\*Usually synonymized with C. plagiosum, but recently recognized as distinct; only known from Madagascar

\*\*\*\*Presence in the area uncertain

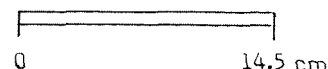
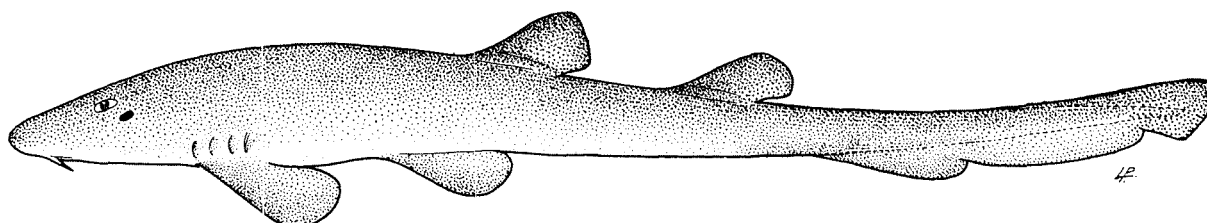
\*\*\*\*\*Occurs just outside the area, on the east coast of India

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEMISCYLLIIDAE

FISHING AREA 51  
(W. Indian Ocean)Chiloscyllium griseum Müller & Henle, 1839

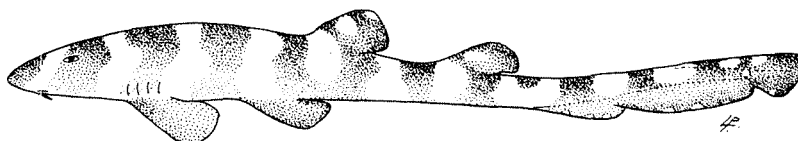
OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Grey bambooshark  
Fr - Requin-chabot gris  
Sp - Bamboa gris

NATIONAL



young

## DISTINCTIVE CHARACTERS:

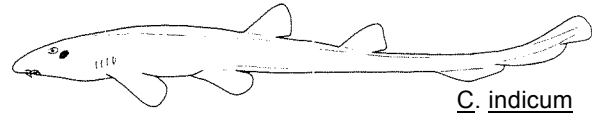
A small shark; body moderately stout, without lateral ridges; precaudal tail moderately stout, longer than trunk. Snout broadly rounded; 5 small gill slits; spiracles large and below eyes; eyes elevated, with a low supraorbital ridge above them, without nictitating eyelids; nostrils with short barbels, nasoral grooves, and circumnarial grooves; mouth small, transverse, and well in front of eyes; teeth small, similar in both jaws, with a single small cusp. Two dorsal fins, slightly smaller than pelvic fins and without attenuated, projecting free rear tips; origin of first dorsal fin varying from over last third of pelvic fin bases to over pelvic fin insertions; second dorsal fin almost as large as first; anal fin long, low and broadly rounded, with its origin behind free rear tip of second dorsal fin and with its insertion at lower caudal fin origin; caudal fin strongly asymmetrical, with a pronounced caudal subterminal notch but without a ventral lobe, its length less than 1/3 length of rest of shark. Caudal peduncle cylindrical, without keels or precaudal pits. Intestinal valve of ring type.

Colour: light brown, yellow-brown or grey-brown above, cream below, with 12 or 13 prominent saddle marks young, fading out with growth and absent in adults.

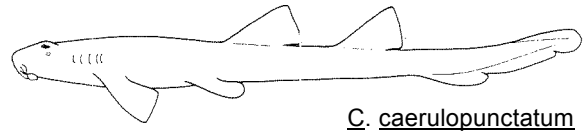


**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

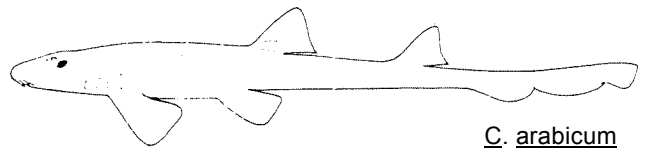
Chiloscyllium indicum: a more slender shark, with first dorsal fin origin over pelvic inner margins, anal fin origin far posterior to second dorsal rear tip; ridges present on sides; snout narrower, numerous dark spots on body.



Chiloscyllium caerulopunctatum: a rare species known from off Madagascar; dorsal fins larger; snout truncated; ridges present on sides; numerous small light blue spots on dorsal surface, dorsal pectoral and pelvic fins.



Chiloscyllium arabicum: recently described from the "Gulf"; a ridge on each side of body; free rear tips of dorsal fins attenuated; pelvic fins smaller than dorsal fins.



**SIZE:**

Maximum: at least 74 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Restricted to the northeastern part of the area, from the "Gulf" eastward to Pakistan, India, and probably Sri Lanka. Elsewhere in the Eastern Indian Ocean/Western Central Pacific, extending eastward to Malaya, Thailand, Indonesia, South China, Japan, Philippine Islands, and New Guinea, but many records need confirmation.

A common, sluggish inshore bottom dweller. Oviparous, deposits eggs in small, oval egg cases on the bottom.

Feeds probably mainly on invertebrates.

**PRESENT FISHING GROUNDS:**

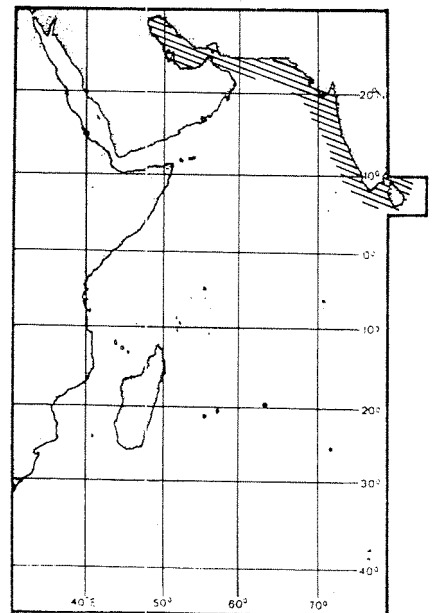
India and Pakistan.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

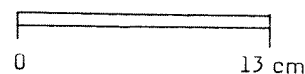
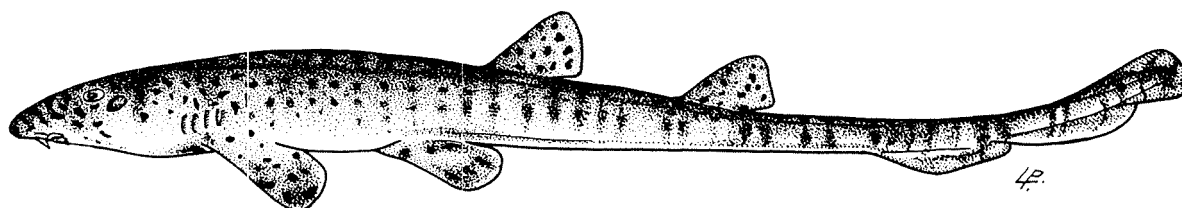
Caught in bottom trawls and in fixed bottom gillnets, drifting bottom gillnets, and occasionally pelagic gillnets.

Utilized fresh for human consumption.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEMISCYLLIIDAE

FISHING AREA 51  
(W. Indian Ocean)Chiloscyllium indicum (Gmelin, 1789)OTHER SCIENTIFIC NAMES STILL IN USE: Chiloscyllium colax (Meuschen, 1781)

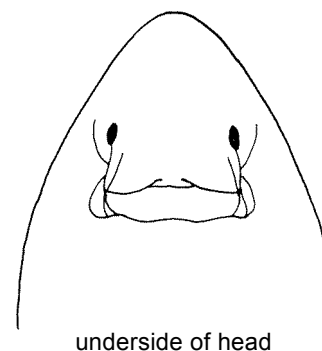
## VERNACULAR NAMES:

FAO :           En - Slender bambooshark  
                   Fr - Requin-chabot élégant  
                   Sp - Bamboa elegante

NATIONAL

## DISTINCTIVE CHARACTERS:

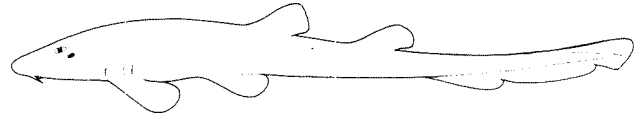
A small shark; body slender, with low lateral ridges; precaudal tail slender, longer than trunk. Snout narrowly rounded or almost pointed; 5 small gill slits; spiracles large and below eyes; eyes elevated, with a low supraorbital ridge above them, without nictitating eyelids; nostrils with short barbels, nasoral grooves and circumnarial grooves; mouth small; transverse, and well in front of eyes; teeth small, similar in both jaws, with a single small cusp. Two dorsal fins, about as large as pelvic fins and without attenuated, projecting free rear tips; first dorsal fin origin over inner margins of pelvic fins and behind pelvic insertions; second dorsal fin almost as large as first; anal fin long, low, and broadly rounded, with its origin far behind free rear tip of second dorsal fin and with its insertion at lower caudal fin origin; caudal fin strongly asymmetrical, with a pronounced subterminal notch but without a ventral lobe; caudal fin less than 1/3 the length of rest of shark. Caudal peduncle cylindrical, without keels or precaudal pits. Intestinal valve of ring type.



Colour: light brown above, cream below, with numerous dark spots on body, tail and fins, these often forming indistinct vertical bars and saddles.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other Chiloscyllium species: body and precaudal tail stouter, snout usually more broadly rounded or anteriorly truncated, first dorsal fin origin over or anterior to pelvic insertions (except in C. arabicum); dark spots few or absent.



C. griseum

## SIZE:

Maximum: about 65 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, restricted to the northeastern part, from the Arabian Sea off Pakistan to India and Sri Lanka. Elsewhere in the Eastern Indian Ocean/Western Central Pacific, extending eastward to Singapore. Thailand, Indonesia, Vietnam, Taiwan, the Philippine and Solomon Islands, and possibly Korea and Japan.

A sluggish inshore bottom dweller. Oviparous, deposits eggs in small, oval egg cases on bottom.

Feeds probably mainly on invertebrates.

## PRESENT FISHING GROUNDS:

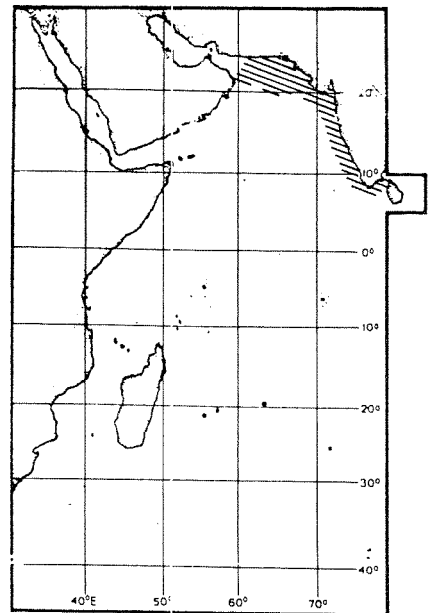
Southern India.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught in bottom trawls and in fixed bottom gillnets, drifting bottom gillnets, and occasionally pelagic gillnets.

Utilized fresh for human consumption, relatively unimportant.



HET

1983

FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

HETERODONTIDAE

Bullhead sharks

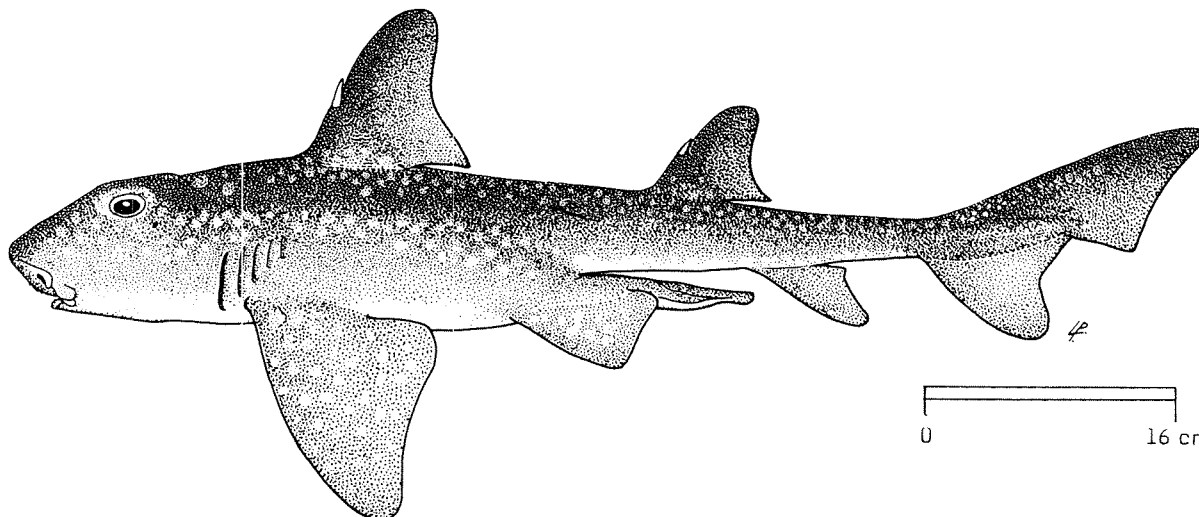
A single species in the area - see species for:  
Heterodontus ramalheira Smith, 1949

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HETERODONTIDAE

FISHING AREA 51  
(W. Indian Ocean)*Heterodontus ramalheira* (Smith, 1949)

OTHER SCIENTIFIC NAMES STILL IN USE: None



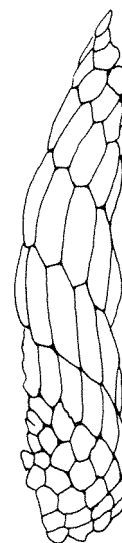
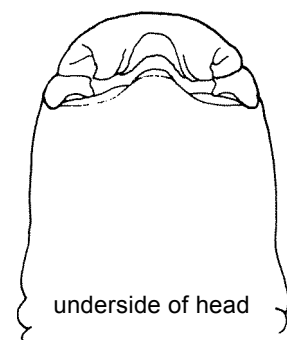
## VERNACULAR NAMES:

FAO : En - Whitespotted bullhead shark  
Fr - Requin dormeur chabot  
Sp - Dormilón boquigrande

NATIONAL:

## DISTINCTIVE CHARACTERS:

A small shark. Trunk and precaudal tail cylindrical, not depressed and without lateral ridges; precaudal tail longer than trunk. Head not expanded laterally, with prominent ridges over eyes; 5 moderate to small gill slits present, the first largest, the fifth about a third as long as the first, the last 3 over the pectoral fin bases; no gillrakers; spiracles present and very small, below level of eyes; nostrils without barbels but with strong nasoral grooves and circumnarial grooves, close in front of mouth; eyes dorsolateral on head, without nictitating eyelids; snout very short, broadly rounded, not blade-like and without lateral teeth and barbels; mouth moderately large, short, transversely arched, and well in front of eyes; labial furrows large, present on both jaws, and with uppers reaching front of mouth; teeth small and cuspidate in front of mouth but enlarged, cusplless and molariform in rear of mouth, similar in upper and lower jaws. Two dorsal fins, each with a strong spine, the first dorsal moderately large, high and apically rounded, much shorter than the caudal fin, and with its origin about over the pectoral midbases; second dorsal fin about half the size of first; anal fin smaller than second dorsal, with its origin under second dorsal inner margin, angular in shape and separated by a wide space from the lower caudal fin origin; caudal fin strongly asymmetrical, much less than half of total length, without a rippled or undulated dorsal margin but with a strong subterminal notch and a prominent lower lobe; vertebral axis of caudal fin raised above body axis. Caudal peduncle cylindrical, without precaudal pits or longitudinal keels. Intestinal valve of spiral type.

teeth from right side  
of upper jaw

Colour: dark reddish brown above, cream below, dorsal surface with scattered white spots.

### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

No other sharks in the area combine fin spines on the dorsal fins with the presence of an anal fin. The tooth morphology of this shark is unique among sharks of the area.

### **SIZE:**

Maximum: about 83 cm.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Confined to the area, from southern Mozambique, Sofala Bank, Mozambique and the eastern Arabian Peninsula.

A bottom-dwelling shark occurring in deepish water along the Western Indian Ocean, at 108 to 275 m. Probably oviparous, although egg cases have not been found.

Feeds on crabs.

### **PRESENT FISHING GROUNDS:**

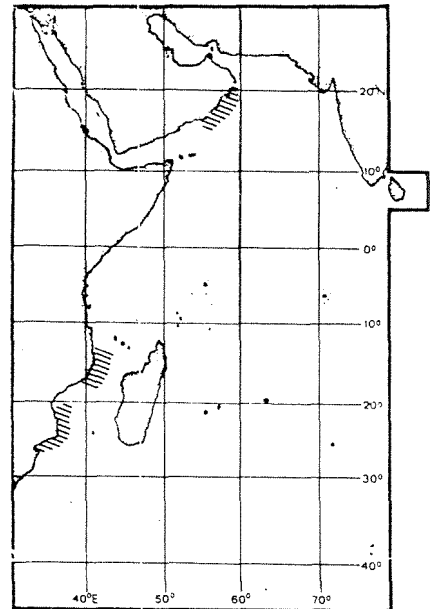
Uncertain.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls.

Utilization uncertain.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

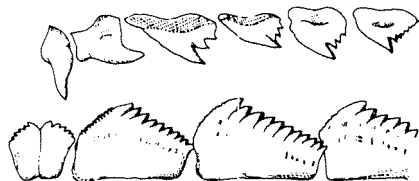
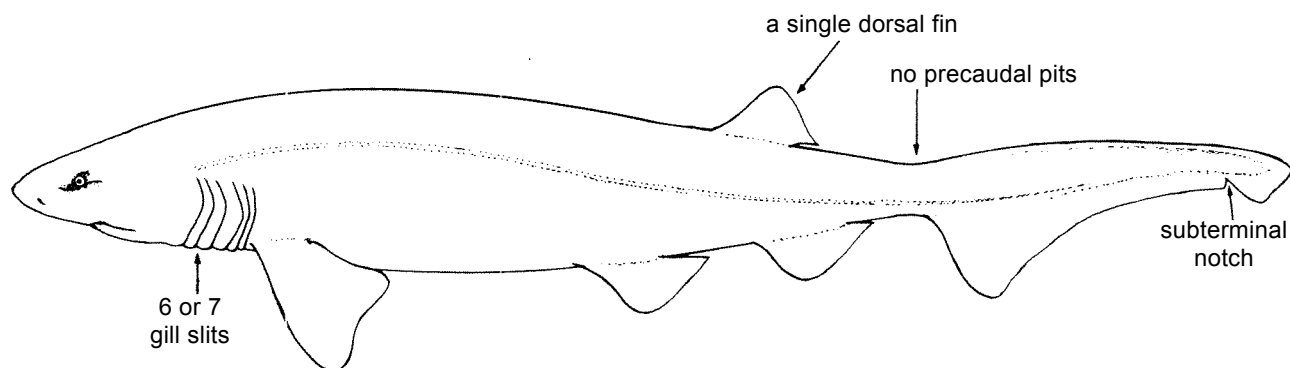
## HEXANCHIDAE

Sixgill and sevendill sharks (also, cow sharks)

Small to large sharks with slender to stout bodies, not eel-shaped. Head with 6 or 7 pairs of long gill slits, the last in front of pectoral fin origins, the first pair not connected across throat; short dermal gillrakers present on inner gill slits; spiracles present, small; nostrils without barbels or nasoral grooves; no nictitating lower eyelids; snout short, acutely to bluntly pointed; mouth very long and extending far behind the eyes; teeth of upper and lower jaws unlike at sides of mouth, uppers small, narrow, with a main cusp and often smaller cusplets, lowers very large, broad, compressed and sawlike, with a series of cusps or large cusplets. A single dorsal fin, posterior to pelvic fins; anal fin present; caudal fin much less than half the total length, strongly asymmetrical, with a pronounced subterminal notch but the lower lobe very short. Caudal peduncle not depressed, without keels; no precaudal pits. Intestinal valve of spiral type.

Colour: grey, blackish or brown above, lighter below, one species with dark and sometimes light small spots.

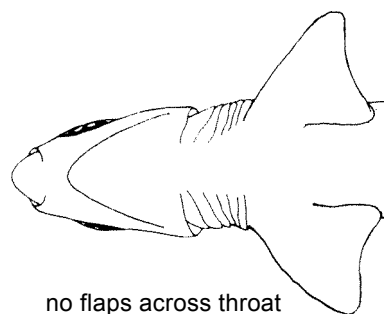
These are moderately abundant, inshore to deepwater sharks, found in shallow bays down to the continental slopes and submarine canyons. They eat a wide variety of bony fishes, other sharks, batoid fishes, cephalopods, and crustaceans. They are taken in deepwater line fisheries for sharks in the area and elsewhere, and are incidentally caught in trawls. Harmless unless provoked.



example of upper  
and lower teeth  
(*H. vitulus*)



intestinal valve  
of spiral type

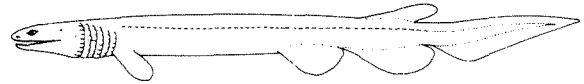


no flaps across throat

**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Chlamydoselachidae: also with a single dorsal fin and 6 gill slits, but distinguished by having a nearly terminal mouth, the first pair of gill slits connected across throat by a flap of skin, three-cusped teeth in both jaws, no subterminal notch on caudal fin, and a long, almost eel-like body.

No other sharks in the area have a single dorsal fin and 6 or 7 gill slits.

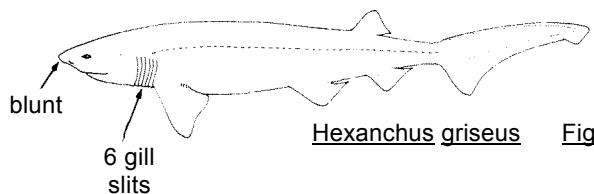


Chlamydoselachus anguineus

**KEY TO SPECIES OCCURRING IN THE AREA:**

1a. Six gill slits (Fig.1,2)

2a. Snout very short and blunt; lower jaw with 6 rows of large comblike teeth on each side; dorsal fin base separated from upper caudal fin origin by a distance about equal to, or slightly greater than its length (Fig. 1); size very large, up to 4.7 m ..... Hexanchus griseus



Hexanchus griseus Fig.1

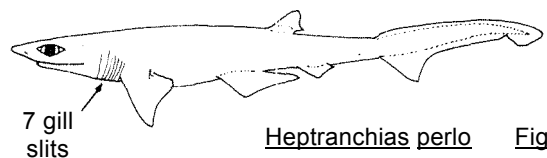
2b. Snout longer and more pointed; lower jaw with 5 rows of large comblike teeth on each side; dorsal fin base separated from upper caudal fin origin by a distance much greater than its length (Fig.2); size smaller, up to 1.8 m ..... Hexanchus vitulus



Hexanchus vitulus Fig.2

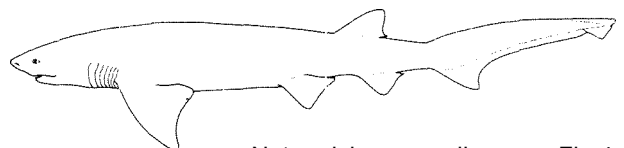
1b. Seven gill slits (Figs 3,4)

3a. Eyes very large, head extremely narrow and pointed; comblike lower teeth low and long, with primary cusp much larger than cusplets; body plain, without spots (Fig.3); size larger, up to about 1.4 m long ..... Heptranchias perlo



Heptranchias perlo Fig.3

3b. Eyes small, head broad and rounded; comblike lower teeth high and short, with primary cusp slightly larger than cusplets; body usually with scattered black spots and sometimes white spots (Fig.4); size smaller, up to about 2.9 m long ..... Notorynchus cepedianus



Notorynchus cepedianus Fig.4



**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

<u>Heptanchias perlo</u> (Bonnaterre, 1788)	HEX Hept 1
<u>Hexanchus griseus</u> (Bonnaterre, 1788)	HEX Hex 1
* <u>Hexanchus vitulus</u> Springer & Waller, 1969	HEX Hex 2
** <u>Notorynchus cepedianus</u> (Peron, 1807)?	HEX Noto 1

Prepared by L.J.V. Compagno; Tiburon Center of Environmental Studies, San Francisco State University, Tiburon, California, U.S.A.

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\*Including Hexanchus vitulus Springer & Waller, 1969

\*\*Occurrence uncertain in the area

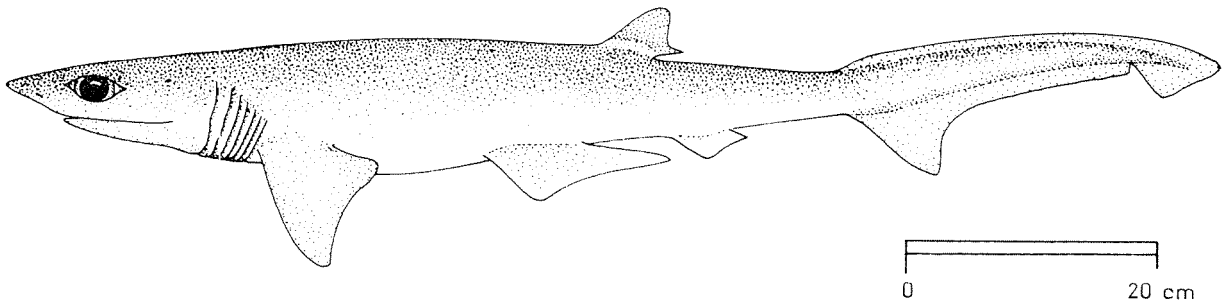
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEXANCHIDAE

FISHING AREA 51  
(W. Indian Ocean)

Hepranchias perlo (Bonnaterre, 1788)

OTHER SCIENTIFIC NAMES STILL IN USE : None



VERNACULAR NAMES:

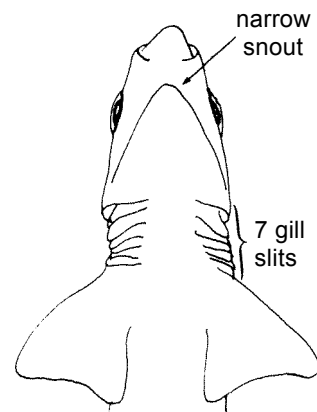
FAO: En - Sharpnose sevengill shark  
Fr - Requin perlon  
Sp - Cañabota bocadulce

NATIONAL:

DISTINCTIVE CHARACTERS:

A small, slender shark. Head with 7 gill slits; head and snout very narrow; eyes very large; teeth of upper and lower jaws unlike at sides of mouth, uppers smaller, narrower, with a main cusp and a few small cusplets, lowers larger, compressed and comblike, with a long main cusp and several cusplets, their inner edges with a few short cusplets but no serrations. A single dorsal fin, separated from origin of caudal fin by over twice its base length; a short lower caudal fin lobe in adults.

Colour: grey-brown above, pale below, the young with dark tips on dorsal fin and terminal lobe of caudal fin, lost in adults.



underside of head



teeth of left side

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Hexanchus species: 6 gill slits; inner edges of comblike lower lateral teeth with serrations.

Notorynchus cepedianus: the only other shark with 7 pairs of gill slits. but differing from this species in its much heavier body, larger size (to about 2.9 m), broader and more rounded head and snout. very small eyes, dorsal fin separated from upper caudal origin by a distance about equal to its base length, and usually numerous small black spots on body. Occurrence in the area uncertain.

**SIZE:**

Maximum: probably to 137 cm, most adults below 110 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, scattered records from off South Africa and southern Mozambique, Aldabra Island, and southwestern India, but probably more wide-ranging. Elsewhere, almost circumglobal in tropical and temperate seas, except for the Eastern North Pacific, with a primarily continental distribution.

A primarily deepwater species, found on the outer continental shelves and upper slopes down to 1 000 m, but also sometimes occurring in shallow water. Apparently an active swimmer near the bottom. Ovoviviparous, number of young from 9 to 20; size at birth near 27 cm.

Feeds on bony fishes, including hake and squid. Aggressive and quick to bite when captured, but too small to be very dangerous.

**PRESENT FISHING GROUNDS:**

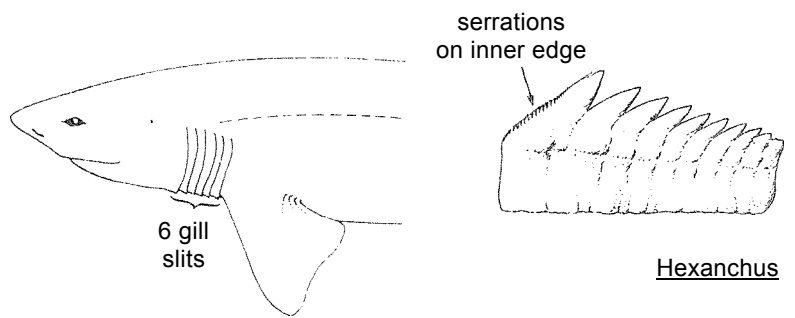
Offshore waters in the area. Apparently common in some places, including southwestern India.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

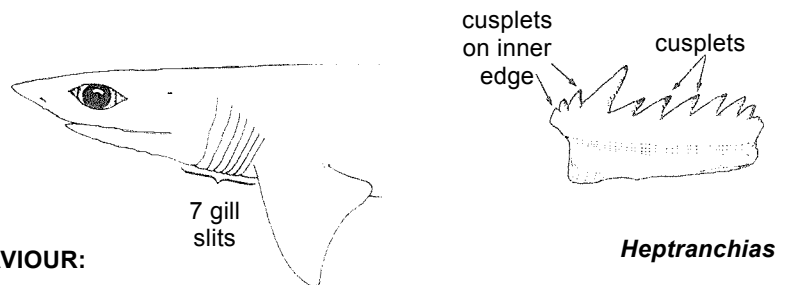
Separate statistics are not reported for this species.

Caught in bottom trawls.

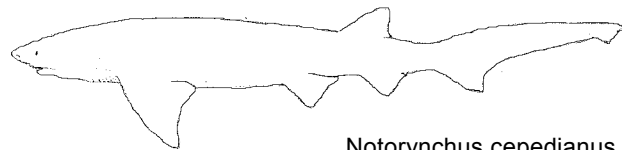
Utilization not recorded.



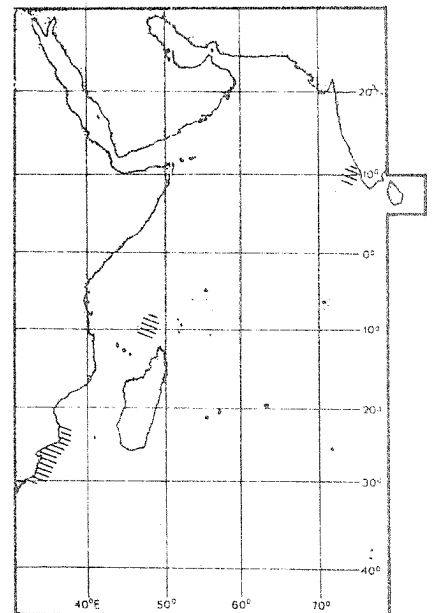
Hexanchus



Heptanchias



Notorynchus cepedianus



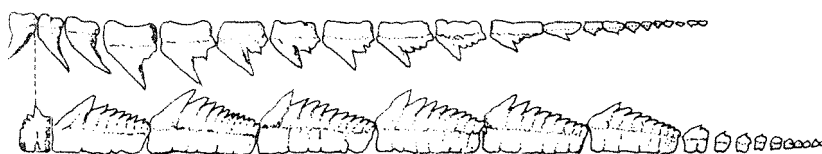
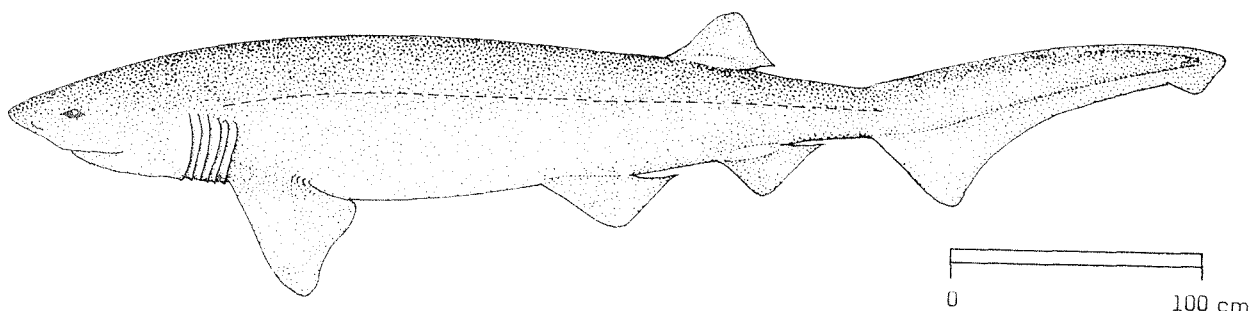
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEXANCHIDAE

FISHING AREA 51  
(W. Indian Ocean)

Hexanchus griseus (Bonnaterre, 1788)

OTHER SCIENTIFIC NAMES STILL IN USE : None



teeth of left side

VERNACULAR NAMES:

- FAO: En - Bluntnose sixgill shark  
Fr - Requin grisé  
Sp - Cañabota gris (Cañabota)

NATIONAL:

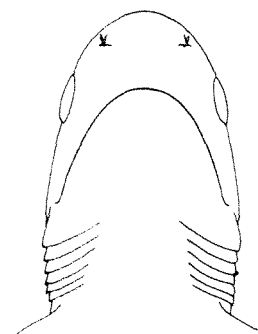
DISTINCTIVE CHARACTERS:

A very large, heavy-bodied shark with 6 gill slits. Head and snout broad, eyes relatively small; teeth of upper and lower jaws unlike at sides of mouth, uppers smaller, narrower, with a long main cusp and a few cusplets, lowers large, compressed and comblike, with a short main cusp and short cusplets, their inner edges serrated. A single dorsal fin separated from origin of caudal fin by about its base length; lower caudal lobe weak in adults, hardly indicated in immature individuals.

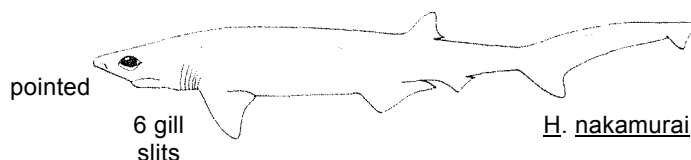
Colour: pale grey, dark grey, dark brown, or blackish above, often lighter below or even whitish.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

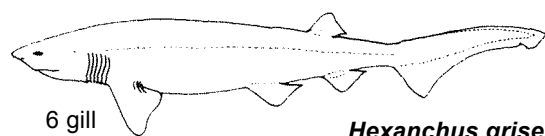
Hexanchus nakamurai: similar to H. griseus in having 6 gill slits and serrations on the mesial edges of its comblike lower teeth, but differs in being smaller and slimmer (170 cm maximum size), with a narrower head and snout, larger eyes, only 5 large comblike lower teeth on either side of symphysis (6 in H. griseus) and the dorsal fin base separated from caudal fin origin by a distance much greater than its base length.



underside of head



H. nakamurai



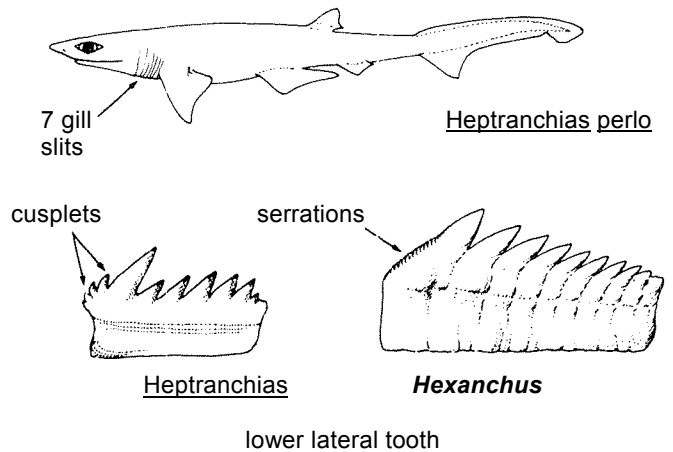
**Hexanchus griseus**

Heptranchias perlo: 7 gill slits, lower comb-like teeth with longer cusps and cusplets but without inner serrations; head and snout narrower, eyes larger; dorsal fin separated from caudal fin by a distance much greater than its base length; size much smaller (less than 1.4 m maximum), and body much slimmer.

Notorynchus cepedianus: poorly known in the area, in the extreme south marginal off the South African coast; also reported from India as Notidanus indicus, which may or may not be the same as this species; 7 gill slits, body often spotted with small black (and sometimes white) spots.

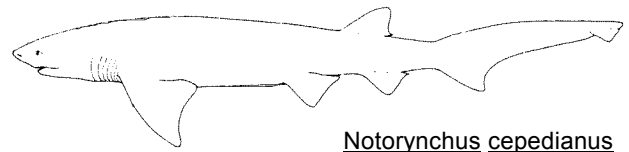
**SIZE:**

Adults to at least 482 cm, maturing at about 450 cm.



**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, known to occur off South Africa, southern Mozambique, Madagascar, the Aldabra Island group, and the Comores Islands. Elsewhere wide-ranging in the Eastern Atlantic, Mediterranean, Western Atlantic, and Western, Central and Eastern Pacific.



A large, temperate to tropical, mostly deepwater shark, perhaps occurring at greater depths closer to the equator, but recorded from the surface down to 1 875 m depth. In temperate waters the young occur in bays and at the heads of submarine canyons. Sluggish, bottom-dwelling, but strong-swimming. Ovoviviparous, with litters of 22 to 108 fetuses.

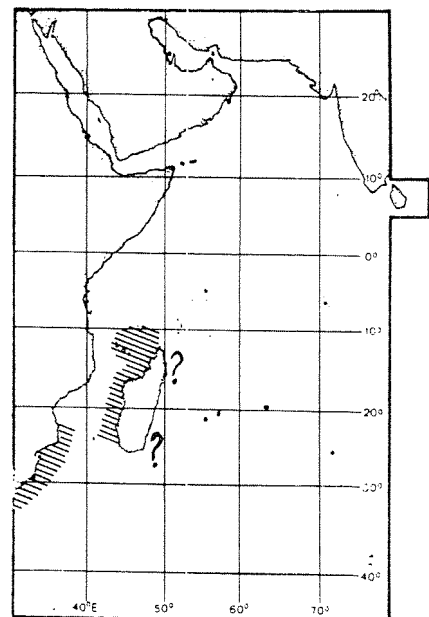
Feeds on other sharks and small to moderately large bony fishes, including dolphinfishes, small marlins and swordfishes, gurnards, hakes, lings and grenadiers, as well as crabs and shrimps. Not known to be dangerous to people, although the young will snap when captured.

**PRESENT FISHING GROUNDS:**

Offshore and probably inshore. Known to be fished off Madagascar and the Comores Islands, but possibly taken elsewhere in the region.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

- Separate statistics are not reported for this species.
- Caught in bottom trawls and with hook and line.
- Utilized for human consumption (?).



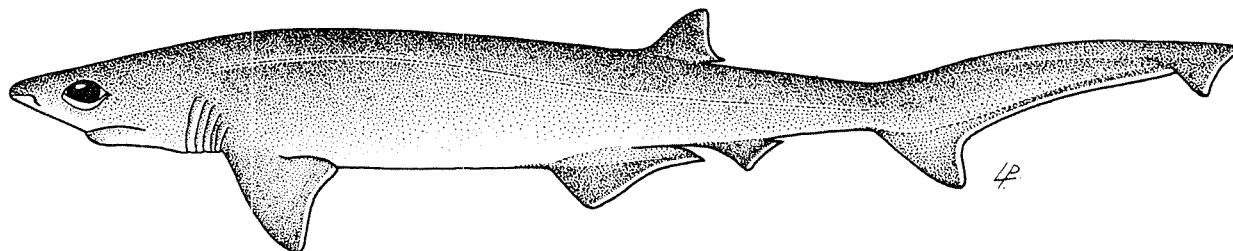
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HEXANCHIDAE

FISHING AREA 51  
(W. Indian Ocean)

Hexanchus vitulus Springer & Waller, 1969

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

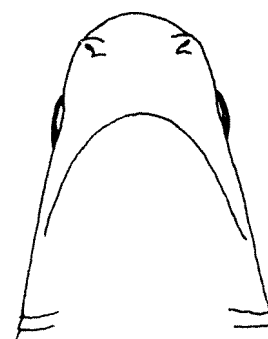
- FAO :           En - Bigeye sixgill shark  
                  Fr - Requin vache  
                  Sp - Canabota ojigrande

NATIONAL:

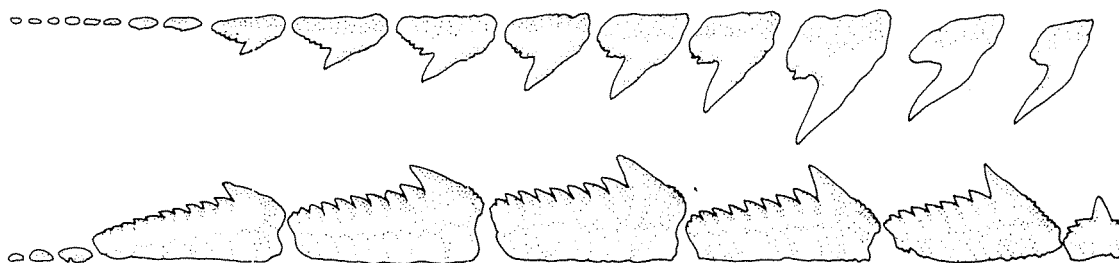
DISTINCTIVE CHARACTERS:

A moderate-sized, slender shark with 6 pairs of gill slits. Head and mouth relatively narrow, eyes large; teeth of upper and lower jaws unlike at sides of mouth; uppers smaller, narrower, with a long main cusp and a few cusplets, lowers larger, compressed and comblike, with a moderately long main cusp and short cusplets, their mesial edges serrated. A single dorsal fin separated from origin of caudal fin by a distance much greater than its base length; lower caudal lobe short but prominent in adults, weak in young.

Colour: grey-brown above, lighter below, fins with light posterior margins.



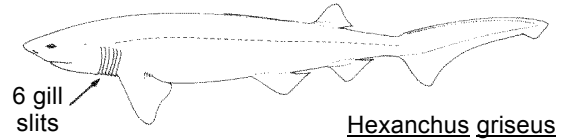
underside of head



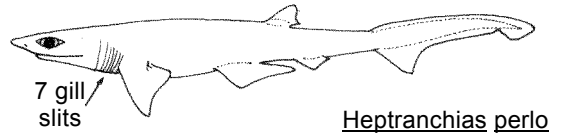
teeth of right side

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

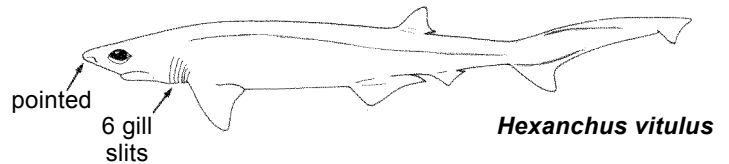
Hexanchus griseus: similar to H. nakamurai in having 6 pairs of gill slits and serrations on the mesial edges of its comblike lower teeth, but differs in being heavier-bodied (especially when adult), reaching a much greater size, and having a broader head and snout, smaller eyes, 6 large comblike lower teeth on either side of symphysis (5 in H. nakamurai) and the dorsal fin base separated from the upper caudal origin by a distance about equal to the base length.



Heptranchias perlo: 7 pairs of gill slits, lower comblike teeth with longer cusps and cusplets but without mesial serrations; head and snout narrower.

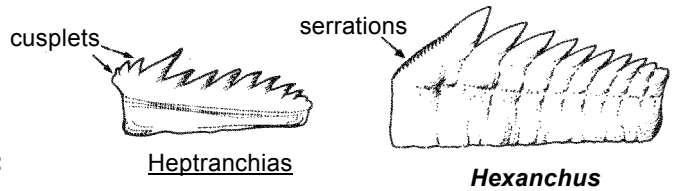


Notorynchus cepedianus: 7 pairs of gill slits, heavier-bodied and larger; to about 2.9 m; snout broader and head more rounded; eyes smaller; dorsal fin base separated from upper caudal fin origin by distance about equal to its base length; usually numerous small black spots on body.



**SIZE :**

Maximum: about 1.8 m.



**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, known from off South Africa, Madagascar, Kenya and Aldabra Islands, but probably more wide-ranging there. Elsewhere, a scattered series of records from the Western Atlantic off Bahamas, Cuba, Nicaragua and Costa Rica, the Eastern Atlantic off Gibraltar, possibly the Mediterranean, and perhaps Ivory Coast and Nigeria, and the Western Pacific off Taiwan and the Philippine Islands.

A tropical deepwater shark, little-known and probably previously confused with H. griseus in some localities. Reported at depths from 90 to 600 m, usually near the bottom, but sometimes at the surface. Oviparous, a litter of 13 young reported; size at birth about 43 cm.

Feeds on small to medium-sized fish, and probably bottom invertebrates. Not dangerous, as far as known.

**PRESENT FISHING GROUNDS:**

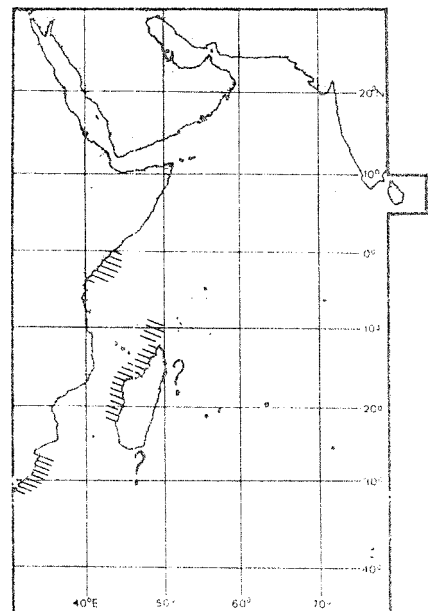
Off Madagascar, possibly Aldabra and elsewhere in the area.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls and with hook and line.

Probably utilized for human consumption.



FAO SPECIES IDENTIFICATION SHEETS

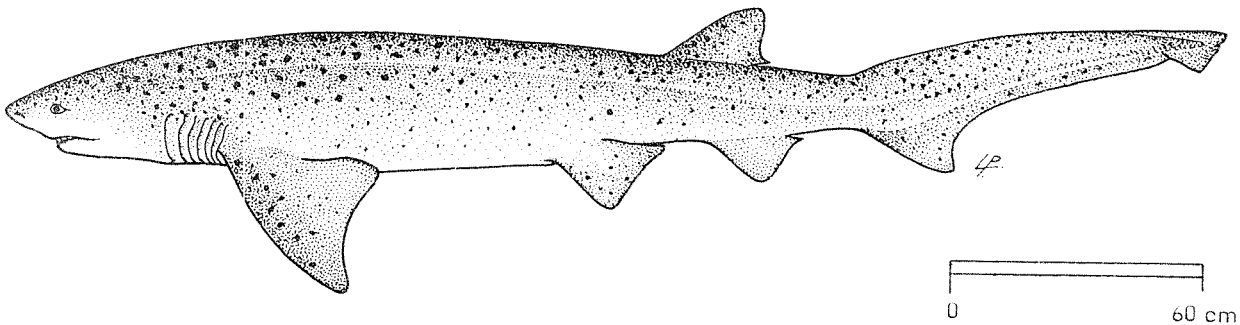
FAMILY: HEXANCHIDAE

FISHING AREA 51  
(W. Indian Ocean)

Notorynchus cepedianus (Peron, 1807)

OTHER SCIENTIFIC NAMES STILL IN USE:

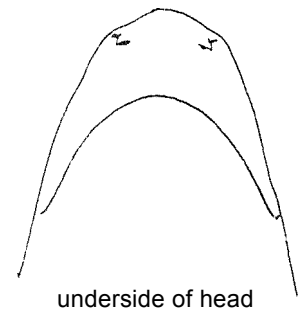
Notorynchus or Heptanchus indicus (Agassiz, 1835)  
Notorynchus or Heptanchus pectorosus (Garman, 1884)



VERNACULAR NAMES:

FAO : En - Broadnose sevengill shark  
Fr - Platznez  
Sp - Cafiabota gata

NATIONAL:



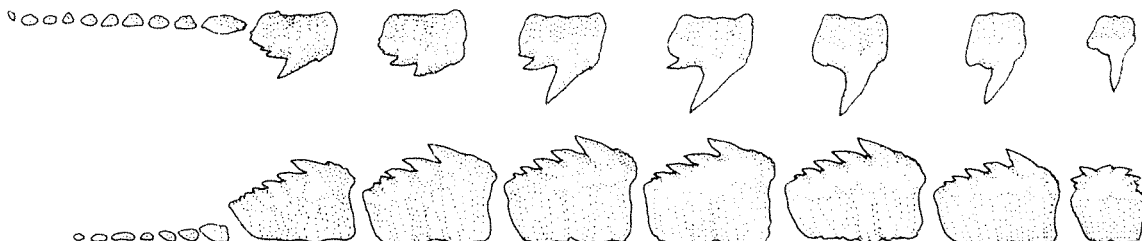
underside of head

DISTINCTIVE CHARACTERS:

A large, heavy-bodied shark. Head with 7 pairs of gill slits; head and snout very broad and rounded; eyes small; teeth of upper and lower jaws unlike at sides of mouth, uppers smaller, narrower, with a main cusp and some small cusplets, lowers larger, compressed and comblike, higher and short, with a short main cusp and several cusplets, their mesial edges with serrations. A single dorsal fin, separated from origin of caudal fin by a space about equal to its base length; lower caudal fin lobe weak in adults.

Colour: grey above, white below, usually with numerous small black spots and blotches.

teeth of the left side

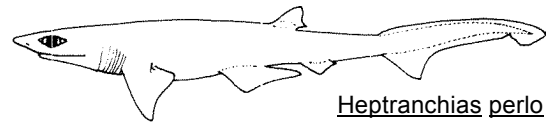




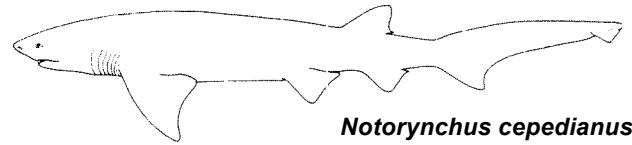
**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Heptranchias perlo: the only other shark in the area with 7 pairs of gill slits. but differing in small size, more slender body, much larger eyes; narrower, more acutely pointed head and snout; narrower mouth, lower comblike teeth with higher cusps and cusplets, longer roots and no serrations on mesial edges, dorsal fin separated from upper caudal fin origin by a space over twice its base length, and plain coloration.

Hexanchus species: 6 pairs of gill slits, plain coloration.



Heptranchias perlo



*Notorynchus cepedianus*

**SIZE:**

Maximum: to about 2.9 m, possibly 3 m.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Occurrence uncertain in the area. Off South Africa the species is apparently confined to the cool-temperate waters of the Cape region, and may or may not occur in the area. Indian records of Notorynchus species are uncertain, although the more tropical Heptranchias perlo definitely occurs there. Elsewhere, the species is wide-ranging in the Western South Atlantic, Eastern Pacific, and Western Pacific, but has an antitropical distribution in temperate waters.

A coastal shark, occurring from the intertidal and shallow bays down to at least 46 m depth, often near the bottom. Ovoviviparous, length at birth below 53 cm.

A fairly active, strong-swimming, indiscriminate predator, feeding on other sharks and rays, a variety of bony fishes, marine mammals (as carrion), and even garbage. Aggressive when provoked and potentially dangerous.

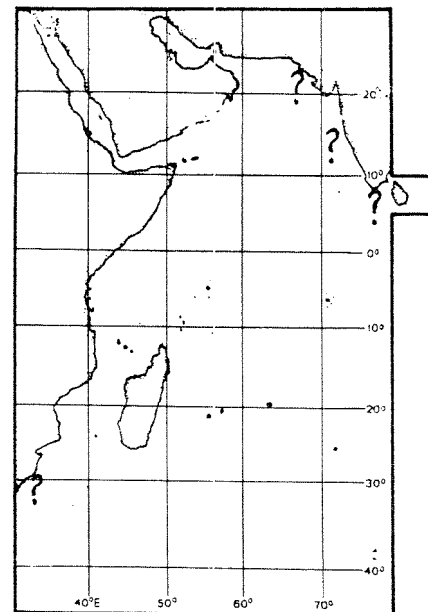
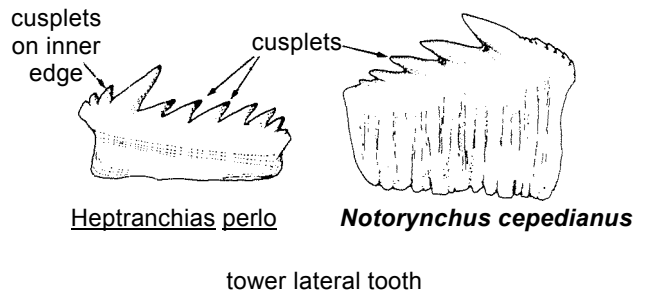
**PRESENT FISHING GROUNDS:**

Unknown.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Gear and mode of utilization unknown.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

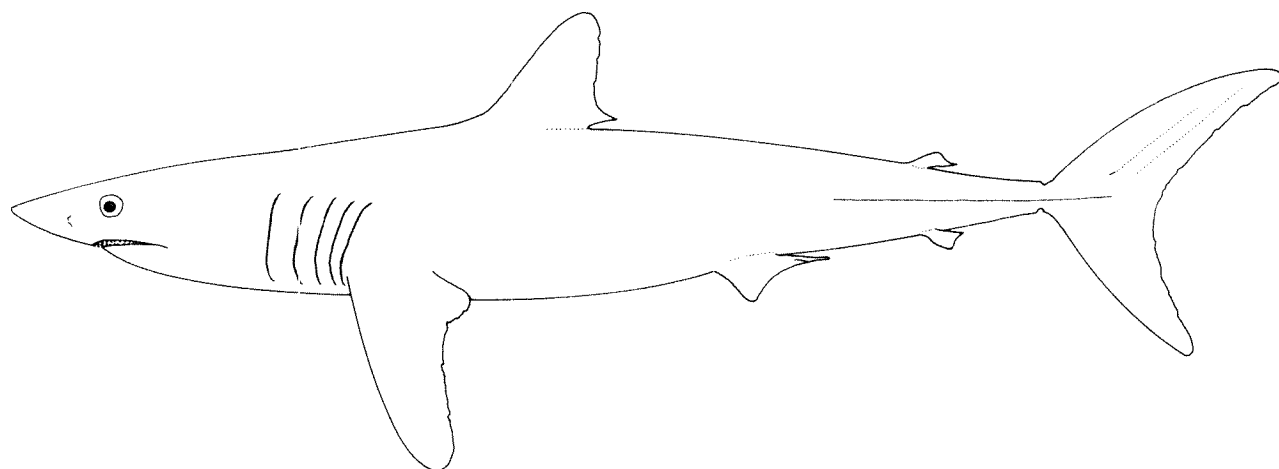
## LAMNIDAE

Mackerel sharks, makos, white sharks, porbeagles

Large-sized sharks of fusiform body. Head with 5 gill slits, all in front of pectoral fin origins; gill arches without rakers; no nictitating eyelids; teeth long and few in number, awl- or blade-like, with a single cusp. Two dorsal fins, the first much shorter at base than caudal fin and far in advance of pelvic fins; second dorsal fin and anal fin much smaller than first dorsal; caudal fin lunate, less than one third the total length. Caudal peduncle strongly depressed dorso-ventrally and expanded laterally, with a prominent keel on each side, extending well out on caudal fin. Intestinal valve of ring type.

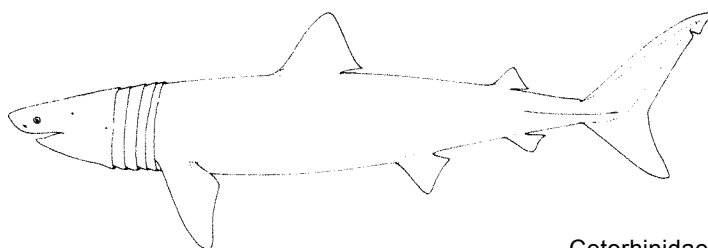
Colour: back greyish blue to black, or brownish; belly white.

Mackerel sharks inhabit temperate and tropical waters (oceanic as well as coastal) throughout the world. They are very fast swimmers and voracious predators, feeding mainly on fish and squid, but also other sharks, batoids, marine mammals, sea birds, and carrion; some species are dangerous to man. Mackerel sharks are often used for food or for production of liver oil, fishmeal and other shark products.



## SIMILAR FAMILIES OCCURRING IN THE AREA:

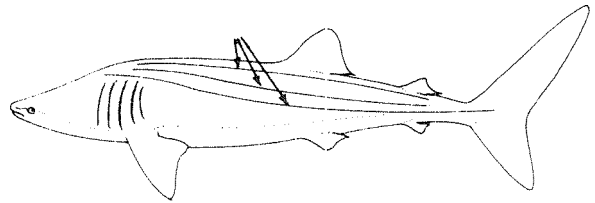
Cetorhinidae: the basking shark, Cetorhinus maximus (Gunnerus, 1765), Family Cetorhinidae, is found slightly to the southwest of the area off the Cape coast of South Africa, where it is rare, but may eventually be found in the area. It resembles members of Lamnidae in having a lunate caudal fin with strong caudal keels, but has much longer gill openings, extending from upper surface of head to throat; gillrakers well developed on internal gill openings; teeth minute and hooked, not bladelike; anal and second dorsals larger and broad-based, not pivotable (narrow based, very small, and capable of pivoting to either side in Lamnidae); and size of adults larger (9 m or more).



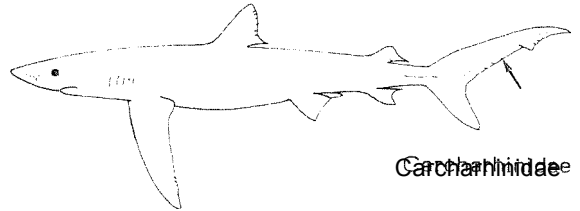
Cetorhinidae

Rhiniodontidae: caudal fin also lunate, but body with several prominent dermal ridges on either side; last gill slit well behind pectoral fin origin; snout squared off anteriorly; mouth nearly terminal; at least half of first dorsal fin base posterior to pelvic fin origins; gill arches connected by masses of spongy tissue; and a spotted and striped colour pattern.

All other shark families: caudal fin strongly asymmetrical and not lunate, the upper lobe extending far beyond lower lobe; caudal peduncle not greatly flattened dorso-ventrally.



Rhiniodontidae

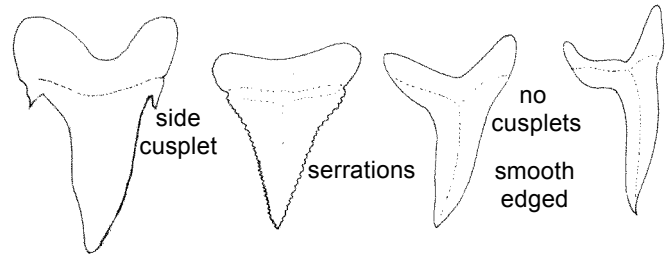


Carcharhinidae

**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

1a. Teeth with small side cusplets (Fig. 1a) (except in specimens less than 1 m long); origin of second dorsal fin above that of anal fin; caudal fin with a small, but strong, secondary keel below the rear end of primary keel (Fig. 2)..... Lamna nasus

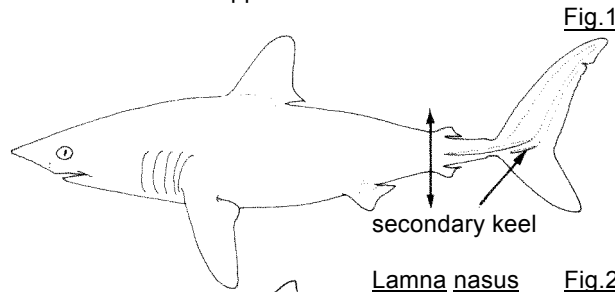
1b. Teeth without side cusplets (Fig. 1b,c,d) except in Carcharodon less than 2 m long); origin of second dorsal fin in advance of anal fin origin; caudal fin without a secondary keel



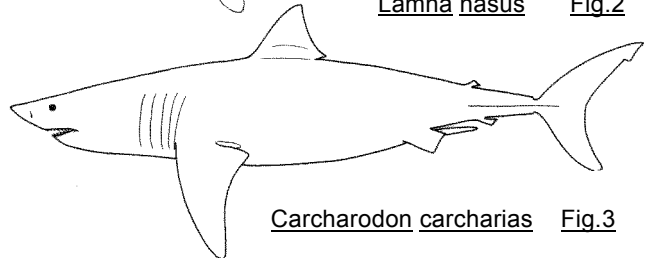
a) Lamna nasus b) Carcharodon carcharias c) Isurus paucus d) Isurus oxyrinchus  
upper tooth

2a. Upper teeth triangular with serrate edges (Fig. 1b); origin of first dorsal fin opposite or slightly anterior to inner corner of pectoral fins when latter are laid back; anal fin origin posterior to second dorsal fin base (Fig. 3) ..... Carcharodon carcharias

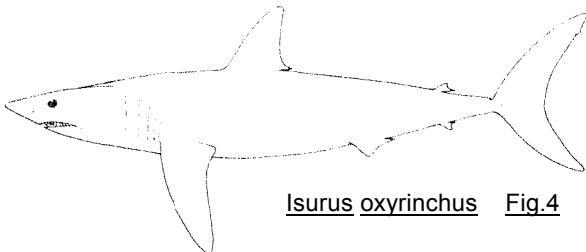
2b. Upper teeth with smooth-edged cusps (Fig. 1c,d); origin of first dorsal fin posterior to inner corner of pectoral fins when latter are laid back; anal fin origin below about middle of second dorsal fin base (Figs. 4,5)..... Isurus



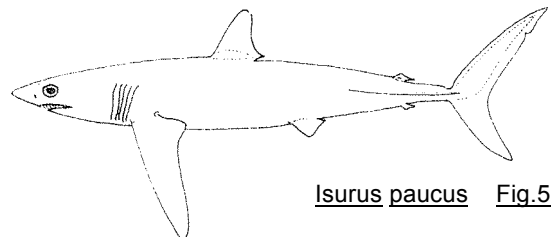
Lamna nasus Fig. 2



Carcharodon carcharias Fig. 3



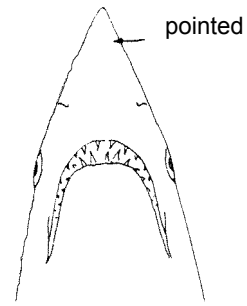
Isurus oxyrinchus Fig. 4



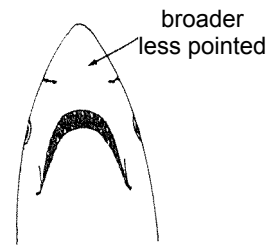
Isurus paucus Fig. 5

3a. Snout usually acutely pointed (Fig. 6a); cusps of upper and lower anterior teeth recurved at bases but with tips reversed and curving outward; pectoral fins considerably shorter than head, relatively narrow-tipped in young, acutely pointed in adults; origin of anal fin about under midbase of second dorsal fin (Fig. 4); underside of snout and mouth white ..... Isurus oxyrinchus

3b. Snout narrowly to bluntly (usually not acutely) pointed (Fig. 6b); cusps of upper and lower anterior teeth straighter, with tips not reversed; pectoral fins about as long as head, relatively broad-tipped in young and adults; origin of anal fin about under insertion of second dorsal fin (Fig. 5); underside of snout and mouth dusky ..... Isurus paucus



a) I. oxyrinchus



b) I. paucus

head viewed from below

Fig.6

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

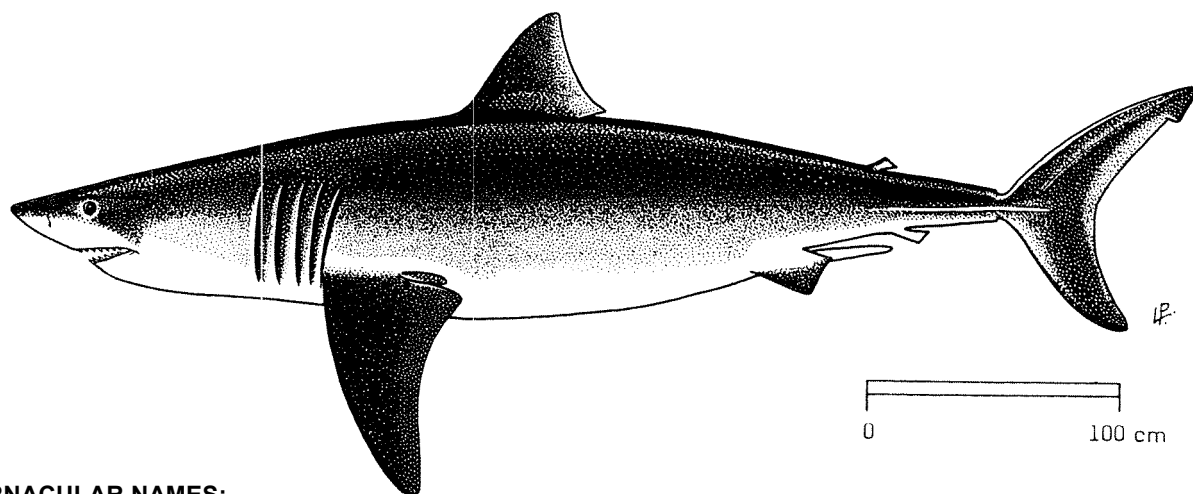
<u>Carcharodon carcharias</u> (Linnaeus, 1758)	LAMN Car 1
<u>Isurus oxyrinchus</u> Rafinesque, 1810	LAMN Isur 1
<u>Isurus paucus</u> Guitart, 1965	LAMN Isur 2
<u>Lamna nasus</u> (Bonnaterre, 1788)	LAMN Lamn 1

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: LAMNIDAE

FISHING AREA 51  
(W. Indian Ocean)Carcharodon carcharias (Linnaeus, 1758)

OTHER SCIENTIFIC NAMES STILL IN USE: None



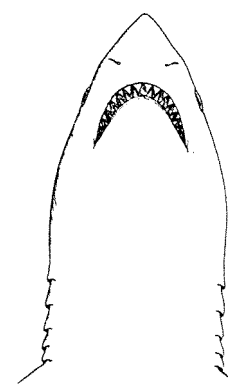
## VERNACULAR NAMES:

FAO : En - Great white shark  
Fr - Grand requin blanc  
Sp - Jaquetón blanco (= Jaquetón)

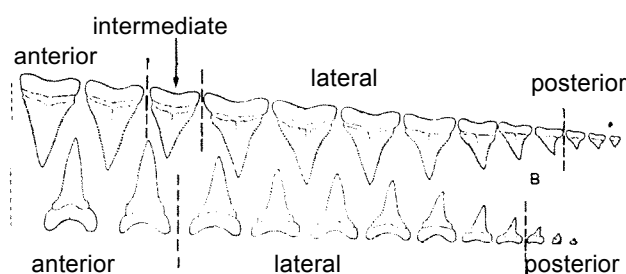
NATIONAL:

## DISTINCTIVE CHARACTERS:

A very large shark with a fusiform, usually heavy body and a moderately long, bluntly pointed snout. Head with 5 long gill slits, all in front of pectoral fin origins; gill arches without rakers; spiracles very small; mouth long and broadly rounded; teeth very large and relatively few, narrower in the lower than in the upper jaw, pointed backwards, with a single broad cusp and strong serrations at most sizes irregular in individuals below 1.5 m length, and with cusplets present at about 2 m length or less, but lost in larger individuals); anterior teeth greatly enlarged in both jaws, in two rows on either side of symphysis, broadly triangular and compressed, not recurved; intermediate and first few lateral teeth a little smaller, the intermediate ones less differentiated from the anterior and lateral teeth than in other members of the family; two dorsal fins, the first large, originating over inner margins of pectorals, the second very small; pectoral fins shorter than head and falcate; anal fin origin posterior to rear end of second dorsal fin base; caudal fin lunate, its lower lobe strongly developed. Caudal peduncle very much flattened dorso-ventrally, expanded laterally, with a prominent keel on either side extending well out on caudal fin but with no secondary keel on the fin.



underside of head



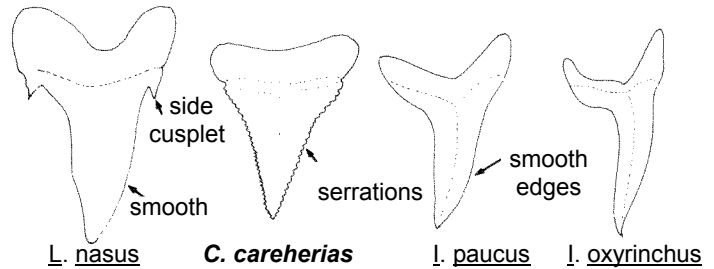
teeth from left side

Colour: grey-brown, dark grey, blue-grey, blackish, light grey or grey-white above, white below, fins with dusky margins below, black tips on underside of pectoral fins, a black spot present or lacking on pectoral fin axils.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Isurus and Lamna species: head narrower, teeth narrow-cusped, not serrated, anal fin origin under second dorsal base (Isurus) or under second dorsal origin (Lamna).

No other sharks in the area have the combination of characters underlined above.



**SIZE:**

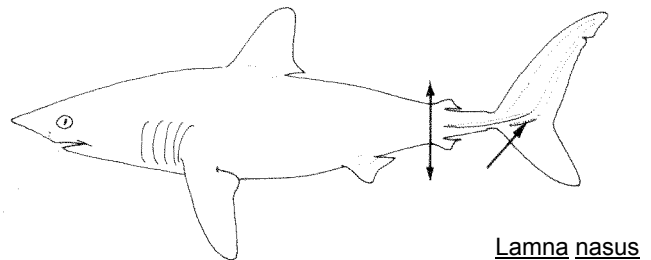
Maximum: to at least 640 cm and possibly 800 cm (a record for 1098 cm later proved incorrect); common to 400-600 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

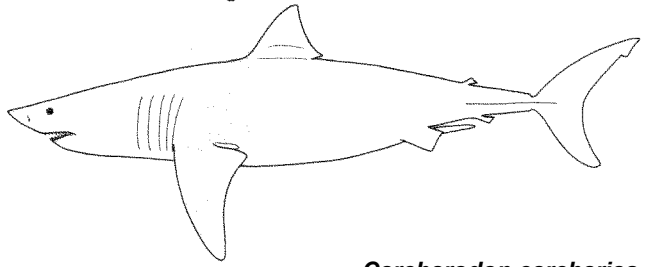
In the area only known from the coast of South Africa and the Seychelles; an old record from the Red Sea may have been based on a species of Carcharhinus. Elsewhere, circumglobal in cold-temperate to tropical seas, but primarily in cool to warm-temperate waters.

A coastal offshore and inshore species, not oceanic, often occurring close inshore and entering shallow bays. A powerful, strong swimmer, occasionally leaping out of the water like Isurus oxyrinchus. Ovoviviparous, possibly up to 9 fetuses in a litter, size at birth between 60 and 140 cm.

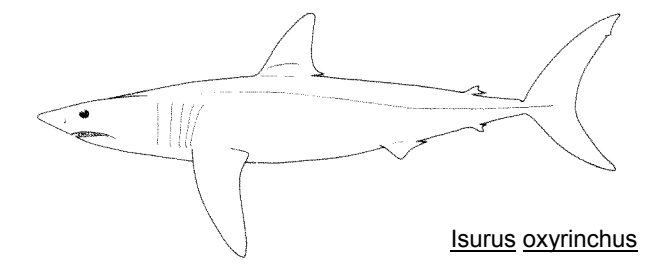
A voracious and extremely powerful predator, feeding on a wide variety of small to large marine animals. including other sharks, rays, chimaeras, bony fishes, seals and sea lions, sea birds, and squid as well as carrion. A dangerous species, responsible for a number of unprovoked attacks on swimmers, divers, surfers and boats; considered one of the most dangerous if not the most dangerous and formidable of living sharks. Unpredictable when confronting humans in the water; individuals may swim past people and boats, merely observing; may deliver tentative attacks (possibly mistaking people for more normal prey but possibly also as a sign of aggressive threat) without completing a bite and then departing without attacking further; or may bite repeatedly, apparently in feeding (fortunately this rarely happens).



Lamna nasus



**Carcharodon carcharias**



Isurus oxyrinchus

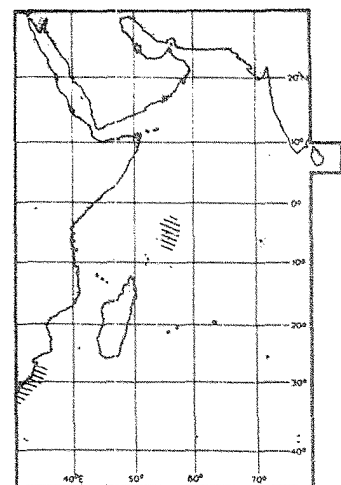
**PRESENT FISHING GROUNDS:**

Unknown.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

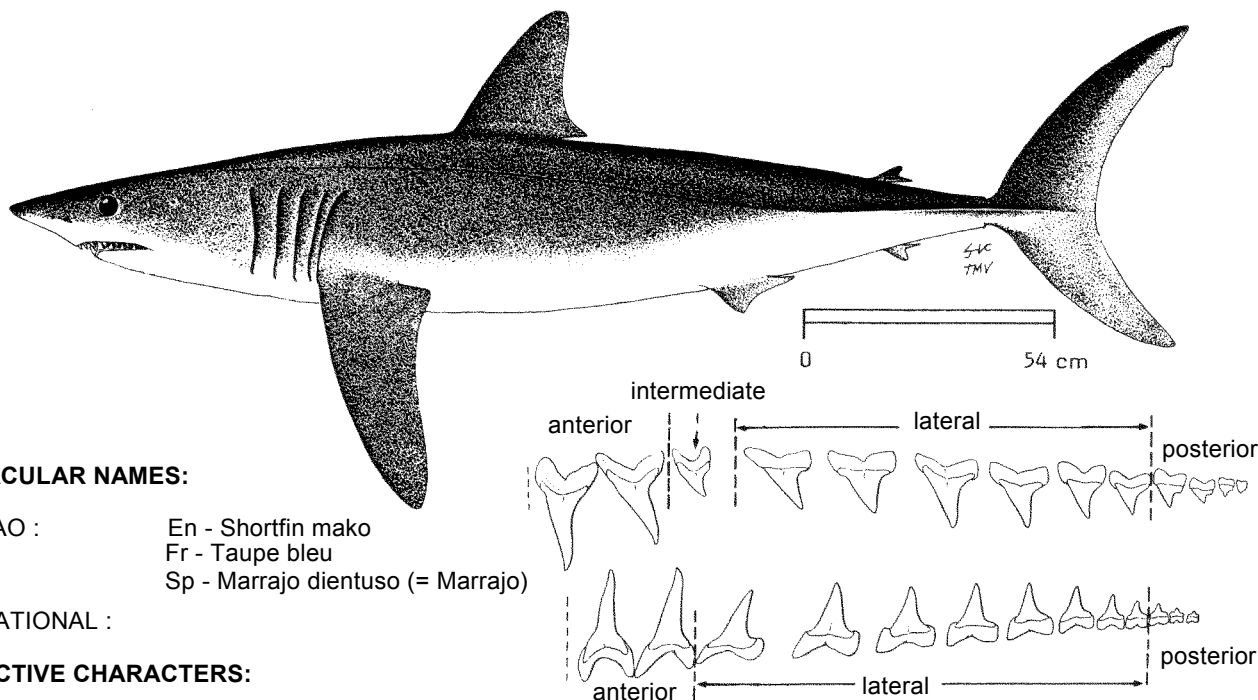
Separate statistics are not reported for this species.

Commercial utilization uncertain, sometimes caught by sports anglers.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: LAMNIDAE

FISHING AREA 51  
(W. Indian Ocean)Isurus oxyrinchus Rafinesque, 1810OTHER SCIENTIFIC NAMES STILL IN USE : Isurus glaucus (Müller & Henle, 1839)

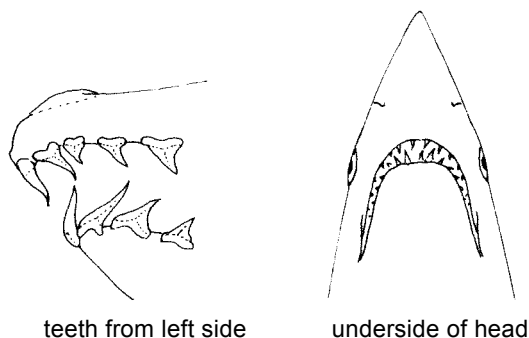
## VERNACULAR NAMES:

FAO : En - Shortfin mako  
Fr - Taupe bleu  
Sp - Marrajo dientuso (= Marrajo)

NATIONAL :

## DISTINCTIVE CHARACTERS:

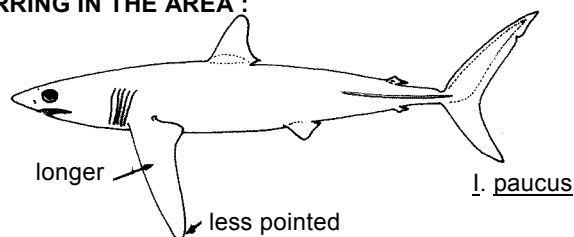
A large shark of fusiform and rather slender body and a long and acutely pointed snout. Head with 5 long gill slits, all in front of pectoral fin origins; gill arches without rakers; spiracles very small; mouth broadly rounded and notably long. Teeth strong and relatively few, alike in both jaws, backward-pointing, somewhat flexuous in outline, smooth-edged, with a single cusp; the first 2 in each jaw much the largest, recurved at base but curve reversed at tips. Two very unequal dorsal fins, the first comparatively large, its origin posterior to inner corners of pectoral fins when latter are laid back, its apex bluntly rounded (young) to acutely pointed (adults); pectoral fins moderately long (shorter than head) and falcate; anal fin origin below about middle of second dorsal fin base; caudal fin lunate, its lower lobe strongly developed. Caudal peduncle very much flattened dorso-ventrally, but expanded laterally, with a prominent keel on each side extending well out on caudal fin.



Colour; back grey-blue, occasionally deep blue; belly white.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA :

Isurus paucus: snout blunter; cusps of teeth broader, less curved; pectoral fins about as long as head (shorter than head in I. oxyrinchus); snout and area around mouth dark.

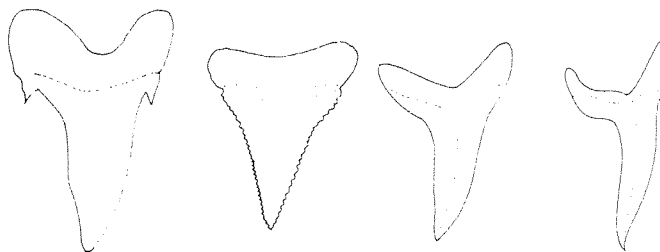


Carcharodon carcharias: snout blunter; teeth broad, with serrated edges; origin of first dorsal fin opposite or slightly anterior to inner corners of pectoral fins when latter are laid back; anal fin origin posterior to second dorsal fin base.

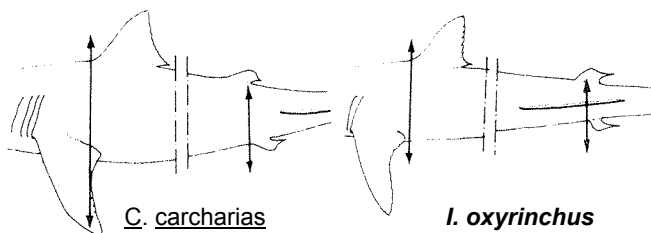
Lamna nasus: teeth smaller, with shorter, straight cusps and side cusplets; origin of first dorsal fin in front of inner corners of pectoral fins; second dorsal fin origin about over anal fin origin; caudal fin with a small secondary keel below large, primary peduncle keel.

Other large-sized sharks with a lunate caudal fin and strong caudal keels:

Rhiodon typus: 3 prominent dermal crests on each side; snout squared off anteriorly; mouth nearly terminal; last gill slit well behind pectoral fin origin; internal gill slits with filter grids; at least half of first dorsal fin base posterior to pelvic fin origins; a colour pattern of light spots and stripes.



L. nasus    C. carcharias    J. paucus    I. oxyrinchus  
upper tooth



C. carcharias                      I. oxyrinchus

**SIZE:**

Maximum: 400 cm; common to 270 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Probably widespread in the area, from South Africa, Mozambique, Madagascar, Mauritius, the Red Sea, Oman, Pakistan, India and probably Sri Lanka; elsewhere found in all warm temperate and tropical seas.

An oceanic and coastal species, usually in surface waters, approaching close inshore. Perhaps the most active and strong-swimming of sharks, renowned for leaping out of the water, especially when hooked. Ovoviviparous, number of young in a litter relatively small (1 to 6, rarely 10); size at birth between 60 and 70 cm.

Feeds heavily on schooling fishes (mackerels, jacks, herrings, etc.); also small sharks; attacks larger species such as tunas and swordfishes. An aggressive, dangerous shark, responsible for unprovoked attacks on swimmers and boats; hooked individuals fight very hard and may leap into the boats of anglers attempting to subdue them. Famed as one of the finest marine game fishes.

**PRESENT FISHING GROUNDS:**

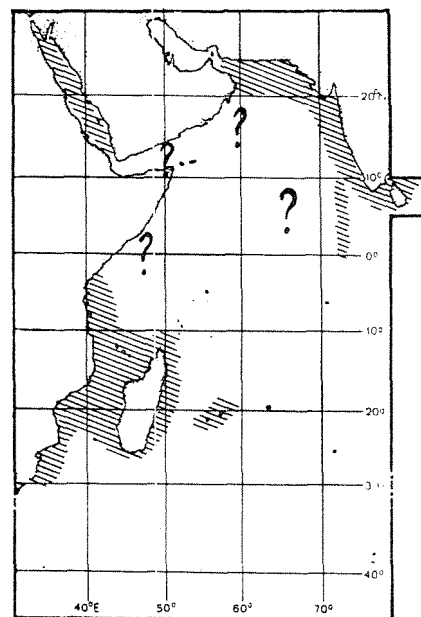
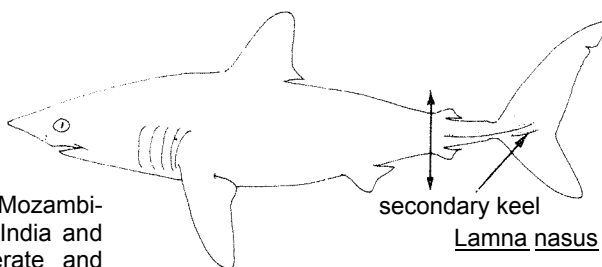
Oceanic and coastal

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught on drifting longlines; probably also with gillnets and with hook and line.

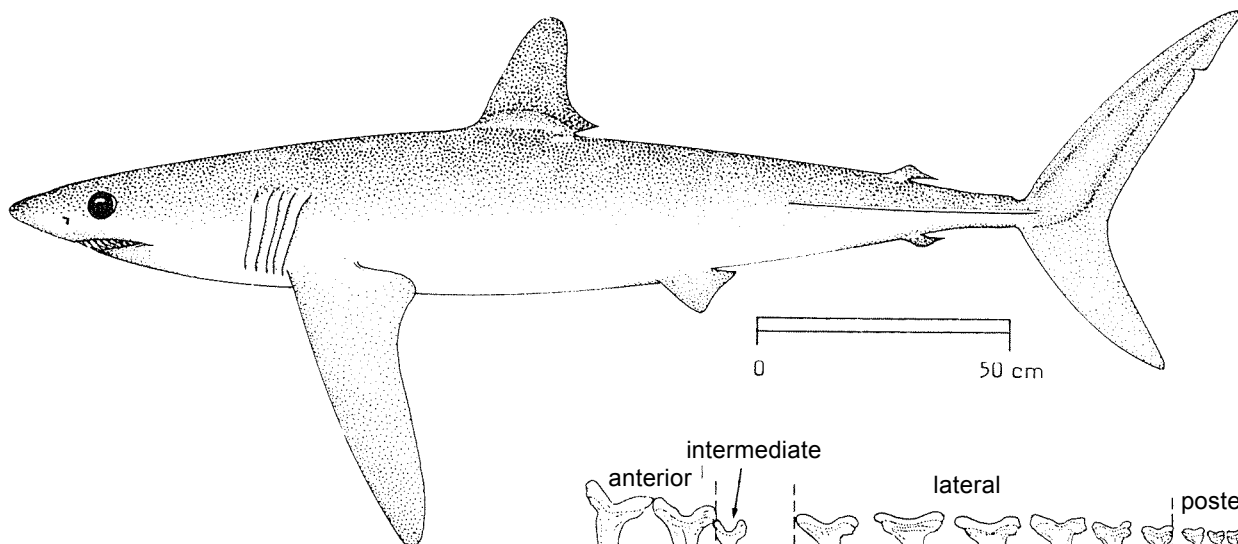
Utilized fresh for human consumption; fins may figure in the oriental sharkfin trade. One of the finest sharks for human consumption.





## FAO SPECIES IDENTIFICATION SHEETS

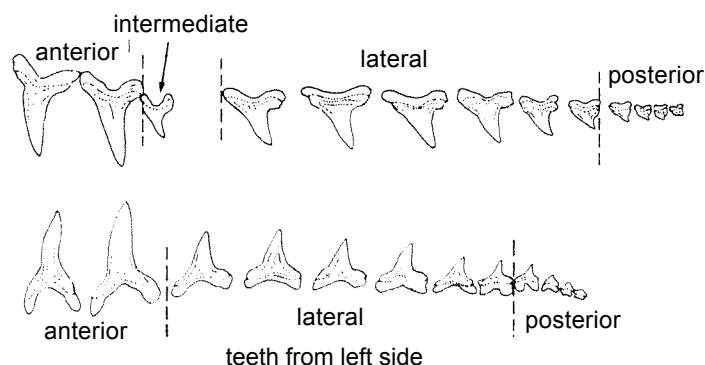
FAMILY: LAMNIDAE

FISHING AREA 51  
(W. Indian Ocean)*Isurus paucus* Guitart, 1965OTHER SCIENTIFIC NAMES STILL IN USE: *Isurus alatus* Garrick, 1966

## VERNACULAR NAMES:

FAO : En - Longfin mako  
Fr - Petit taupe  
Sp - Marrajo carite

NATIONAL :



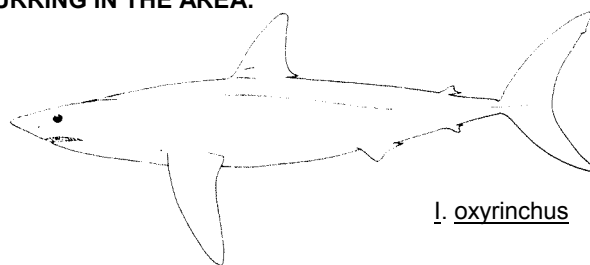
## DISTINCTIVE CHARACTERS:

A large shark with a fusiform and rather slender body and a long, pointed snout. Head with 5 long gill slits, all in front of pectoral fin origins; gill arches without rakers; spiracles very small; mouth long and broadly rounded; teeth large and relatively few, alike in both jaws, pointed backward, with a single cusp but without cusplets or serrations; anterior teeth greatly enlarged in both jaws, in 2 rows on each side, cusps recurved at bases but not reversed at tips. Two dorsal fins, the first large, originating posterior to free rear tips of pectorals, with a bluntly rounded apex, the second very small; pectoral fins about as long as head, straight to falcate, and broad-tipped; anal fin very small, originating about under rear end of second dorsal fin base; caudal fin lunate, with a very long lower lobe. Caudal peduncle strongly flattened dorso-ventrally and expanded laterally, with a prominent keel on each side extending well onto caudal fin.

Colour: back and sides intense blue in life, fading to blackish after death, abdomen white; underside of snout and mouth partly to entirely dusky; undersides of pectoral fins with dark blotches in larger individuals, pelvic fins dark with white posterior ends above, white- or dark-blotched below; anal fin with dark blotches, or white with an anterior dark blotch.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

*Isurus oxyrinchus*: snout usually more acutely pointed; anterior teeth with more flexed cusps; pectoral fins considerably shorter than head, less broad-tipped in young, acutely pointed in adults; origin of anal fin about under midbase of second dorsal fin; underside of snout and mouth not dusky.

*I. oxyrinchus*

Carcharodon carcharias: body usually much stouter; teeth broad and flattened, with serrated edges; first dorsal fin origin anterior to inner corners of pectorals; pectoral fins much shorter than head, with narrowly rounded or pointed apices; back lead-grey to blackish.

Lamna nasus: body much stouter; anterior teeth small and short-cusped, with small side cusplets; origin of first dorsal fin well anterior to inner corners of pectoral fins, its free rear tip and lobe white (dark in I. paucus); caudal fin with a secondary keel; back bluish-grey.

Prionace glauca: nictitating eyelids present; snout blunter and more flattened; gill slits smaller, the last two over pectoral fin bases; dermal gill rakers present; anterior teeth not greatly enlarged; upper teeth flattened, triangular and serrated; no upper intermediate teeth; caudal keel very weak; lower caudal lobe shorter.

Rhiniodon typus: 3 strong dermal ridges on each side; snout anteriorly truncated; mouth nearly terminal, in front of eyes; last 2 gill slits over pectoral fin bases; internal gill slits with a filter grid; pelvic fin origins under first dorsal fin base; a colour pattern of light spots and stripes; adult size much larger, up to at least 12 m.

**SIZE:**

Maximum: at least 280 to 300 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area. probably off Madagascar, but likely to be more wide-ranging. Elsewhere in the tropical Atlantic and Central Pacific

A little-known oceanic shark, possibly approaching land to give birth. Ovoviviparous, number of young 2; size at birth at least 92 cm.

Probably feeds on oceanic schooling fishes as does I. oxyrinchus, but its large broad fins and slender body suggest that it is a slower, less active shark than that 'species. Not known to have attacked people or boats, but potentially dangerous because of its size and large teeth.

**PRESENT FISHING GROUNDS:**

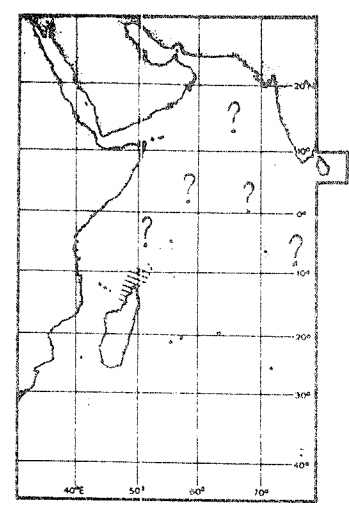
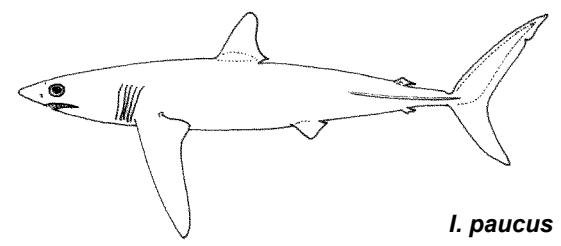
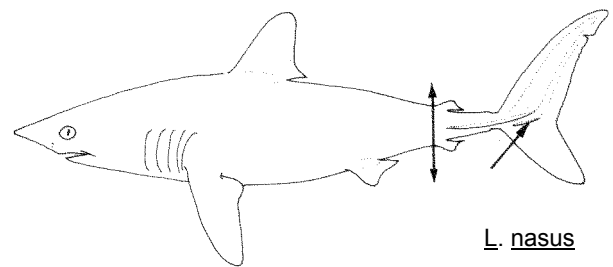
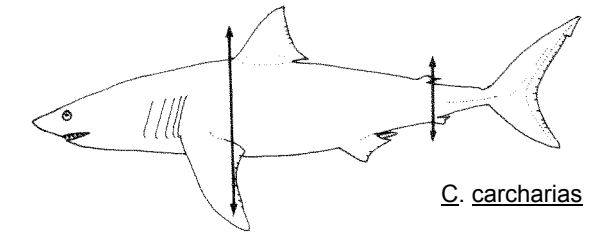
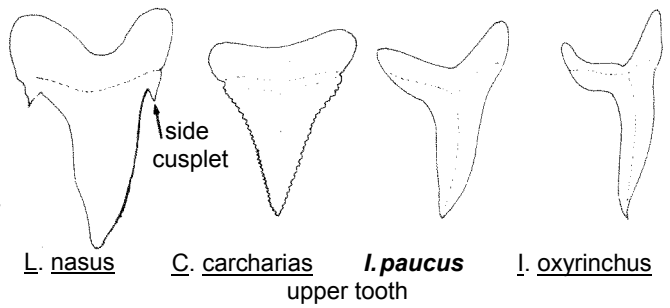
Uncertain, probably offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught on drifting longlines.

Utilization not recorded.

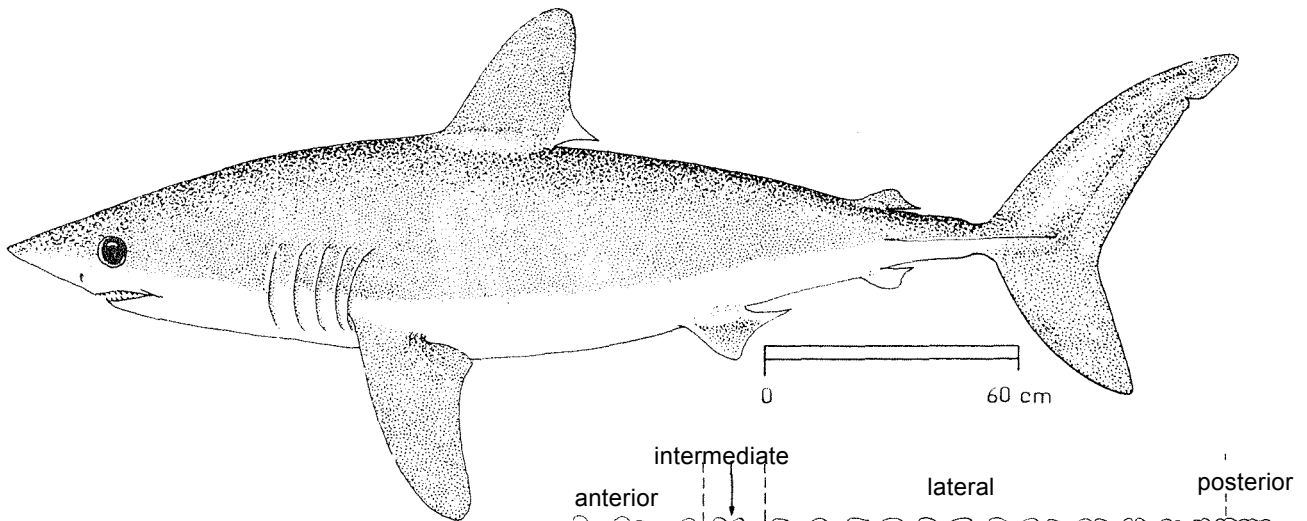


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: LAMNIDAE

FISHING AREA 51  
(W. Indian Ocean)Lamna nasus (Bonnaterre, 1788)

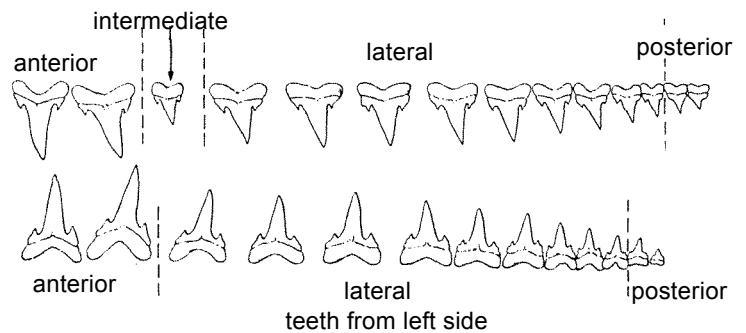
OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

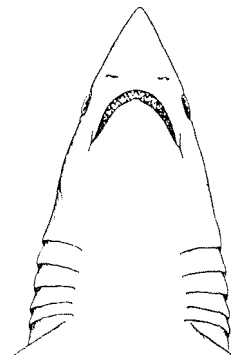
FAO: En – Porbeagle  
Fr – Taupe commun  
Sp – Marrajo sardinero

NATIONAL:



## DISTINCTIVE CHARACTERS:

A moderately large shark with a heavy, spindle-shaped body and a sharply pointed snout. Head with 5 long gill slits, all in front of pectoral fin origins; gill arches without rakers; spiracles very small; mouth long and broadly rounded; teeth moderately large and relatively few, nearly alike in both jaws, with a single, narrow, sharp-edged and backward-pointing cusp, without serrations and usually with basal cusplets absent in young below 1 m length, anterior teeth in 2 rows on each side of symphysis in both jaws, not compressed and triangular, with cusps nearly straight; intermediate teeth much smaller than anteriors, but first few lateral teeth only slightly smaller; 2 dorsal fins, the first very large, originating over inner margins of pectoral fins, the second very small; anal fin origin about under second dorsal origin; pectoral fins shorter than head and slightly falcate; caudal fin lunate, with lower lobe very strong. Caudal peduncle very much flattened dorso-ventrally, but expanded as a strong lateral keel that extends well out onto the caudal fin, and is flanked below by a secondary keel on the caudal base.

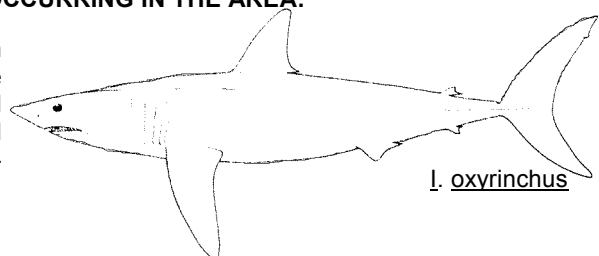


underside of head

Colour: blue-grey above, abruptly white on sides and lower surface, pectoral fins dusky, rear tip of first dorsal white, no black spot on pectoral axils.

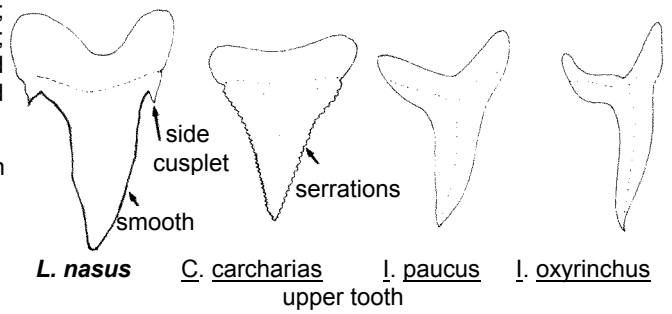
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Isurus species: body usually slimmer; teeth without cusplets, the anteriors larger and flexed, more differentiated from the laterals; origin of first dorsal fin posterior to inner corners of pectoral fins, anal fin origin posterior to that of second dorsal; no secondary keels on caudal fin.

I. oxyrinchus

Carcharodon carcharias: adult size much larger; jaws and mouth bigger, snout blunter and broader; teeth serrated, the anteriors broadly triangular and compressed; anal fin origin posterior to base of second dorsal; no secondary keels on caudal fin.

No other sharks in the area have the combination of characters underlined above.



**SIZE:**

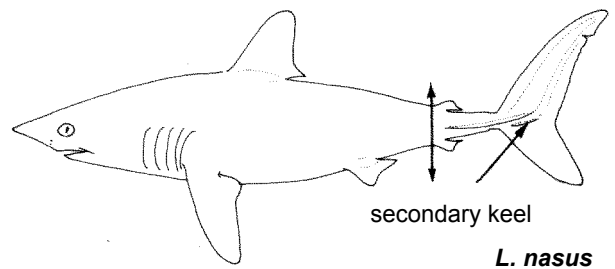
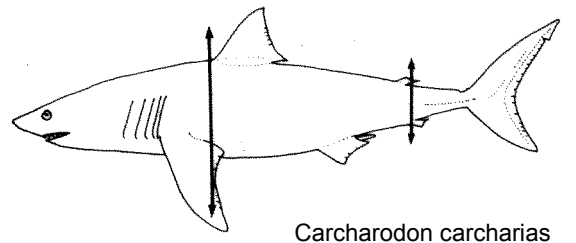
Maximum: to about 370 cm, but most adults below 260 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Distribution in the area poorly known, but apparently regularly occurring pelagically in the colder waters of the region, below 30°S, and possibly off the South African coast at Durban. Elsewhere in the Atlantic, Mediterranean Sea, Cape coast of South Africa, South-eastern Indian Ocean and Western and Eastern South Pacific.

A coastal and oceanic species inhabiting cold to warm-temperate waters. Strong-swimming and active when feeding, but otherwise sluggish and not leaping out of the water like Isurus oxyrinchus. Often found near the surface, but may reach at least 150 m depth. Ovoviviparous, number of young 1 to 5, size at birth about 61 cm.

Feeds on small pelagic schooling fishes, including mackerel and clupeoids; also bottom fish such as gadoids, flatfish, dories, small sharks, and squids. Regarded as potentially dangerous because of its size, but apparently not recorded as attacking people or boats (unlike Isurus oxyrinchus or Carcharodon carcharias).



**PRESENT FISHING GROUNDS:**

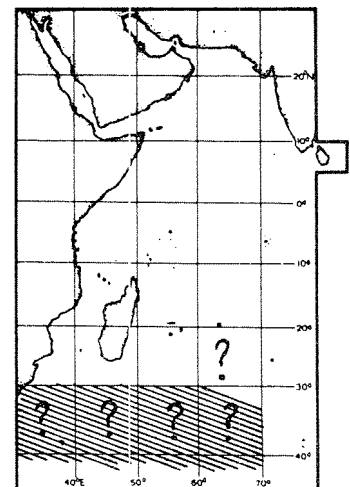
The southern oceanic part of the area but details lacking.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught on pelagic longlines, by Japanese longline boats.

Utilization not recorded.



FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

MITSUKURINIDAE

Goblin sharks

A single species in the area - see species sheets for:

Mitsukurina owstoni Jordan, 1898      MITSU Mitsu 1

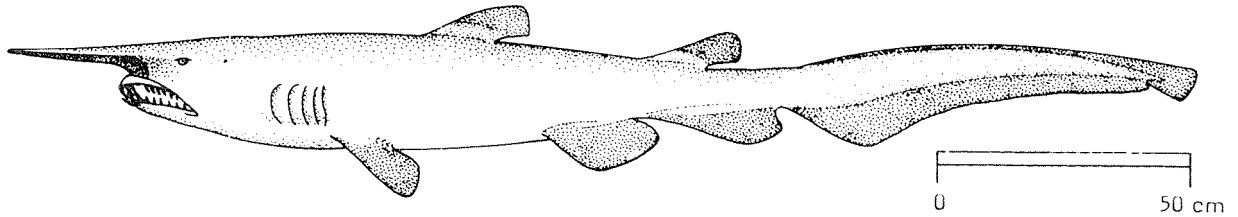
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: MITSUKURINIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Mitsukurina owstoni* Jordan, 1898

OTHER SCIENTIFIC NAMES STILL IN USE : *Scapanorhynchus owstoni* (Jordan, 1898)



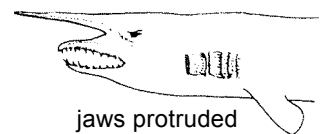
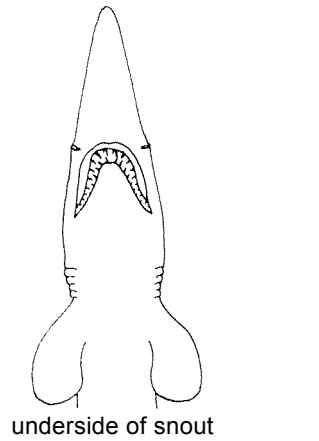
VERNACULAR NAMES:

FAO : En - Goblin shark  
Fr - Requin lutin  
Sp - Tiburón duende

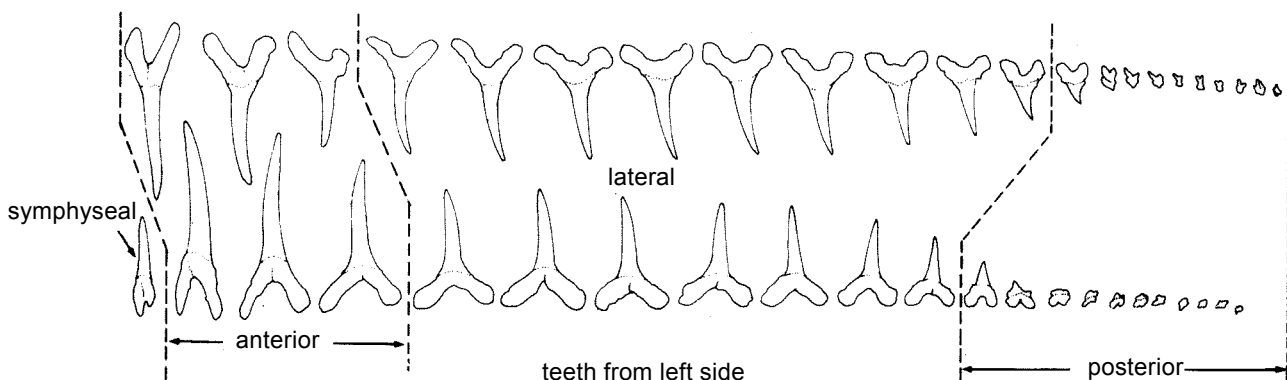
NATIONAL:

DISTINCTIVE CHARACTERS:

A moderately large, very soft-bodied, flabby shark. Head with 5 medium-sized gill slits, all in front of pectoral fin bases, their upper ends not extending onto dorsal sides of head; no gillrakers; spiracles present but very small; no nasal barbels or nasoral grooves; eyes very small on sides of head, without nictitating eyelids; snout very long and flat, formed as a narrow, pointed blade; mouth long and angular, extending well behind eyes when jaws are not protruded), but capable of moving in front of eyes when jaws are thrust forward to level of snout tip; lower labial furrows present; anterior teeth large, with long, extremely narrow, hooked, sharp-edged but unserrated cusps and no cusplets, set in 3 rows on either side of symphysis in both jaws; upper anteriors separated from the smaller laterals by a gap (no small intermediate teeth). Two low, equally large dorsal fins, the first closer to the pectorals than to the pelvics, its base well in front of the latter and much shorter than caudal fin; anal fin low, rounded, and larger than dorsal fins; caudal fin long but much less than half the total length, strongly asymmetrical, without a well-developed lower lobe. Caudal peduncle without keels or precaudal pits. Intestinal valve of ring type, with the turns closely packed like a stack of washers.



Colour: pinkish-white to light grey on body, fins and gill region dusky.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The combination of characters described above, readily distinguishes this species from all others occurring in the area

**SIZE:**

Maximum: about 264 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

An uncommon, deep-water, bottom-dwelling shark with a spotty but wide distribution in continental waters. In the area, it is found in deep water off South Africa but may be more wide-ranging. Elsewhere, off France, Portugal, Senegal, the Gulf of Guinea and the Cape of Good Hope, South Africa in the Eastern Atlantic, in the Western North Atlantic (off French Guiana), and in the Western Pacific (off Japan and Australia).

Apparently inhabiting the outer continental shelves and upper slopes down to at least 550 m, but occasionally taken in shallow waters. Habits poorly known, probably ovoviviparous.

Probably preys on small fishes, squids, and crustaceans.

**PRESENT FISHING GROUNDS:**

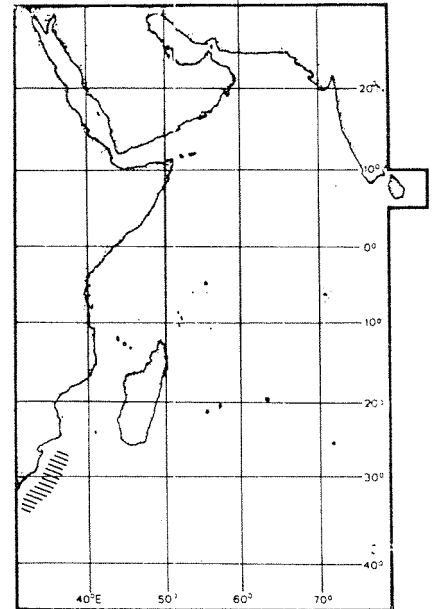
Accidental or rare offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls.

Utilization unrecorded.



FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

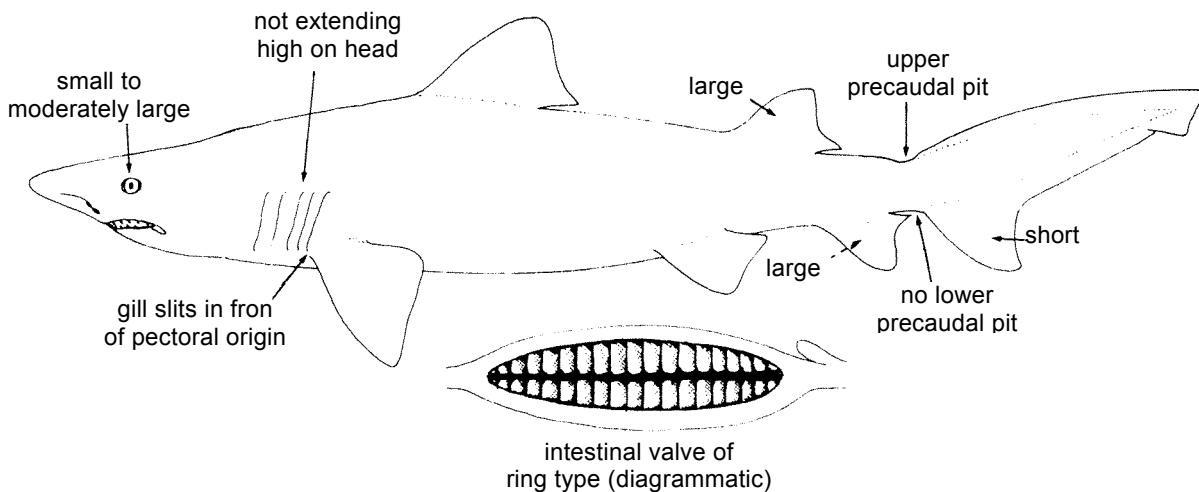
ODONTASPIDIDAE

Sand tiger sharks

Large sharks. Head with 5 medium-sized gill slits, all in front of pectoral fin bases, their upper ends not extending onto dorsal surface of head; gill arches without rakers; spiracles present but very small; no nasal barbels or nasoral grooves; eyes small or moderately large, without nictitating eyelids; snout conical or moderately depressed, not bladelike; mouth very long and angular, extending well behind eyes when jaws are not protruded; lower labial furrows usually present at mouth corners\* anterior teeth enlarged, with long, narrow, sharp-edged but unserrated cusps and small basal cusplets absent in young of (at least one species), the upper anteriors separated from the laterals by a gap and tiny intermediate teeth. Two moderately large, high dorsal fins, the first originating well in advance of the pelvics, the second as large as or somewhat smaller than the first; anal fin as large as second dorsal or slightly smaller; caudal fin short, asymmetrical, with a strong subterminal notch and a short but well marked ventral lobe. Caudal peduncle not depressed, without keels; a deep upper precaudal pit present but no lower pit. Intestinal valve of ring type, with turns closely packed like a stack of

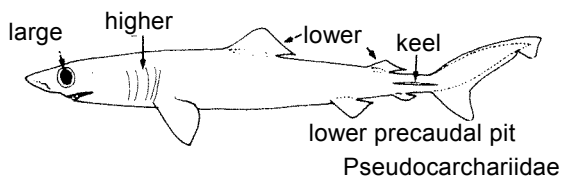
Colour: grey or grey-brown above, white or lighter below, with round or oval spots on at least one species.

These are wide-ranging, tropical to cool-temperate sharks, found inshore and down to moderate depths on the edge of the continental shelves and around some oceanic islands, but not oceanic. They feed on small bony fishes, other sharks, squids and occasionally bottom crustaceans. Normally inoffensive, but potentially dangerous if provoked. In the area, at least one species is regularly caught for food, liver oil, and processed for fishmeal.

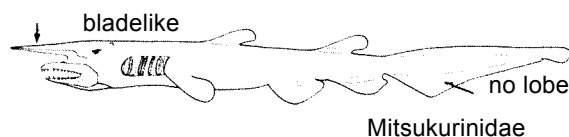


**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Pseudocarchariidae: body slimmer, gill slits higher and reaching onto dorsal sides of head, eyes larger, no true labial furrows, dorsal and anal fins lower, a weak lateral keel on caudal peduncle and both upper and lower precaudal pits present.



Mitsukurinidae: body very soft and flabby (Odontaspidae with firmer muscles and tougher skin), snout extremely elongated, flattened and bladelike, anal fin broadly rounded (angular in Odontaspidae); no lower lobe on caudal fin, and no precaudal pits.



\*Possibly absent in Euclomphodus tricuspidatus



Proscylliidae, Triakidae, Hemigaleidae and Carcharhinidae: nictitating eyelids present, anterior teeth not greatly enlarged, no intermediate teeth between anteriors and laterals, intestinal valve of spiral or scroll type.

**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

1a. Snout short and somewhat flattened (Fig.1a); eyes very small; 3 rows of anterior teeth on either side of upper symphysis (Fig.2a); dorsal and anal fins about equal in size; first dorsal fin closer to pelvic than to pectoral bases (Fig.3) ..... Eugomphodus

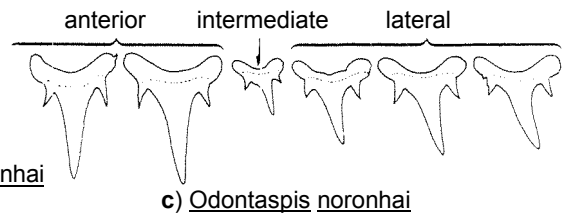
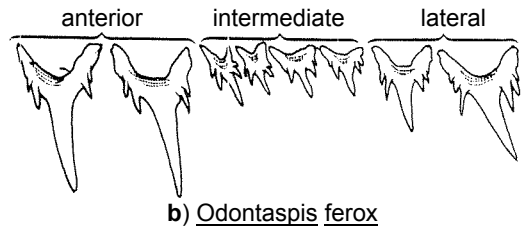
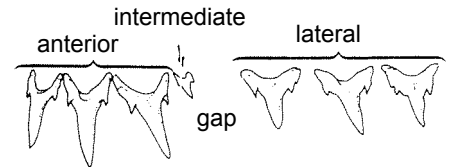
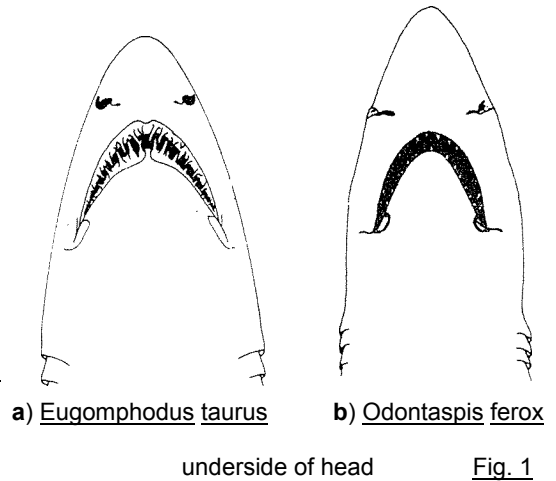
2a. Snout narrowly rounded in dorsoventral view; labial furrows present..... Eugomphodus taurus

2b. Snout broadly rounded in dorsoventral view; labial furrows absent....Eugomphodus tricuspoidatus

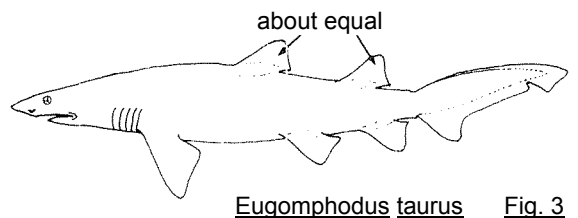
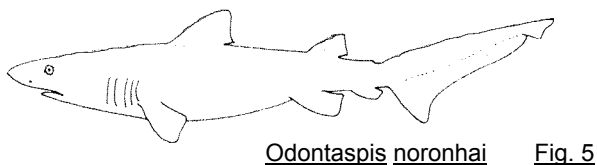
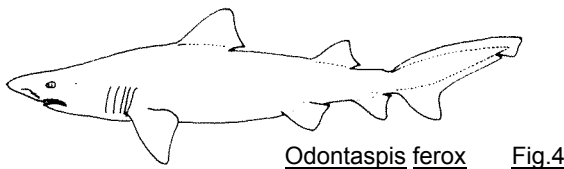
1b. Snout longer, bulbous and conical (Fig.1b); eyes relatively large; 2 rows of large anterior teeth on either side of upper symphysis (Fig. 1b,c); first dorsal fin markedly larger than the second, closer to pectoral than to pelvic bases; second dorsal considerably larger than anal fin (Figs 4,5).....Odontaspis

3a. Teeth mostly with 2 or 3 cusplets on each side; 3 or 4 rows of small intermediate teeth between upper anteriors and laterals (Fig.1b); second dorsal fin origin over or slightly posterior to insertion of pelvic fins, colour medium grey above, light below (Fig.4) ..... Odontaspis ferox

3b. Teeth with only one cusplet on each side; one row of small intermediate teeth between upper anteriors and laterals (Fig.2c); origin of second dorsal fin over midbase of pelvics; colour dark chocolate-brown above and below (Fig.5) .. Odontaspis noronhai



upper front teeth Fig.2



**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

* <u>Eugomphodus taurus</u> (Rafinesque, 1810)	ODONT Eug 1
** <u>Eugomphodus tricuspидatus</u> (Day, 1878) ?	
*** <u>Odontaspis ferox</u> (Risso, 1810)	ODONT Odont 1
**** <u>Odontaspis noronhai</u> Maul, 1955 ?	

Prepared by L.J.V. Compagno, Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, California, U.S.A.

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\* This species is often placed in Odontaspis, but external and anatomical studies show that it is very distinct and rates generic separation

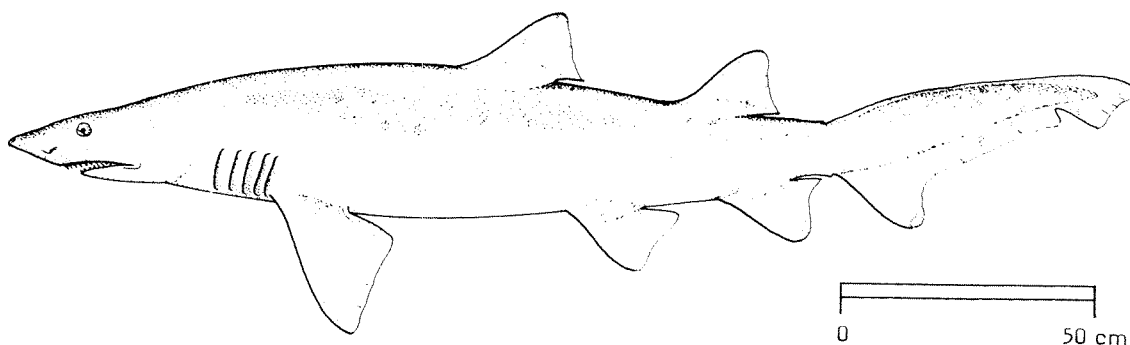
\*\*This species is very poorly known, and may be a synonym of E. taurus. Characters separating it from E. taurus are from its original description and may be incorrect. The holotype of E. tricuspидatus is apparently lost (P.K. Talwar, personal communication)

\*\*\*Sometimes considered as 2 species, O. herbsti Whitley, 1950, and O. ferox

\*\*\*\*Possible record of this species from the area, off the Seychelles (jaws only), but locality of capture uncertain (D. Ward, personal communication)

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: ODONTASPICIDAE

FISHING AREA 51  
(W. Indian Ocean)Eugomphodus taurus (Rafinesque, 1810)OTHER SCIENTIFIC NAMES STILL IN USE : Odontaspis taurus (Rafinesque, 1810)

## VERNACULAR NAMES:

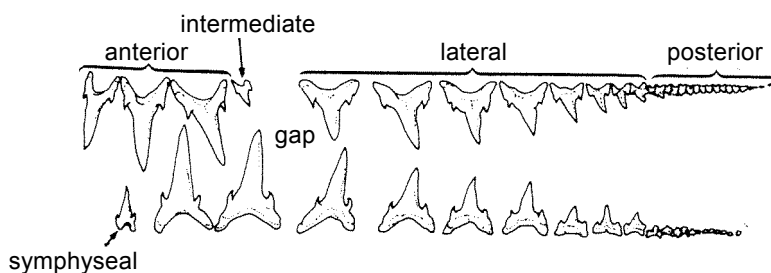
FAO : En - Sand tiger shark  
Fr - Requin taureau (= Requin sable tacheté, Area 31)  
Sp - Toro bacota (= Pez toro)

NATIONAL:

## DISTINCTIVE CHARACTERS:

A large shark. Head with 5 medium to large gill slits, all in front of pectoral fin bases; no gill-rakers; snout very short, moderately flattened; no nasal barbels or nasoral grooves; eyes small, without nictitating eyelids; mouth very long and angular, extending well behind eyes; anterior teeth in 3 rows on either side of symphysis, large, with long, narrow, hooked, sharp-edged but non-serrated cusps and usually one short cusplet on each side; upper anteriors separated from the smaller laterals by a single row of tiny intermediate teeth (lacking in lower jaw); lower anteriors separated at front by 2 rows of small symphyseal teeth (generally lacking in upper jaw). Two dorsal fins, the base of first just in front of pelvic fin bases and well posterior to pectoral fins; second dorsal about as large as first dorsal and as anal fin; caudal fin short, strongly asymmetrical, with a pronounced subterminal notch and a short ventral lobe. No keels on caudal peduncle, but with a strong upper precaudal pit. Intestinal valve of ring type.

Colour: light grey-brown above, white below, often with round or oval, yellow or yellow-brown spots.

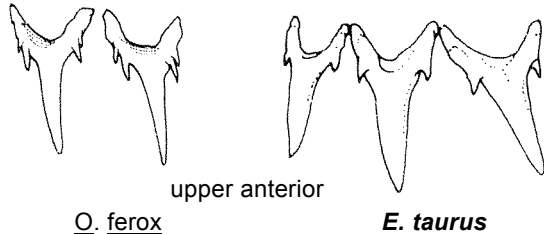


upper and lower teeth of one side

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Eugomphodus tricuspidatus: this poorly known species is said to differ from E. taurus in lacking labial furrows and in having a more rounded snout, but these characters may be in error as the species was described from a skin (now lost); E. tricuspidatus may be a junior synonym of E. taurus.

Odontaspis ferox and O. noronhai: snout more elongated and conical. eyes larger, 2 rows of large anterior teeth in upper jaw on either side of symphysis. small symphyseal teeth present in both upper and lower jaws, first dorsal fin well in front of pelvic fins. closer to pectorals, larger than second dorsal, the latter larger than anal fin.



upper anterior

O. ferox

E. taurus

**SIZE :**

Maximum: about 318 cm. most adults between 220 to 280 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Range in the area uncertain because of many records of E. tricuspidatus that may be based on E. taurus provided E. tricuspidatus itself is not a synonym of E. taurus; definitely recorded from South Africa and Mozambique, probably Red Sea, Oman, the "Gulf" and Pakistan, and possibly India. Elsewhere, wide-ranging in the Atlantic, Mediterranean Sea and Western Pacific.

A common coastal species in and outside bays, usually near the bottom. Slow but strong-swimming. very active. Females undergo yearly migrations in waters off South Africa and Mozambique. going south to cool-temperate waters to drop their young in the early spring, and returning to tropical waters in the north during the summer. Ovoviviparous. usually with 2 young, one to each uterus, but occasionally only one; size at birth between 95 and 100 cm. reported for the area. but elsewhere up to at least 120 cm.

Feeds on a variety of small bony fishes. including sea catfishes, flatheads, flatfish. and jacks. also small sharks and rays, squid and occasionally crabs and lobsters. Normally inoffensive. though potentially dangerous if provoked and aggressive to divers when stimulated by speared fish.

**PRESENT FISHING GROUNDS:**

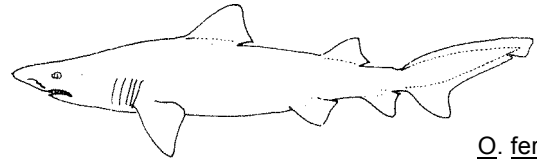
Definitely off Pakistan, and probably the Red Sea. Often taken by sports anglers off South Africa.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

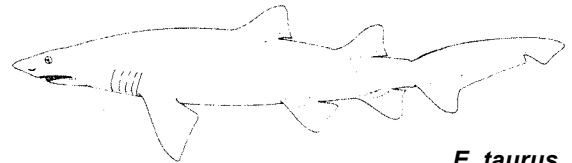
Separate statistics are not reported for this species.

Caught with line gear, probably also with gillnets.

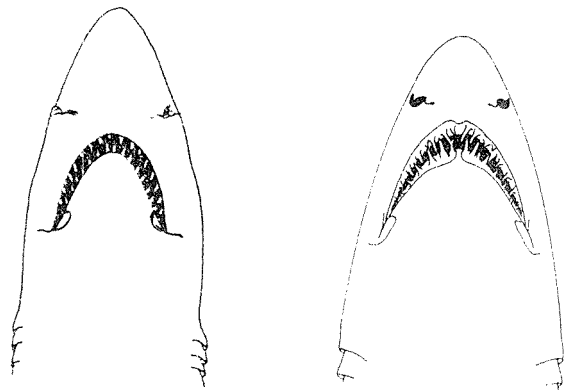
Utilized fresh for human consumption.



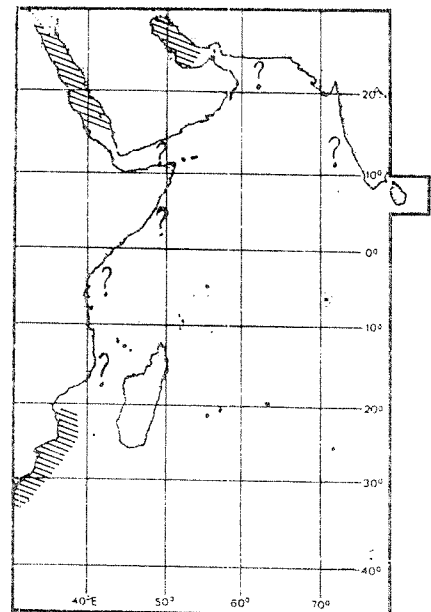
O. ferox



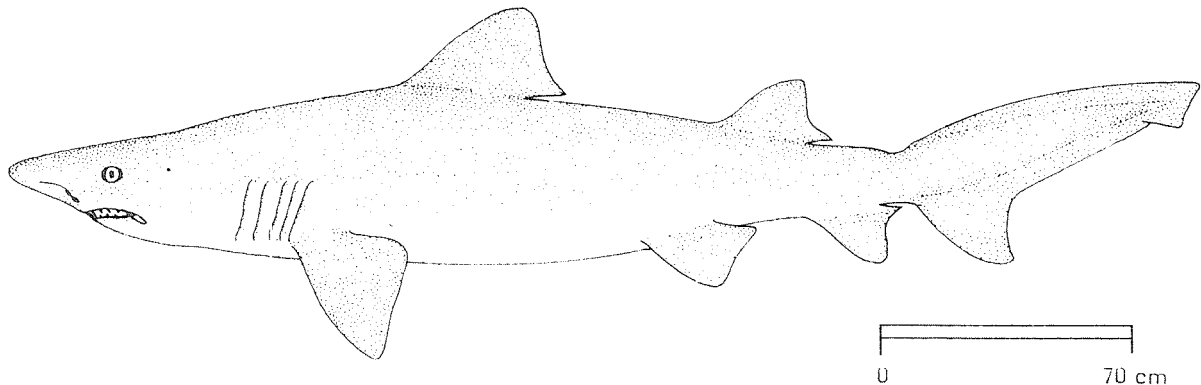
E. taurus



underside of head



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)Odontaspis ferox (Risso, 1810)OTHER SCIENTIFIC NAMES STILL IN USE : Odontaspis herbsti Whitley, 1950

## VERNACULAR NAMES:

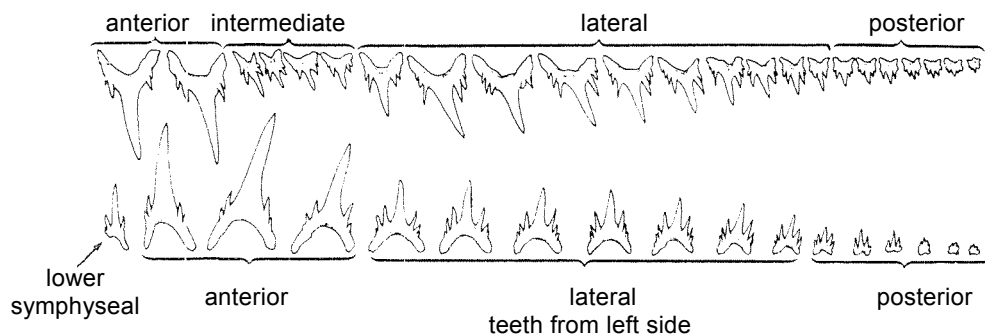
FAO :           En - Smalltooth sand tiger  
                   Fr - Requin féroce  
                   Sp - Solrayo

NATIONAL :

## DISTINCTIVE CHARACTERS :

A large shark. Head with 5 medium to large gill slits, all in front of pectoral fin bases; no gill-rakers; snout moderately elongated, bulbously conical; no nasal barbels or nasoral grooves; eyes moderately large, without nictitating eyelids; mouth very long and angular, extending well behind eyes; anterior teeth moderately large, with long, narrow, hooked, sharp-edged but non-serrated cusps and 2 or 3 moderately long cusplets on each side, separated in front by 2 rows of small symphyseal teeth in both jaws; upper anteriors set in 2 rows on either side of symphysis and separated from the smaller laterals by 3 or 4 rows of tiny intermediate teeth; lower anteriors set in 3 rows on either side of symphysis and not followed by small intermediate teeth. Two dorsal fins, the first large and situated closer to the pectorals than to the pelvics, its free rear tip well ahead of pelvic fin origins, the second dorsal fin smaller than the first and usually slightly larger than anal fin; caudal fin short, strongly asymmetrical, with a pronounced subterminal notch and a short ventral lobe. No keels on caudal peduncle, but a strong upper precaudal pit. Intestinal valve of ring type.

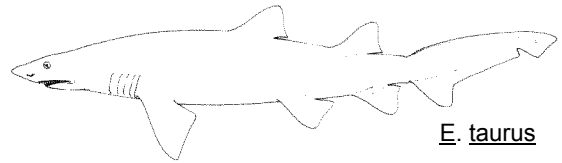
Colour: grey above, paler below, tips of dorsal, anal, pectoral and pelvic fins may be dark-tipped in young; dark spots present on sides in some individuals.



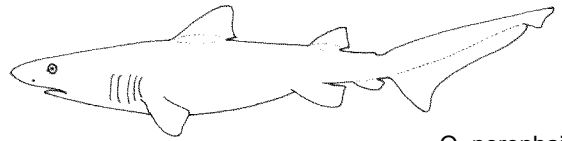
**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Odontaspis noronhai: a little-known, deepwater species only recorded from off Madeira and possibly the Seychelles. Teeth with only one cusplet on each side; upper anteriors separated from the laterals by a single row of small intermediate teeth; second dorsal origin over midbase of pelvic fins (over or posterior to the insertions of the pelvic fins in O. ferox); colour chocolate-brown.

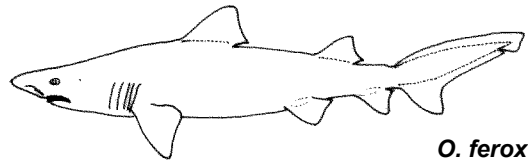
Eugomphodus taurus and E. tricuspidatus (if distinct from E. taurus): snout short and flattened, eyes smaller; teeth relatively larger, with a single, very low cusplet on each side; upper anteriors set in 3 rows on either side of symphysis, not separated in front by small symphyseal teeth, but separated from the laterals by a single row of intermediate teeth; dorsal and anal fins about equal in size; first dorsal much closer to the pelvic than to the pectoral fin bases, with its free rear tip about over the pelvic origins.



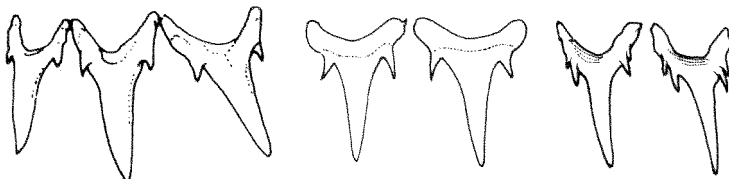
E. taurus



O. noronhai



O. ferox



E. taurus

O. noronhai

O. ferox

upper anterior teeth

**SIZE:**

Maximum: about 360 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

A wide-ranging bottom-dwelling shark found in the area off South Africa, probably also northeast of Madagascar, and to be expected elsewhere in the area. Also from the Eastern Atlantic, Mediterranean Sea, Western, Central and Eastern Pacific. Unspotted individuals have been distinguished as O. herbsti, but spotting seems to be a matter of individual variation in one species.

A little-known species found at depths between 15 and 420 m from inshore waters to over the edge of the continental shelf. Probably ovoviviparous.

Feeds on small bony fishes, squids and crustaceans.

**PRESENT FISHING GROUNDS:**

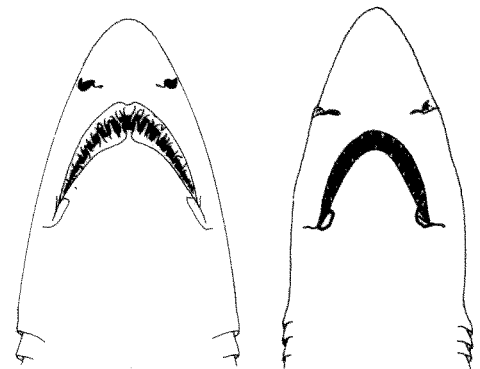
Uncertain.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :**

Separate statistics are not reported for this species.

Caught incidentally in trawls in the area.

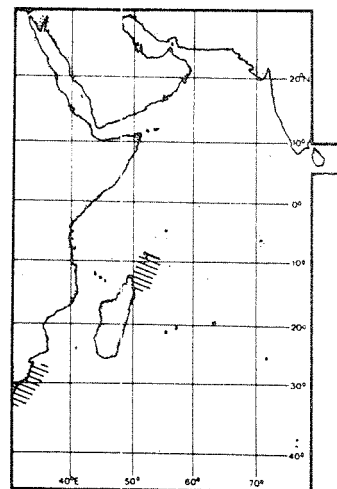
Mode of utilization uncertain.



E. taurus

O. ferox

underside of head



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

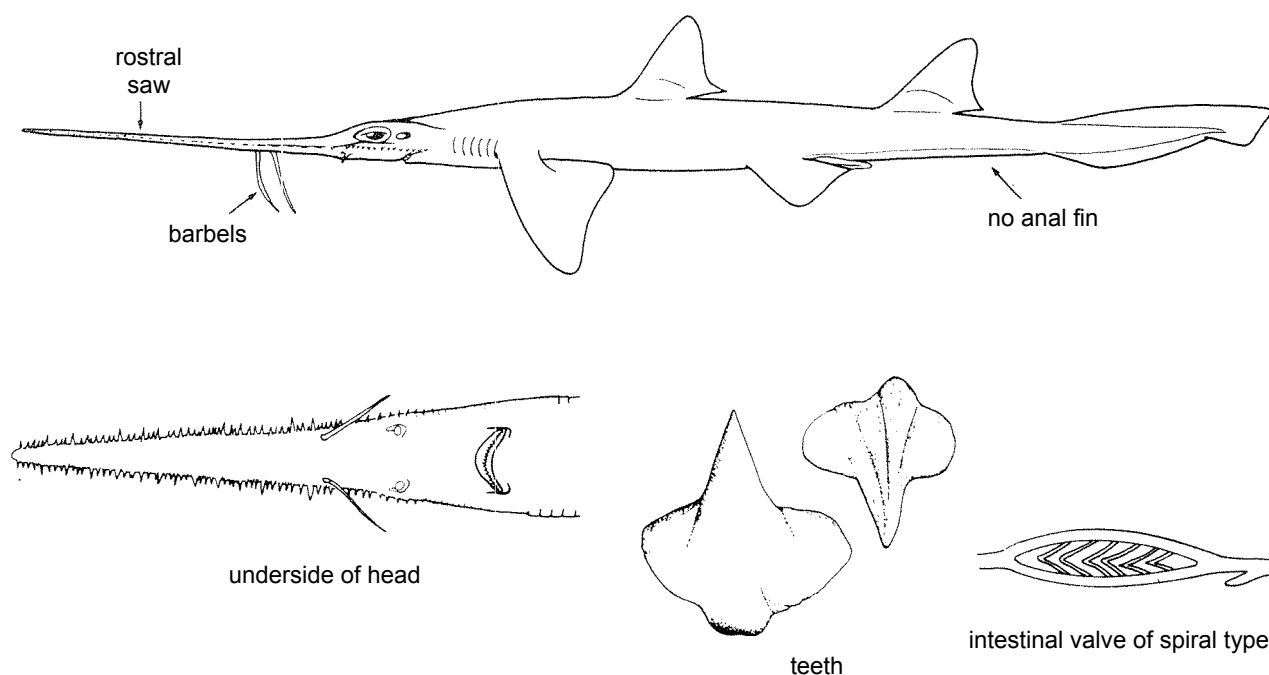
## PRISTIOPHORIDAE

## Sawsharks

Small sharks. Trunk and precaudal tail cylindrical to somewhat depressed, trunk without lateral ridges but tail with long lateral folds, reaching caudal fin; precaudal tail about as long as trunk. Head not expanded laterally, considerably depressed; 5 or 6 small gill slits present, all in front of the pectoral fin origins, their upper ends not expanded onto upper surface of head; no gill sieves or complex rakers on internal gill slits; spiracles present and very large, behind eyes; nostrils without barbels, nasoral grooves or circumnarial grooves, far anterior to mouth; eyes dorsal on head, without nictitating eyelids; snout extremely long, depressed and bladeliike, with lateral teeth and unique rostral barbels in front of nostrils; mouth small, short, transversely arched, and well behind eyes; labial furrows very short, confined to mouth corners; teeth small, not bladeliike, with a single low cusp, similar in upper and lower jaws and weakly differentiated along the jaws. Two dorsal fins, without spines, the first dorsal moderately large, high and angular, much shorter than the caudal fin, and with its base nearly equidistant between pectoral and pelvic fin bases; second dorsal fin about as large as first; anal fin absent; caudal fin strongly asymmetrical, much less than half of total length, without a rippled or undulated dorsal margin but with a strong subterminal notch; lower lobe not present or very short; vertebral axis of caudal fin slightly raised above body axis. Caudal peduncle depressed, without precaudal pits but with low lateral folds continuing from precaudal tail. Intestinal valve of spiral type.

Colour: uniform brown above, white below, fins dusky, no colour pattern.

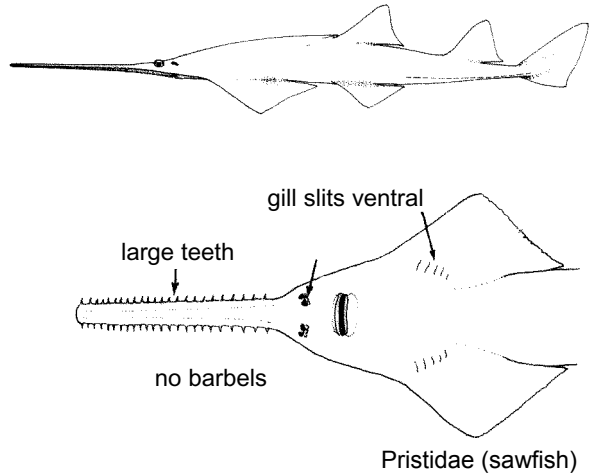
These are moderately abundant, primarily deepwater sharks, found on the outer continental shelves and upper slopes down to 915 m, sometimes inshore in shallow water. They probably use their rostral saws to injure and kill small fishes and crustacea, much as do the batoid sawfishes (Pristidae). They have a disjunct distribution at present from the Western Pacific, Western Indian Ocean, and Western North Atlantic, but were formerly almost worldwide. They are fished for food, particularly in the Australian region, but also in the Western North Pacific. Harmless sharks, not exceeding 1.4 m total length.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

No other sharks in the area have a rostral saw with barbels.

Sawfishes (Pristidae, a family of batoid fishes) are common in the area and also have a rostral saw, but differ from the sawsharks in having the pectoral fins expanded anteriorly over the gill openings and fused to the sides of the head, so that the head and pectoral fins form a distinct pectoral disc with the gill openings ventral (as in other batoids); additionally, the trunk is shorter and more depressed, the first dorsal fin is partially or entirely above the pelvic fin bases, the rostral saw has relatively few, uniformly large, continuously growing teeth (small, varying in size along the rostrum, and not growing, but periodically replaced in Pristiophoridae) and no barbels. Furthermore, the species of sawfishes are much larger, reaching 6 m or more.



**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

- 1a. Six pairs of gill openings; largest rostral teeth serrated ..... Pliotrema warreni
- 1b. Five pairs of gill openings; largest rostral teeth not serrated ..... Pristiophorus sp.\*

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Pliotrema warreni Regan, 1906

PRISTIOP Plio 1

\*Pristiophorus species

Prepared by L.J.V. Compagno, Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, California, USA

\* Dr. Bruce Welton (personal communication) examined a specimen of Pristiophorus from Pakistan, apparently collected in the northern Arabian Sea. The identity of this specimen is uncertain at present

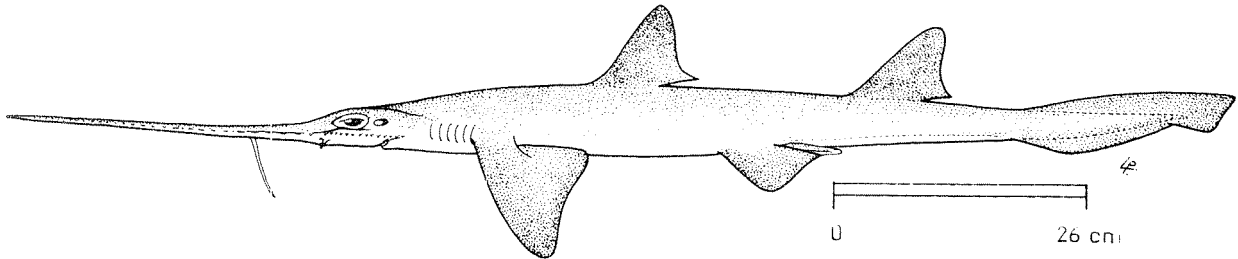


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PRISTIOPHORIDAE

FISHING AREA 51  
(W, Indian Ocean)Pliotrema warreni Regan, 1906

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

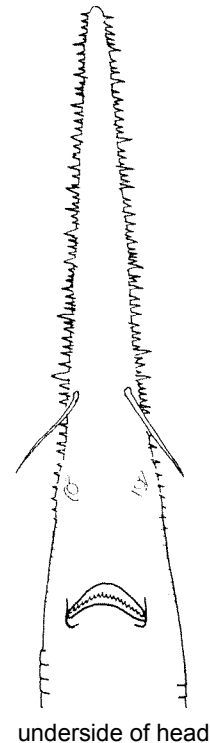
FAO : En - Sixgill sawshark  
Fr - Requin scie flutien  
Sp - Tiburón sierra del Cabo

NATIONAL:

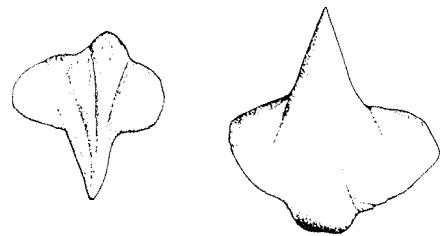
## DISTINCTIVE CHARACTERS:

A small shark. Body moderately depressed. Head with 6 pairs of small gill openings, the last in front of pectoral fin origins; no gillrakers; mouth small, short and arcuate, located far posterior, behind eyes; snout extremely long, greatly flattened, with enlarged pointed dermal denticles along sides forming the teeth of a rostral saw and a pair of long barbels on its ventral surface in front of nostrils; largest rostral teeth serrated; nostrils without barbels or nasoral grooves; teeth very small, not bladelike, with one conical cusp, alike in both jaws. Two moderately large dorsal fins, without spines, the first on back between pectoral and pelvic fins, the second as large as first; pectoral fins broad and moderately large; anal fin absent; caudal fin much less than half the total length, asymmetrical, with a subterminal notch and no lower lobe. No precaudal pits, but a long low dermal fold or keel extending on precaudal tail from pelvic fins to base of caudal fin on each side.

Colour: light brown above, white below, fins dusky.



underside of head

upper tooth and lower tooth  
near centre

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Another sawshark, Pristiophorus species, apparently occurs in the northern Arabian Sea off Pakistan (Dr. B. Welton, personal communication). This differs from Pliotrema warreni in having only 5 pairs of gill openings.

No other sharks or batoids in the area combine the characters of a rostral saw, rostrala barbels, no anal fin and 6 pairs of gill openings.

**SIZE:**

Maximum: about 136 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Virtually confined to the area, off South Africa (Natal) and southern Mozambique; also Cape coast of South Africa.

A common shark of moderate depths, taken near the bottom in water 60 to at least 430 m deep. Ovoviviparous, number of developing eggs in uterus 7 to 17, but the few litters of young reported ranged from 5 to 7 individuals; size at birth about 36 cm.

A small, harmless shark, feeding on small bottom fish, crustaceans and squid.

**PRESENT FISHING GROUNDS:**

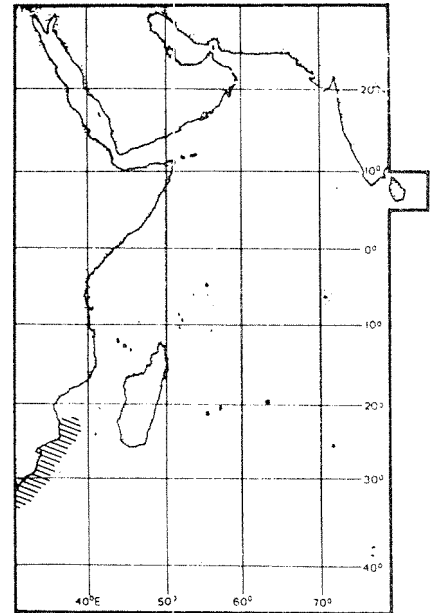
South Africa and southern Mozambique.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with bottom trawls.

Mode of utilization uncertain, probably limited at best.



FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

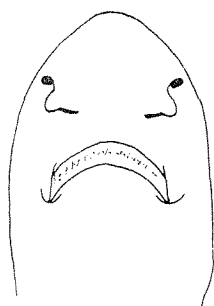
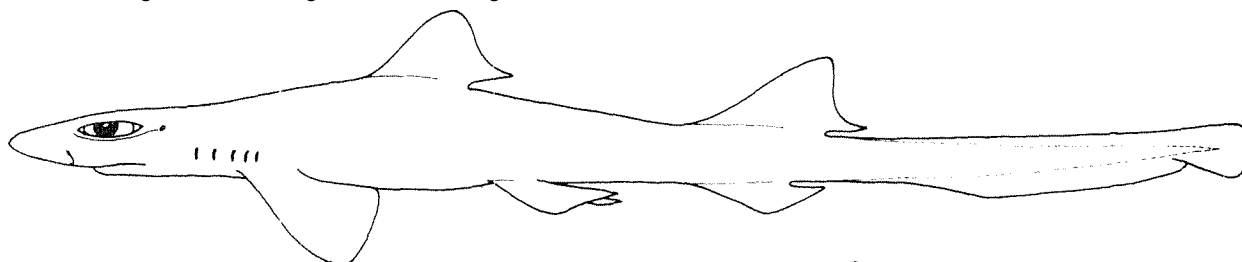
PROSCYLLIIDAE

Finback catsharks

Small sharks. Trunk and precaudal tail cylindrical or somewhat compressed, not depressed and without lateral ridges; precaudal tail much shorter than head and trunk. Head not expanded laterally, moderately depressed; 5 small gill slits present, the last 2 or 3 over the pectoral fin bases, their upper ends not expanded onto upper surface of head small gillraker papillae on internal gill slits; spiracles moderately large and behind eyes; nostrils without barbels, rasoral grooves, or circumnarial grooves, well separated from mouth; eyes dorsolateral on head, with weakly differentiated nictitating lower eyelids; snout short to moderately long, depressed and parabolic or narrowly rounded, not greatly flattened and bladelike and without lateral teeth and barbels; mouth moderately large, arched and elongated, and extending behind front margins of eyes; very short labial furrows present on both jaws or absent; teeth similar in upper and lower jaws, not enlarged toward front of mouth, small, with a sharp primary cusp and one or more cusplets on either side of it, posterior teeth comb-shaped. Two dorsal fins, without spines, small, moderately high and angular or subangular, much shorter than the caudal fin, and with its base located over the interspace between pectoral and pelvic fin bases, but closer to the pelvic bases than to the pectorals; second dorsal fin about as large as first dorsal; anal fin moderately large, with its origin slightly in front or slightly behind second dorsal origin but well in front of midpoint of second dorsal fin base; caudal fin asymmetrical, much less than half of total length, without a rippled dorsal margin a ventral lobe but with a strong subterminal notch; vertebral axis of caudal fin little raised above body axis. Caudal peduncle cylindrical or compressed, without keels or precaudal pits. Intestinal valve of spiral type.

Colour: grey or brown above, white or lighter below, either plain, with dark stripes on the caudal fin, or with a spotted or blotched colour pattern.

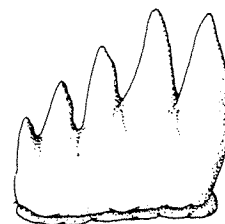
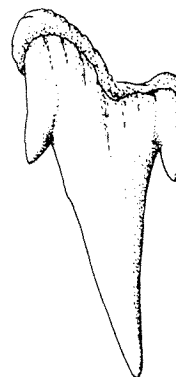
This is a small family of deepwater sharks with a disjunct distribution in tropical to warm-temperate waters of the Western North Atlantic, Indian Ocean and Western Pacific. The species live on the outer continental and insular shelves and upper slopes on or near the bottom; food consists of small fishes and invertebrates. Some may be common in the area and are taken in trawls, but their small size makes these sharks unsuitable for fisheries utilization other than for fishmeal. Utilization in the area unknown; separate statistics are not reported for this family. One species, Eridacnis radcliffei, is one of the smallest known sharks, with females maturing at about 15 cm total length and reaching a maximum length of 24 cm.



underside of head



intestinal valve of spiral type



upper and lower tooth

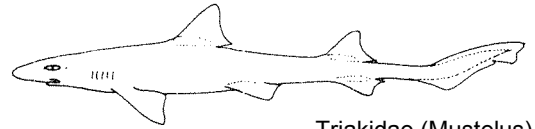
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Scyliorhinidae: first dorsal fin over or behind pelvic fin bases.



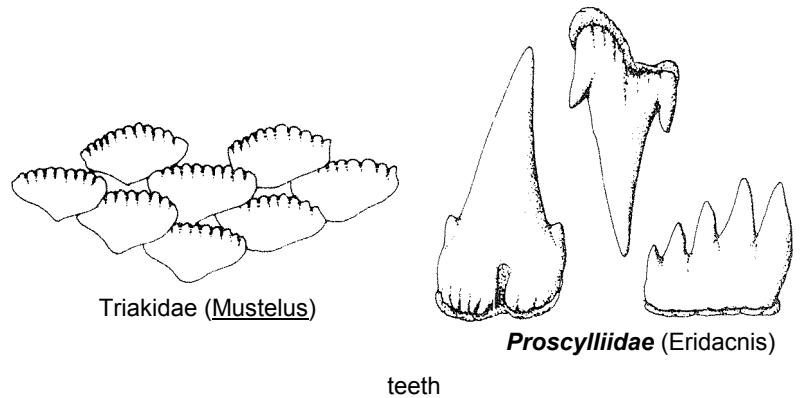
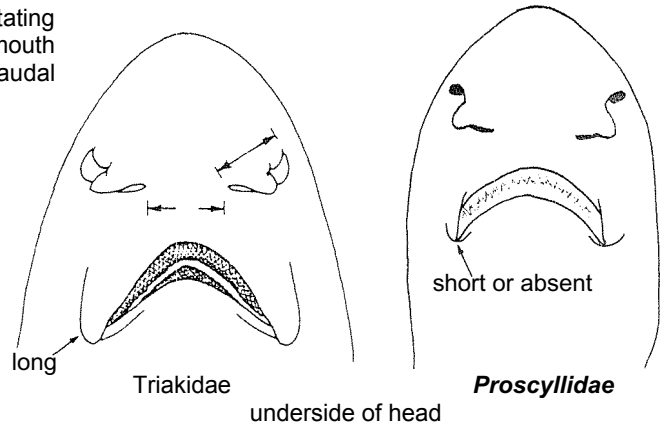
Scyliorhinidae (Atelomycterus)

Triakidae: no gillraker papillae on internal gill openings; nictitating lower eyelids better differentiated, with a deeper subocular pocket and a well-developed secondary lower eyelid edge, labial furrows long; teeth stouter, with heavier cusps or no cusps, posterior teeth not comblike; first dorsal fin base in species from the area more anterior, closer to the pectoral fin bases than to the pelvics or about equidistant between the two.



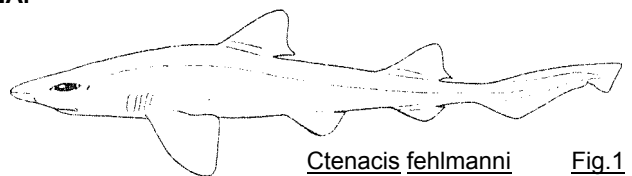
Triakidae (Mustelus)

No other sharks in the area combine nictitating lower eyelids, small, cuspidate teeth in both jaws, mouth under eyes, intestinal valve or spiral type, no precaudal pits and no rippled dorsal caudal margin.



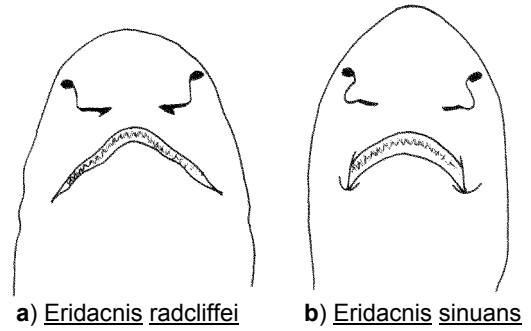
**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

- 1a. Caudal fin broad, not tapelike, and relatively short, its dorsal margin about 23% of total length; body relatively stout; colour pattern of spots, blotches and saddles on body and fins (Fig.1 ..... Ctenacis fehlmanni



Ctenacis fehlmanni Fig.1

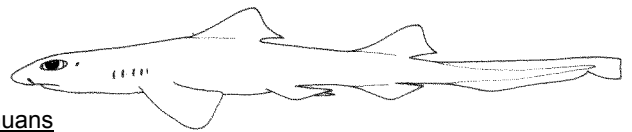
1b. Caudal fin narrow and tapelike, relatively long, its dorsal margin 25 to 30% of total length; body relatively slim; body and fins plain, except for dark or light edging on dorsal fins and dark and light barring on caudal fin (Figs 3,4) ..... Eridacnis



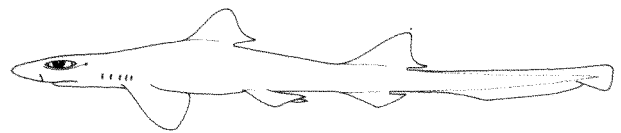
2a. Labial furrows vestigial or absent; snout length less than 1.5 times the mouth length (Fig.2a); anterior margin of first dorsal fin at a low angle to body axis (Fig.3) ..... Eridacnis radcliffei

underside of head      Fig.2

2b. Labial furrows extremely short but present on both jaws; preoral snout length over twice the mouth length (Fig.2b); anterior margin of first dorsal fin at a higher angle to body axis (Fig.4) ..... Eridacnis sinuans



Eridacnis radcliffei      Fig.3



Eridacnis sinuans      Fig.4

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Ctenacis fehlmanni (Springer, 1968)

Eridacnis radcliffei Smith, 1913

Eridacnis sinuans (Smith, 1957)

PSEUD

1983

**FAO SPECIES IDENTIFICATION SHEETS**

**FISHING AREA 51  
(W. Indian Ocean)**

PSEUDOCARCHARIIDAE

Crocodile sharks

A single species in the area - see species sheet for:

Pseudocarcharias kamoharai (Matsubara, 1936) PSEUD Pseud 1

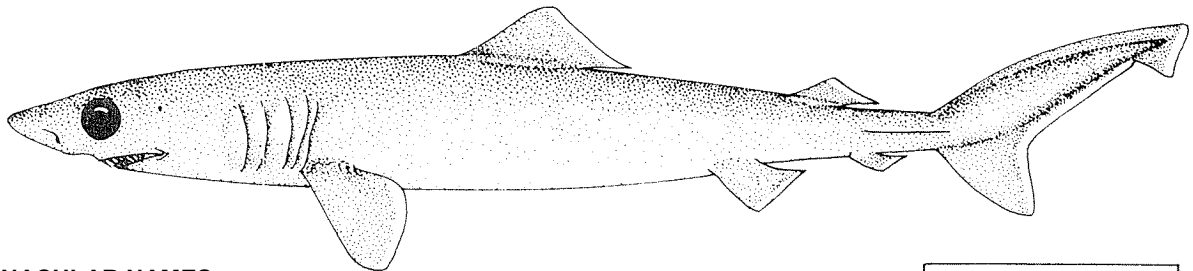
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PSEUDOCARCHARIIDAE

FISHING AREA 51  
(W. Indian Ocean)

Pseudocarcharias kamoharai (Matsubara, 1936)

OTHER SCIENTIFIC NAMES STILL IN USE : Odontaspis kamoharai (Matsubara, 1936)



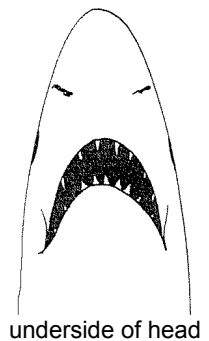
VERNACULAR NAMES:

FAO :           En - Crocodile shark  
                  Fr - Requin crocodile  
                  Sp - Tiburón cocodrilo

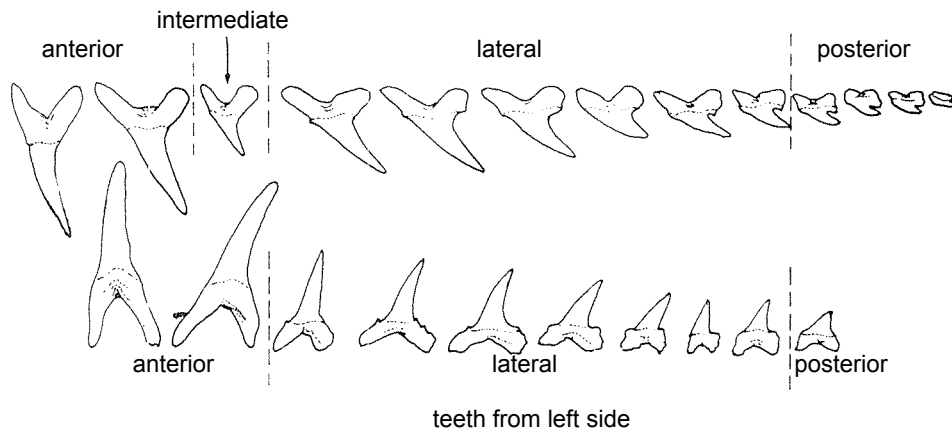
NATIONAL :

DISTINCTIVE CHARACTERS:

A small relatively slender shark. Head with 5 large gill slits, all in front of pectoral fin bases, their upper ends extending onto dorsal surface of head; no gillrakers; spiracles usually present but very small; no nasal barbels or nasoral grooves; eyes very large, without nictitating eyelids; snout conical (not greatly elongated or flattened and blade-like); mouth very long and angular, extending well behind eyes; no true labial furrows; anterior teeth very large, with long, narrow, hooked, sharp-edged but unserrated cusps and no cusplets, set in 2 rows on either side of symphysis in both jaws, and not separated in front by small symphyseal teeth; upper anteriors separated from the smaller laterals by a gap and tiny intermediate teeth. Two low dorsal fins, the first about midway between the pectorals and the pelvics, and well in front of pelvic fin bases, the second somewhat smaller than the first, but larger than anal fin; caudal fin short, strongly asymmetrical, with a pronounced subterminal notch and a short ventral lobe. Caudal peduncle slightly depressed, with a low keel on each side and upper as well as lower precaudal pits. Intestinal valve of ring type, with close-set turns resembling a stack of washers.



Colour: light or dark grey above, lighter below, fins white-edged, sometimes small white spots on body and a white blotch between the mouth and gill slits.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The combination of the characters described above separates this species from all other sharks in Fishing Area 51.

**SIZE:**

Maximum: about 110 cm, most adults between 75 to 100 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, known from southwest of Madagascar where it is reportedly common; probably more widespread in the area. An oceanic shark, possibly circumtropical in distribution, and otherwise known from the Eastern Atlantic, Northwestern, Central and Eastern Pacific.

Habits little known. Ovoviviparous, with litters of 4 young recorded, size at birth between 41 and 59 cm.

Probably feeds on small oceanic fishes and squid. Jaws can be protruded to a considerable distance forward from mouth.

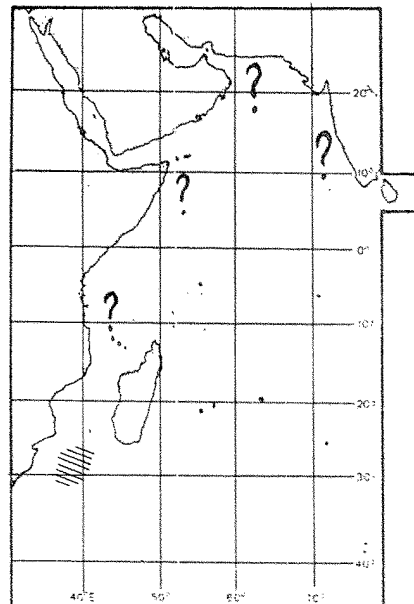
**PRESENT FISHING GROUNDS:**

Primarily offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught on pelagic longlines.





PSEUDOT

1983

FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

PSEUDOTRIAKIDAE

False catsharks

A single species in the area - see species sheet for:

Pseudotriakis microdon Capello, 1868      PSEUDOT Pseu 1

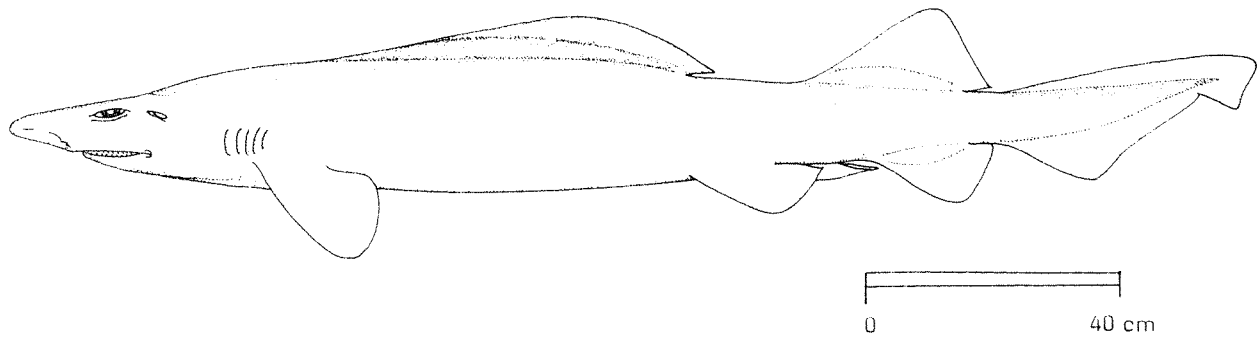
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PSEUDOTRIAKIDAE

FISHING AREA 51  
(W. Indian Ocean)

Pseudotriakis microdon Capello, 1868

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

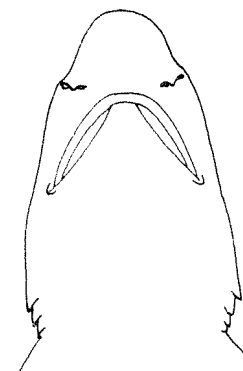
- FAO :           En - False catshark
- Fr - Requin à longue dorsale
- Sp - Musolón aleta larga

NATIONAL:

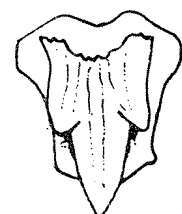
DISTINCTIVE CHARACTERS:

A large, soft-bodied shark. Head with 5 small gill slits, the last two over the pectoral fin bases; no dermal gillrakers; spiracles very large, about as long as eyes; nostrils without barbels or nasoral grooves; eyes above sides of head, horizontally elongated, with weakly differentiated nictitating lower eyelids that are delimited below the eyes by shallow pouches; snout moderately long, narrowly rounded; mouth very wide and long, extending behind front of eyes, angular in shape; labial furrows present but short, not extending forward to front of mouth; teeth extremely small and numerous, similar in both jaws and not bladelike, with a small primary cusp and one or more cusplets, becoming comblike in the rear of mouth; upper anterior teeth small and grading into the laterals, not separated from these by small intermediate teeth. Two dorsal fins, the first greatly elongated, low, keel-like, and broadly rounded above, its base just ahead of pelvic fin origins and as long as caudal fin; second dorsal fin short but higher than the first and larger than the anal fin; anal fin base under second dorsal base; caudal fin greatly asymmetrical, its lower lobe hardly developed, its upper edge not rippled and a subterminal notch present. Caudal peduncle not depressed, without lateral keels or precaudal pits. Intestinal valve presumably of spiral type.

Colour: dark brownish grey above and below, darker on posterior edges of pelvic, dorsal, anal and caudal fins.



underside of head



upper anterior tooth

### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

No other sharks in the area combine the presence of a low, keel-like first dorsal fin equal in length to the caudal fin and of an anal fin with the absence of fin spines.

### SIZE:

Maximum: 295 cm; females mature at about 210 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area known only from the Aldabra Island group in the southwestern Indian Ocean, but likely to be more widespread in the area. Elsewhere, in the Eastern North Atlantic from Iceland to Senegal, in the Western North Atlantic from New York and New Jersey, and in the Western Central Pacific (provided *P. acrales* is in junior synonym of this species).

A deepwater shark, normally occurring on the upper continental and insular slopes at depths between 300 and 1 500 m, rarely occurring in shallower water. Ovoviviparous, with litters of 2 young. Size at birth about 90 cm. Habits little known, once photographed in deep water eating a bony fish.

### PRESENT FISHING GROUNDS:

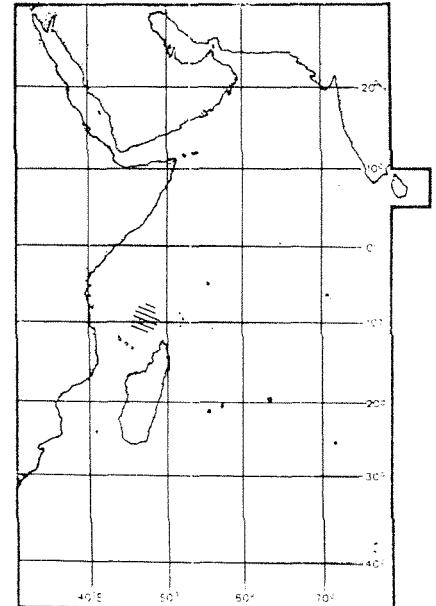
Probably taken incidentally offshore.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Taken in bottom trawls and on deep-set longlines.

Utilization not recorded.



RHIN

1983

FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

RHINIODONTIDAE

Whale sharks

A single species in the area - see species sheet for:

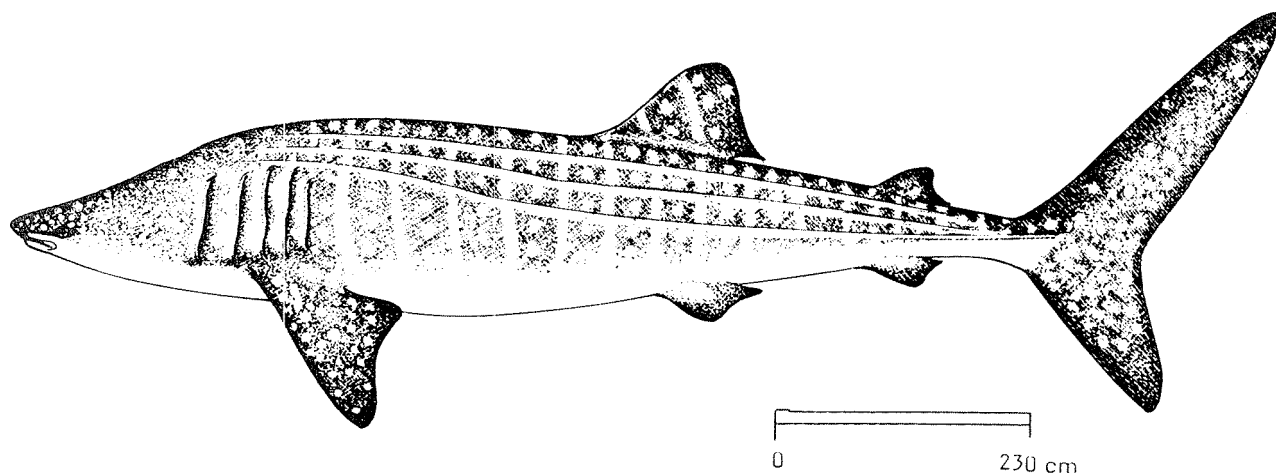
Rhiodon typus Smith, 1828      RHIN Rhin 1

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: RHINIODONTIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Rhiniodon typus</i> Smith, 1828
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OTHER SCIENTIFIC NAMES STILL IN USE: *Rhincodon typus* Smith, 1829

## VERNACULAR NAMES:

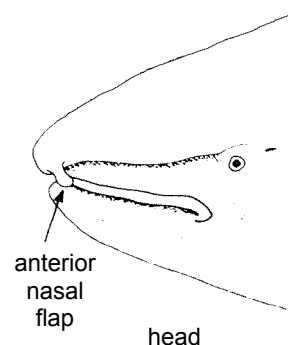
FAO :       En - Whale shark  
              Fr - Requin baleine  
              Sp - Tiburón ballena

NATIONAL:

## DISTINCTIVE CHARACTERS:

A very large shark. Head with 5 large gill slits, the posterior 3 over the pectoral fin bases; no gillrakers but filter grids of transverse bars and lobes across the internal gill slits; snout extremely short, truncated; nostrils with short, quadrate anterior nasal flaps, minute barbels, and shallow nasoral grooves; no nictitating eyelids; mouth nearly subterminal, very wide, transverse and short, not reaching backward to eyes; teeth very small and extremely numerous, similar in both jaws, not bladelike and with hooked cusps. Two dorsal fins, the first with rear third of base over pelvic fin bases, the second less than half the size of first; anal fin present; caudal fin asymmetrical, crescentic, with a strong lower lobe but no subterminal notch. Caudal peduncle depressed, with a strong keel on each side continuing forward onto the back and over the gill slits as a small ridge and flanked by 2 additional ridges above; upper precaudal pit present.

Colour: dark grey, reddish, or greenish grey above, with white or yellow spots and transverse stripes; white or yellowish below.



### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The combination of characters such as the truncated snout, the transverse mouth in front of eyes, the numerous small teeth, the lateral ridges, the precaudal keels and the colour pattern distinguishes the whale shark from all other sharks in the area.

### **SIZE:**

Maximum: to at least 12 m, and possibly to 21.4 m.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Widespread in the area, from South Africa, Mozambique, and Madagascar to the Red Sea, the "Gulf", Pakistan, India and Sri Lanka, also Seychelles and Mauritius. Elsewhere circumtropical in the eastern Indian Ocean, Pacific and Atlantic Oceans.

This huge pelagic filter feeder occurs singly or in schools, often at or near the surface, near shore or on the open sea. Oviparous, deposits huge eggs in large, football-sized cases; eggs hatch when the young are over 35 cm long.

Feeds on small pelagic crustaceans, schooling fishes including anchovies, sardines, and even albacores, and squids. Often seen in a vertical position with head at or near the surface when feeding. Usually harmless, and permitting close approach by divers; rarely ramming small boats, possibly when excited by fish hooked from the boats, but more often struck by ships while basking at the surface.

### **PRESENT FISHING GROUNDS:**

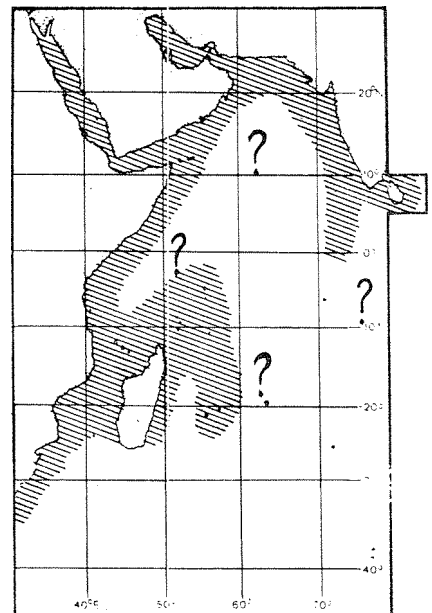
Off Pakistan and India.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Captured in floating gillnets and sometimes in trawls.

Utilized dried-salted for human consumption; liver processed for oil; offal probably also used for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

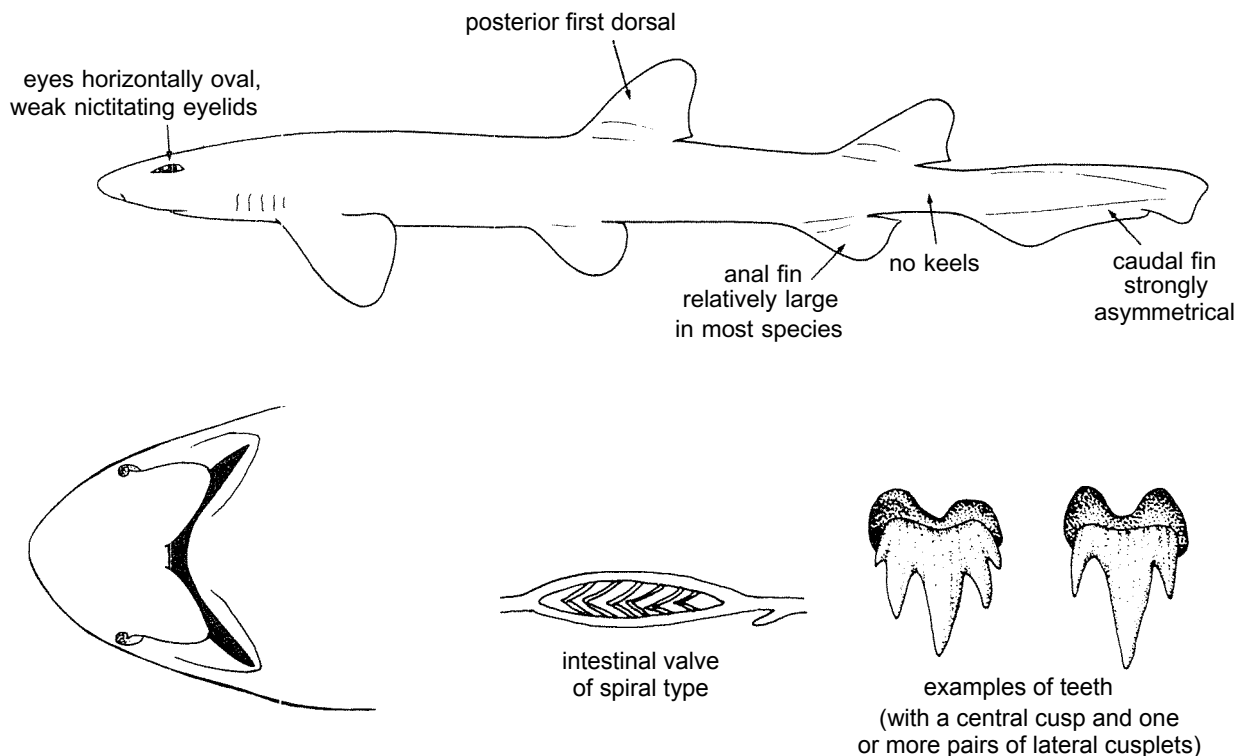
## SCYLORHINIDAE

## Catsharks

Small sharks with slender and elongated to moderately stout bodies. Head with 5 gill slits, the last two posterior to pectoral fin origins; gill arches with or without small papillose gillrakers; nostrils with or without barbels and lacking deep nasoral grooves or circumnarial grooves; eyes horizontally oval, elongated, with weakly differentiated nictitating lower eyelids delimited below by a variably developed subocular pouch; mouth moderately large, with rear corners behind front margins of eyes; labial furrows present in species from the area; teeth very small, numerous, with a single medial cusp and usually one or more cusplets on each side near the center of mouth, the rear teeth often comblike. Two dorsal fins, the first originating over or posterior to pelvic fin bases, the second dorsal smaller, as large, or larger than the first dorsal, but never greatly reduced; anal fin usually considerably longer than, and originating in advance of, second dorsal fin; caudal fin strongly asymmetrical, its lower lobe absent or only weakly indicated. upper edge unrippled, and subterminal notch present. Caudal peduncle not flattened dorso-ventrally, without lateral keels or precaudal pits. Intestine with a corkscrew or auger-like spiral valve, with 5 to 22 turns.

Colour: grey, brown, yellowish or black, often with light or dark spots and dark blotches, bars and saddles.

This family includes numerous small to moderate-sized species (rarely reaching to 1.5 m total length) from tropical and temperate latitudes ranging from shallow coastal waters to depths greater than 2 000 m. They are generally poor swimmers and do not migrate over great distances. Most species live on or near the bottom, feeding chiefly on invertebrates and small fishes. Some are rather common and regularly taken as bycatch in the trawl fisheries off South Africa and Mozambique. Scyliorhinids are common sports catches in South Africa but are not utilized to any extent. Elsewhere in the area they are little utilized as the species present are small and mostly occur in deep water. Separate statistics are not reported for this family.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

The catsharks are easily distinguished from superficially similar families by the combination of characters such as their small size, the location of the last two gill slits behind the pectoral fin origins, the posterior position of the first dorsal fin, the comparatively large anal fin, the strongly asymmetrical caudal fin, the absence of keels or precaudal pits on the caudal peduncle and the presence of a spiral intestinal valve.

**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

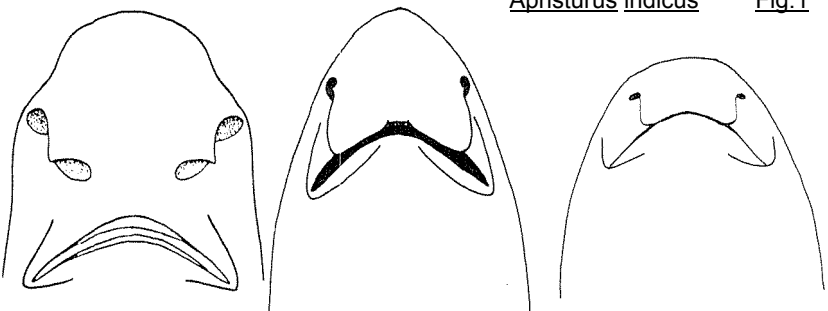
- 1a. Snout elongated, snout equal to or greater than mouth width (Fig.2a). base of anal fin ending close to lower caudal fin origin (Fig.1) ..... Apristurus indicus



Apristurus indicus Fig.1

- 1b. Snout shorter, less than mouth width; base of anal fin separated from lower caudal fin origin by a considerable space

- 2a. Anterior nasal flaps greatly expanded posteromedially, overlapping mouth and nearly meeting medially; shallow nasoral grooves present between nostrils and mouth; labial furrows very long, uppers reaching level of mouth



a) Apristurus indicus

b) Atelomycteris marmoratus

c) Haploblepharus fuscus

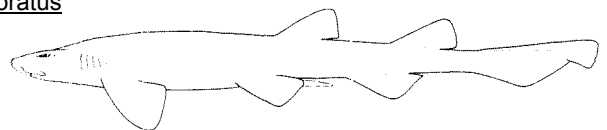
underside of head

Fig.2

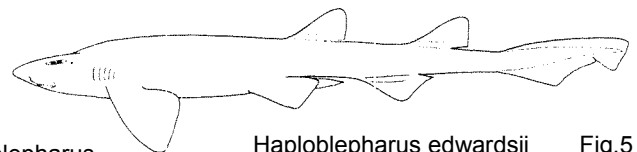
- 3a. Head narrow, snout narrowly rounded (Fig. 2b); gill openings lateral, not well above pectoral fin bases; supra-orbital crests present on cranium; colour pattern bold black and white spotting, not forming saddles (Fig.3) .... Atelomycteris marmoratus

Atelomycteris marmoratus Fig.3

- 3b. Head broad, snout broadly rounded (Fig. 2c); gill openings dorso-lateral, well above pectoral bases; supra-orbital crests absent from cranium; colour pattern of saddles and small light spots on a brown background, or plain golden brown (Figs 4,5)..... Haploblepharus



Haploblepharus fuscus Fig.4

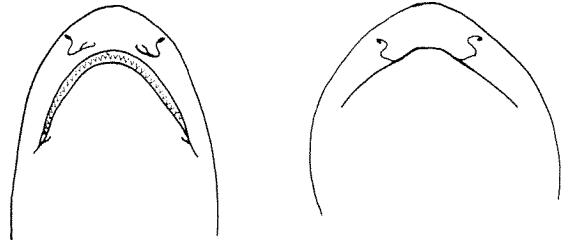


Haploblepharus edwardsii Fig.5



- 4a. Dorsal surface plain golden brown, without saddles or white spots (Fig.4) .....Haploblepharus fuscus
- 4b. Dorsal surface with dark brown saddles and numerous white spots on a pale to reddish brown background (Fig.5) ..... Haploblepharus edwardsii

2b. Anterior nasal flaps not expanded posterior-medially, may reach mouth but do not meet medially; no nasoral grooves; labial furrows absent or short to moderately long; upper furrows, when present, not reaching mouth level (Figs 6,9,14)



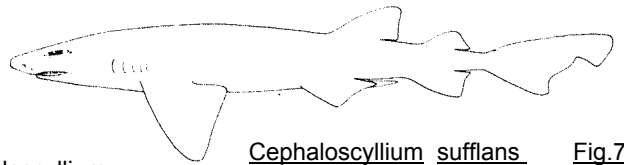
a) Cephaloscyllium sufflans                      b) Cephaloscyllium silasi

underside of head

Fig.6

6a. Labial furrows absent or vestigial (Fig. 6); second dorsal fin base entirely above anal fin base (Figs 7,8)..... Cephaloscyllium

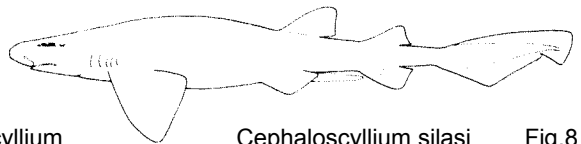
7a. Colour pattern of indistinct dusky saddles present or not; snout rounded; anterior nasal flaps not reaching mouth (Fig.6a); size large, adults exceeding 100 cm (Fig.3)..... Cephaloscyllium sufflans



Cephaloscyllium sufflans                      Fig.7

sufflans

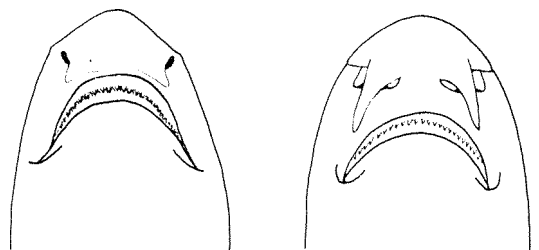
7b. Colour pattern of prominent dark bars and saddles; snout wedge-shaped; anterior nasal flap, reaching mouth (Fig.6b); size small, adults probably not exceeding 40 cm (Fig.8).... Cephaloscyllium silasi



Cephaloscyllium silasi                      Fig.8

silasi

6b. Labial furrows present on lower jaw or on both jaws (Fig.9); second dorsal fin base partly posterior to anal base (Figs 10,11)

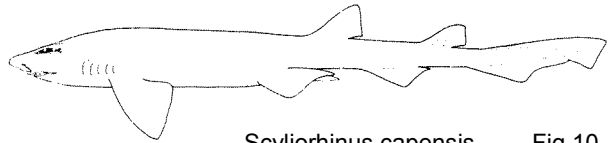


a) Scyliorhinus capensis                      b) Poroderma marleyi

underside of head

Fig.9

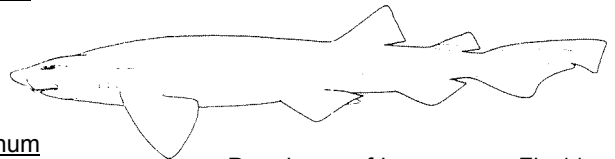
8a. Anterior nasal flaps not notched, without barbels; labial furrows on lower jaw only (Fig.9a); colour pattern of white spots on dark background (Fig. 10)..... Scyliorhinus capensis



Scyliorhinus capensis Fig.10

8b. Anterior nasal flaps deeply notched, with centre ridge expanded as prominent barbels; labial furrows present on both jaws, upper furrows short (Fig. 9b); colour pattern consisting of rows of dark spots or rosettes of spots or horizontal lines on light background (Figs 11-13) ..... Poroderma

9a. Colour pattern of horizontal dark stripes (Fig.11); nasal barbels shorter, usually not reaching mouth (Fig.9b) ..... Poroderma africanum



Poroderma africanum Fig.11

9b. Colour pattern of spots; nasal barbels longer, reaching mouth (Figs 12,13)

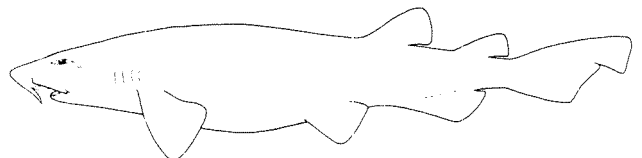
10a. Colour pattern consisting of large black spots (Fig.12) ..... Poroderma marleyi



Poroderma marleyi Fig.12

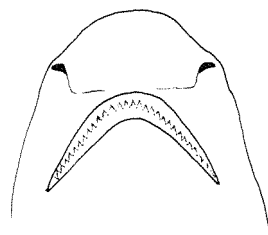
10b. Colour pattern consisting of rosettes of small spots or lines and spots (Fig.13) ..... Poroderma pantherinum

5b. Second dorsal fin nearly as large, as large, or larger than first dorsal (Figs 15-22); no supra-orbital crests on cranium

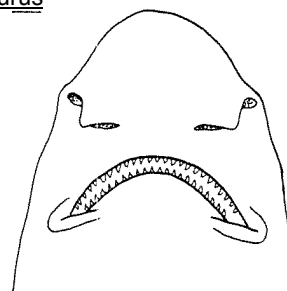


Poroderma pantherinum Fig.13

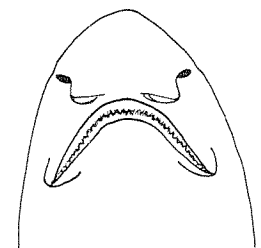
11a. Labial furrows absent; head very broad (Fig. 14a); small black dots on underside of head and abdomen (Figs 15,16) ..... Holohalaelurus



a) Holohalaelurus regani



b) Halaelurus lutarius



c) Halaelurus natalensis

Fig.14

12a. Anal fin base 3.5 times the fin height or less; denticles on dorsal surface of head and on back uniform in size; colour pattern of small dark spots on light background, background not forming a reticulated network (Fig.15) ..... Holohalaelurus punctatus



Holohalaelurus punctatus Fig.15

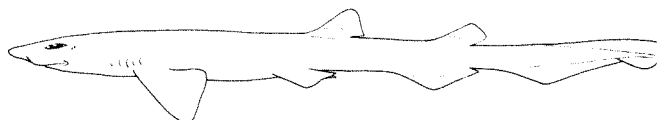
12b. Anal fin base more than 3.5 times the fin height; dorsal surface of head and back with scattered large pointed denticles among smaller flat denticles, giving surface a very rough texture; colour pattern of typically large dark spots and rings on light background, crowded together and providing effect of reticulated light network (Fig.16) .... Holohalaelurus regani



Holohalaelurus regani Fig.16

11b. Labial furrows present; head relatively narrow (Fig.14b); no black dots on undersurface (Figs 17-22) ..... Halaelurus

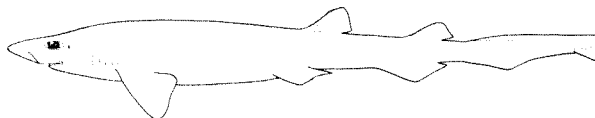
13a. No colour pattern, or at most indistinct dark crossbars, or saddles and white spots; gill openings not elevated above pectoral fin bases, lateral in position (Figs 17,18)\*



Halaelurus hispidus Fig.17

14a. Second dorsal fin usually larger than first; colour blackish ..... Halaelurus alcocki\*\*

14b. Second dorsal fin usually slightly smaller than first (Figs 17,18); colour grey-brown



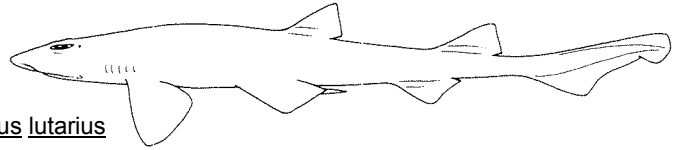
Halaelurus lutarius Fig.18

\* Character not known for H. alcocki. Generic placement of this species is provisional

\*\* This species has never been illustrated

15a. Palate with small papillae; eyes larger, their length in adults 14 times in distance from snout tip to first dorsal fin origin (Fig.17) ..... Halaelurus hispidus

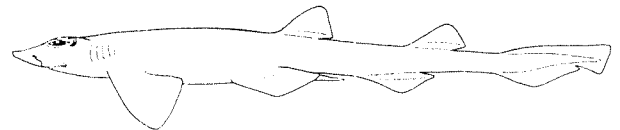
15b. Palate without papillae; eyes smaller, their length in adults over 14 times in distance from snout tip to first dorsal fin origin (Fig.18) ..... Halaelurus lutarius



Halaelurus boesemani Fig.19

13b. A distinct colour pattern of dark bars or saddles and spots on light background; gill openings elevated well above pectoral fin bases, dorsolateral in position (Figs 19-22)

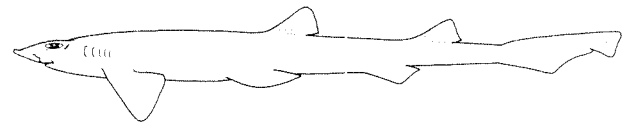
16a. Tip of snout bluntly rounded, without a terminal knob; colour pattern of broad obscure saddles and numerous dark spots (Fig.19) ..... Halaelurus boesemani



Halaelurus natalensis Fig.20

16b. Tip of snout pointed, with a small terminal knob; colour pattern of narrow vertical bars with or without spots (Figs.20-22)

17a. Colour pattern of pairs of dark bars forming saddles with enclosed light spaces; mouth relatively large (Fig.20) ..... Halaelurus natalensis



Halaelurus lineatus Fig.21

17b. Colour pattern of dark bars not forming saddles with enclosed light spaces; mouth relatively small (Figs 21,22)



Halaelurus quagga Fig.22

18a. Numerous small spots between crossbars and on head; snout tip upturned (Fig.21)...Halaelurus lineatus

18b. No spots or few spots between crossbars or on head; snout tip not upturned (Fig.22) .....Halaelurus quagga

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Apristurus indicus (Brauer, 1906)

Atelomycterus marmoratus (Bennett, 1830)

SCYL Atel 1

\* Cephaloscyllium silasi (Talwar, 1974)

\*\* Cephaloscyllium sufflans (Regan, 1921)

\*\*\* Halaelurus alcocki Garman, 1913

Halaelurus boesemani Springer & D'Aubrey, 1972

Halaelurus hispidus (Alcock, 1891)

Halaelurus lineatus Bass, D'Aubrey & Kistnasamy, 1975

Halaelurus lutarius Springer & D'Aubrey, 1972

Halaelurus natalensis (Regan, 1904)

Halaelurus quagga (Alcock, 1899)

Haploblepharus edwardsii (Voigt, in Cuvier, 1832)

Haploblepharus fuscus Smith, 1950

Holohalaelurus punctatus (Gilchrist, 1914)

Holohalaelurus regani (Gilchrist, 1922)

Poroderma africanum (Gmelin, 1789)

Poroderma marleyi Fowler, 1934

Poroderma pantherinum (Smith in Müller & Henle, 1838)

\*\*\*\* Scyliorhinus capensis (Smith in Müller & Henle, 1838)

Prepared by L.J.V. Compagno, Tiburon Center of Environmental Studies, San Francisco State University, Tiburon, California, U.S.A.

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\* Formerly placed in Halaelurus, but examination of types at Zoological Survey of India, Calcutta showed that this species clearly falls in Cephaloscyllium

\*\* Specimens referred to C. sufflans from Gulf of Oman possibly not identical with this species, known from Natal, South Africa, and southern Mozambique

\*\*\* A poorly known species, tentatively referred to the genus Halaelurus

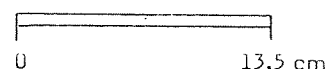
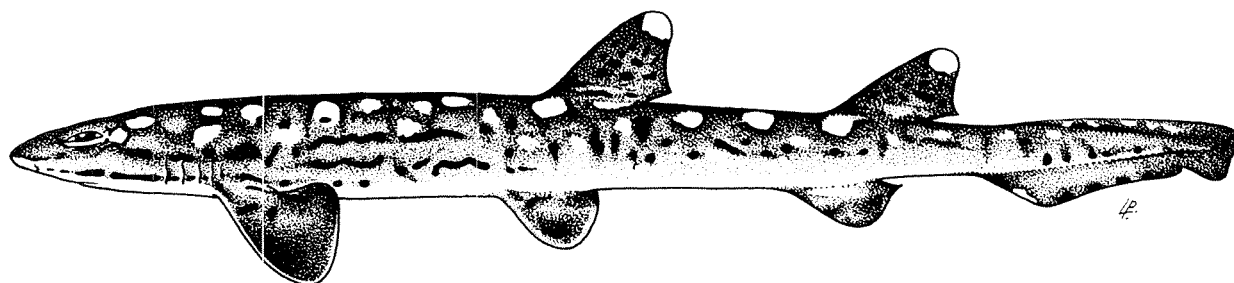
\*\*\*\* A record of this species from India may be referable to a different species, presumably undescribed

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SCYLIORHINIDAE

FISHING AREA 51  
(W. Indian Ocean)Atelomycterus marmoratus (Bennett, 1830)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO: En - Marbled catshark  
Fr - Chien corail  
Sp - Pintarroja coral

NATIONAL:

## DISTINCTIVE CHARACTERS:

A small shark. Body slender, head narrow; head with 5 pairs of small gill slits, the last 2 above the pectoral fin bases; nostrils without barbels, with greatly enlarged anterior nasal flaps, separated from each other by a very narrow space posteromedially and overlapping the mouth posteriorly; shallow nasoral grooves between nostrils and mouth but no perinasal grooves; mouth extending posteriorly behind front margins of eyes; labial furrows present on both jaws, very long and extending anteriorly to front of mouth; eyes horizontally elongated, in dorsolateral position, with weakly differentiated nictitating lower eyelids and shallow subocular pouches below them; snout short and narrowly rounded; teeth small and numerous, similar in both jaws and not bladelike, with a slender primary cusp and usually a cusplet on each side, not comblike at rear of mouth; anterior teeth of upper jaw smaller than lateral teeth and gradually increasing in size toward the sides, not separated from the laterals by minute intermediate teeth. First dorsal fin about as large as the second, originating over pelvic fin midbases; second dorsal fin originating over first third of anal fin base; anal fin smaller than second dorsal; caudal fin short, asymmetrical, with a subterminal notch but with no lower lobe, and its lower origin well separated from anal fin. Caudal peduncle without keels or precaudal pits. Supraorbital crests present on cranium.

Colour: grey above, white below, with numerous black bars and spots on back and sides, interspersed with large white spots to form a striking and conspicuous colour pattern; fins with dark spots and blotches, dorsals conspicuously white-tipped.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Haploblepharus species: the only other scyliorhinids in the area with expanded anterior nasal flaps and nasoral grooves, but differ from this species in their broader, more bluntly rounded snouts, dorsolateral gill slits, a different colour pattern with dark brown saddles and white spots or plain brown, without white-tipped dorsals, anal fin about as large as second dorsal, second dorsal over last half of anal fin base, and no supraorbital crests on the cranium.

The combination of characters including the bold colour pattern, small size and slender body, enlarged anterior nasal flaps and nasoral grooves, lack of barbels or perinasal grooves, first dorsal origin over the pelvic fin bases, equal-sized dorsal fins, long eyes with nictitating eyelids, mouth under the eyes, spiral valve, and short caudal fin without a lower lobe, separates this shark from all others in the area.

### SIZE:

Maximum: about 70 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, confined to the northeastern part, off Pakistan and India. Elsewhere, Malaya, Singapore, Indonesia, New Guinea, Thailand, Vietnam, Philippine Islands, South China, and Taiwan Island, but records from some parts of its range, including the present area, need to be confirmed by specimens. Western Australian records are apparently based on other species.

An inshore species, found on coral reefs. Oviparous.

Although common in parts of its range, the habits of this species are little known.

### PRESENT FISHING GROUNDS:

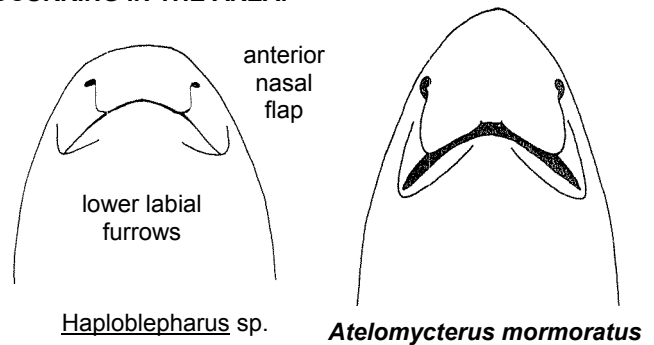
Off India and Pakistan.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

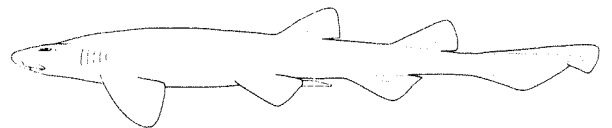
Separate statistics are not reported for this species.

Probably caught with line gear and gillnets, relatively unimportant.

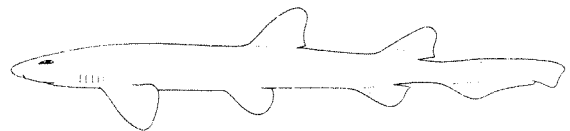
Utilized fresh and dried-salted or processed for fishmeal and oil.



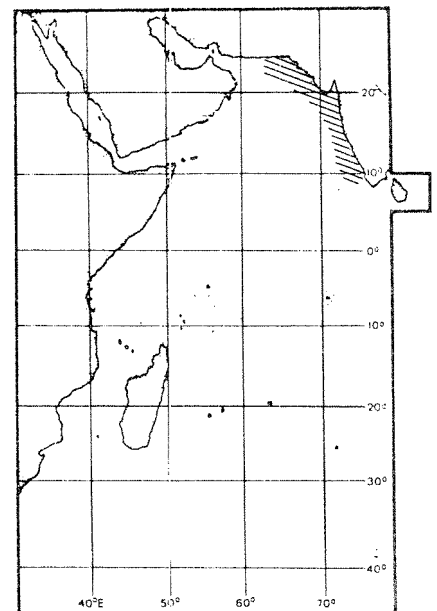
underside of head



Haploblepharus sp.



*Atelomycterus marmoratus*



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

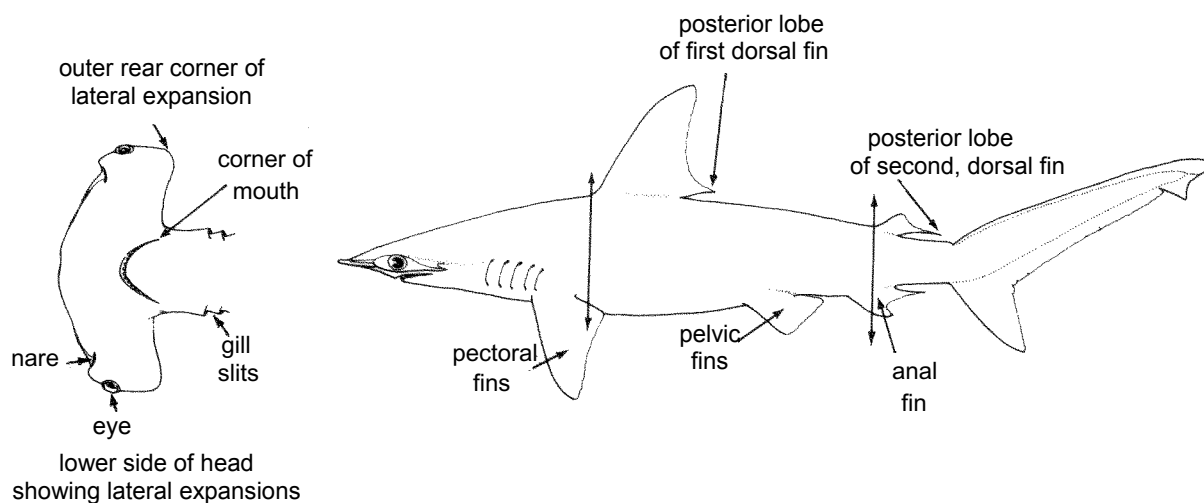
## SPHYRNIDAE

## Hammerhead and bonnethead sharks

Medium- to large-sized sharks. Body elongate and moderately slender, anterior portion of head much flattened dorso-ventrally and widely expanded laterally in "hammer" form, with the eyes at its outer edges. Well developed nictitating lower eyelids; teeth blade-like, with a single cusp. Two dorsal fins, the first high and pointed, its base much shorter than caudal fin and wholly anterior to origin of pelvics; caudal fin strongly asymmetrical, with a well marked subterminal notch and a small, but well defined lower lobe. Caudal peduncle not strongly flattened dorso-ventrally or widely expanded laterally, without longitudinal ridges but with precaudal pits.

Colour: back predominantly grey or brassy; belly white.

Hammerhead sharks inhabit surface waters in tropical and warm-temperate areas. Small species are confined to coastal waters; juveniles of large species are coastal, while adults are primarily semi-oceanic, although they often approach the coast in search of food. They are voracious predators, feeding mainly on fishes, sharks, rays and bottom-dwelling animals (some crustaceans and molluscs). A few species are reported dangerous to bathers. Hammerhead sharks are important for fisheries in the area and are used as food and also for the preparation of various subproducts, especially vitamin A from the liver.



## SIMILAR FAMILIES OCCURRING IN THE AREA:

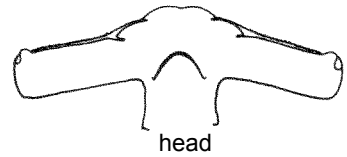
No other shark family has the characteristic hammer-shaped head of the Sphyrnidae.



**KEY TO GENERA AND SPECIES OCCURRING IN THE AREA:**

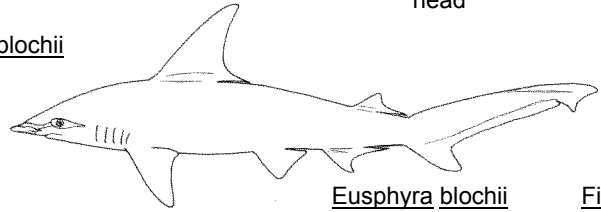
1a. Expanded lateral blades of head very narrow and winglike, with a series of small bumps along edges in front of nostrils: width across head 40 or 50% of total length; nostrils enormously expanded, each nearly twice the mouth width (Fig.1) .....

Eusphyra blochii



1b. Expanded lateral blades of head relatively broad, not winglike, and without small bumps along edges in front of nostrils: width across head less than 31% of total length; nostrils narrow, less than half the mouth width (Figs 2-4) .....

Sphyrna

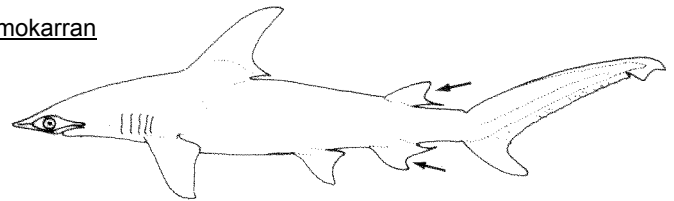
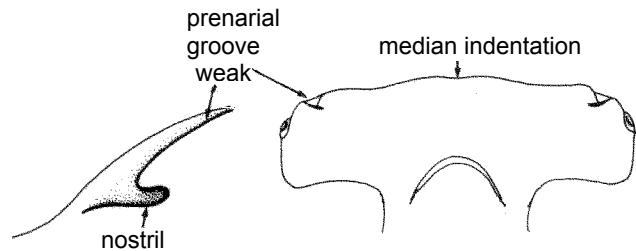


Eusphyra blochii

Fig.1

2a. Anterior margin of head nearly straight in adults, moderately convex in young; prenarial grooves hardly developed; teeth strongly serrated at all sizes; first dorsal fin markedly falcate; second dorsal about a third as high as first, with a short inner margin; posterior margins of second dorsal and pelvic fins deeply concave (Fig.2) .....

Sphyrna mokarran



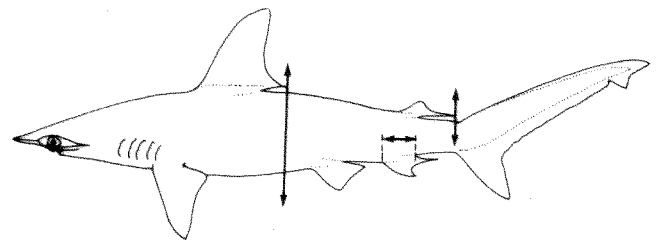
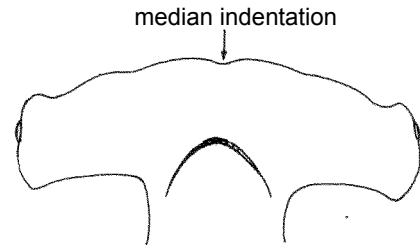
Sphyrna mokarran

Fig.2

2b. Anterior margin of head moderately convex in adults, strongly so in young, prenarial grooves well developed: teeth generally smooth, but possibly serrated in adults: first dorsal fin erect or slightly falcate; second dorsal less than a third the height of first, with a long inner margin; posterior margins of second dorsal and pelvic fins slightly concave to nearly straight (Figs 3,4)

3a. Median indentation present on anterior margin of head; free rear tip of second dorsal fin nearly reaching upper caudal fin origin: anal fin base noticeably larger than that of second dorsal (Fig-3) .....

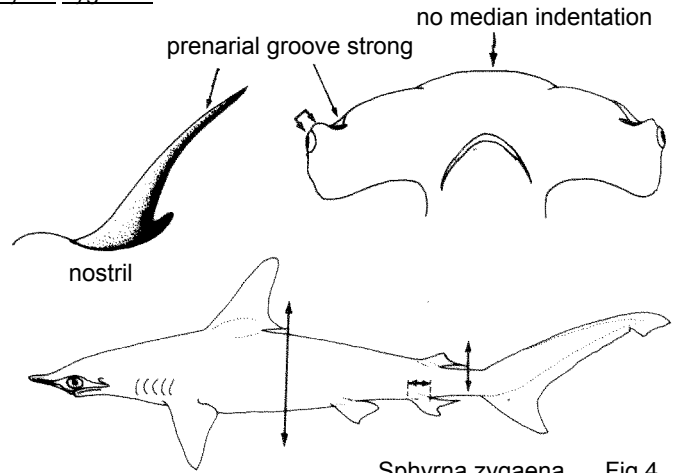
Sphyrna lewini



Sphyrna lewini

Fig.3

3b. Median indentation absent from anterior margin of head; free rear tip of second dorsal fin well head of upper caudal fin origin; anal fin base about as large as that of second dorsal (Fig.4) .... Sphyrna zygaena



**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which identification Sheets are included

Eusphyrna blochii (Cuvier, 1817)

SPHYRN Fus

Sphyrna lewini (Cuvier, Griffith & Smith, 1834)

SPHYRN Sphyrn 1

Sphyrna mokarran (Rüppell, 1837)

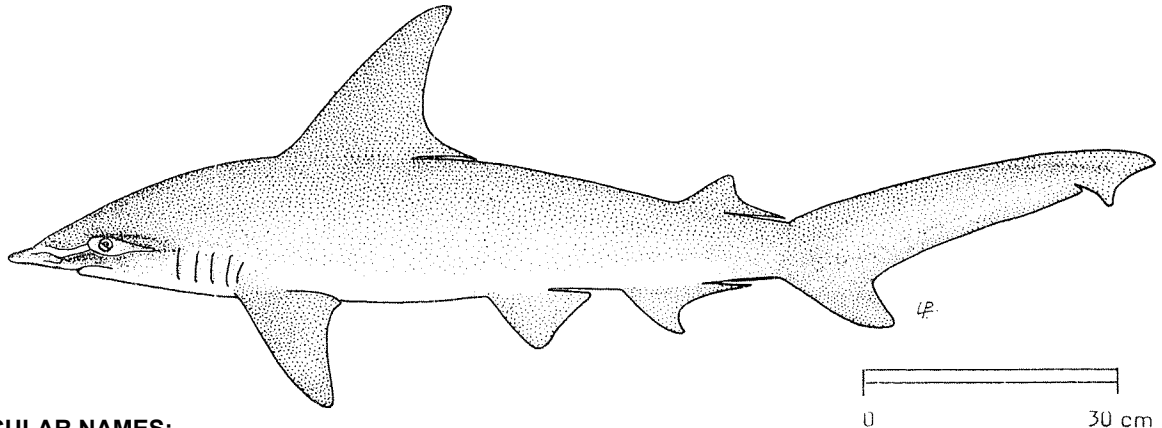
SPHYRN Sphyrn 3

Sphyrna zygaena (Linnaeus, 1758)

SPHYRN Sphyrn 4

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SPHYRNIDAE

FISHING AREA 51  
(W. Indian Ocean)Eusphyra blochii (Cuvier, 1817)OTHER SCIENTIFIC NAMES STILL IN USE: Sphyrna blochii (Cuvier, 1817)

## VERNACULAR NAMES:

FAO :           En - Wrigghead shark  
                  Fr - Requin marteau planeur  
                  Sp - Cornuda planeadora

NATIONAL:

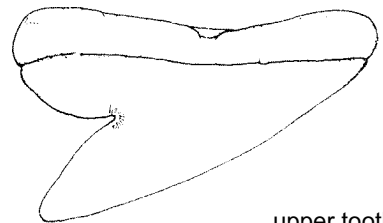
## DISTINCTIVE CHARACTERS:

Body elongate and compressed. Head shaped like a broad arrowhead or a pair of aircraft wings in dorsal or ventral view, tremendously expanded laterally and relatively narrow from front to back, with width across head 2/5 to 1/2 of total length; anterior contour of head almost V-shaped in young but with lateral wings of head becoming transverse in adults; a shallow, but distinct indentation at the midline of head and a very broad, shallow indentation opposite each nostril, the edge of which has a row of low bump; nostrils greatly elongated, wider than mouth, with strong prenarial grooves anteromedial to their incurrent apertures; posterior margins of eyes opposite or behind front of mouth; teeth triangular, deeply notched distally, with relatively narrow oblique cusps and unserrated edges. First dorsal fin very high, strongly falcate; second dorsal fin small and low, less than a third of height of first, with a greatly elongated inner margin nearly or quite twice the fin height, a free rear tip that nearly or quite reaches upper caudal fin origin, and a shallowly concave posterior margin; pelvics with posterior margin nearly straight; anal fin base about 1/3 longer than second dorsal fin base.

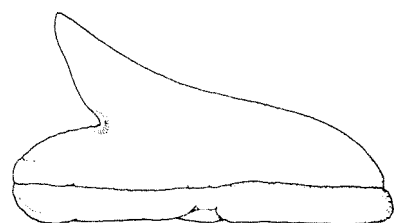
Colour: grey or grey-gown above, paler below.



underside of head



upper tooth



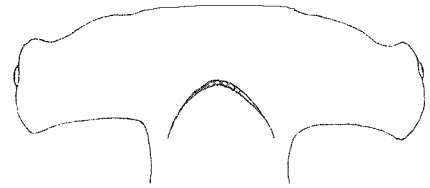
lower tooth

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Other species of Sphyrnidae: head hammer-shaped, less expanded laterally, width across head less than 1/3 of total length, no bumps along prenarial margin of head, nostrils much smaller, less than mouth width.

**SIZE :**

Maximum: about 152 cm.



underside of head

Sphyrna lewini

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

An Indo-West Pacific coastal species restricted in the area to the northeast, from the "Gulf" eastward to Pakistan, India and Sri Lanka. Elsewhere in the Eastern Indian Ocean/Western Central Pacific extending eastward to Thailand, Borneo, China, the Philippine Islands and Australia.

Inshore waters in the area. Viviparous, litters from 0 to 11 young; size at birth 32 to 45 cm.

A small species, probably harmless to people. Commonly taken in fisheries in the area.

**PRESENT FISHING GROUNDS:**

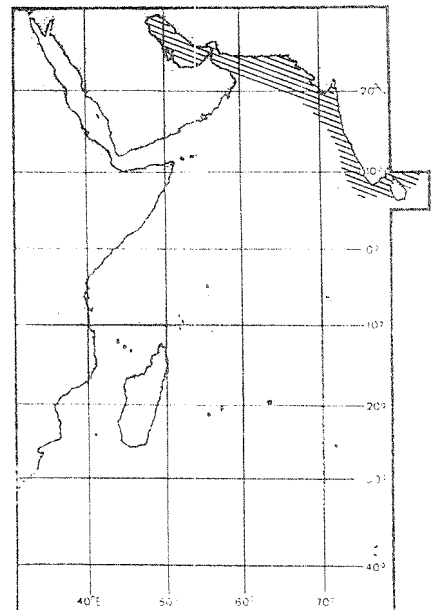
Both inshore and offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

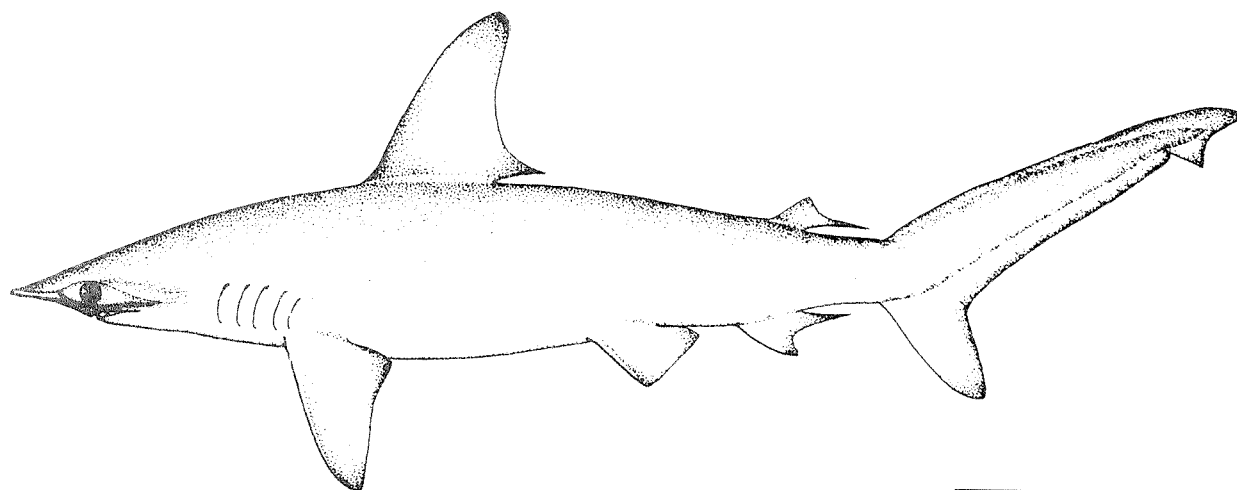
Caught with floating gillnets, probably fixed bottom gillnets, with floating longlines, and probably on hook and line.

Utilized fresh for human consumption; livers yield a high-potency vitamin oil; and offal is probably used for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SPHYRNIDAE

FISHING AREA 51  
(W. Indian Ocean)Sphyrna lewini (Cuvier, Griffith & Smith, 1834)OTHER SCIENTIFIC NAMES STILL IN USE : Sphyrna diplana Springer, 1941

0 60 cm

## VERNACULAR NAMES:

FAO : En - Scalloped hammerhead  
Fr - Requin marteau halicorne  
Sp - Cornuda común

NATIONAL :

## DISTINCTIVE CHARACTERS:

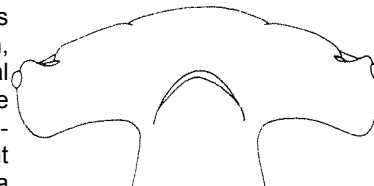
Body elongate and laterally compressed. Head "hammer"-shaped, its anterior contour broadly arched in young; but moderately so in adults, with a shallow but distinct indentation at the midline and a deep rounded depression opposite each nostril; lateral expansions of head very prominent, broad transversely and narrow from front, to back; nostrils with strong prenarial grooves anteromedial to their incurrent apertures; posterior margins of eyes slightly posterior to or nearly opposite front of mouth; mouth broadly arched; teeth triangular, deeply notched posteriorly, with smooth or finely serrated edges. First dorsal fin high, moderately falcate: second dorsal small, less than one fourth the height of first, with a greatly elongated free rear tip extending backward nearly to upper caudal fin origin, an inner margin about twice as long as the anterior fin margin and a shallowly concave posterior margin; pectoral fins short and broad; pelvics with a nearly straight posterior margin; second dorsal fin base about three to four fifths the length of anal base.

Colour: uniform grey, greyish brown or olivaceous above, shading to white below; pectoral fins tipped grey or black ventrally.

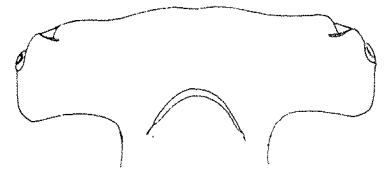
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Sphyrna zygaena: anterior contour of head not indented at midline; free rear tip of second dorsal fin shorter, not extending backward as near to precaudal pit as in S. lewini.

S. mokarran: anterior contour of head nearly straight in adults, prenarial grooves poorly developed, eyes well in front of mouth, teeth with strongly serrated edges; first dorsal fin more falcate; second dorsal about one third the height of first, with a strongly concave posterior edge, an inner margin about equal in length to anterior fin margin, and a free rear tip ending well anterior to upper caudal fin origin; pelvic fins with strongly concave posterior margins.

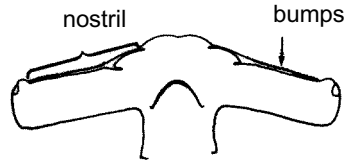


S. zygaena

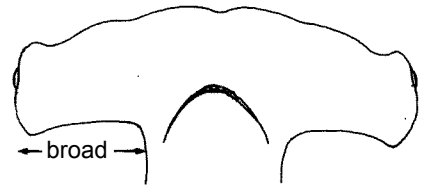


S. mokarran

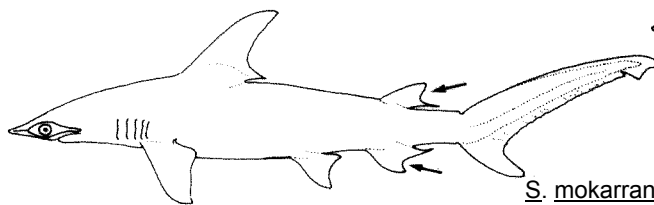
E. blochii: head extremely expanded, its width 2/5 to 1/2 of total length (less than 1/3 of total length in S. lewini), shaped like a broad arrowhead or a pair of aircraft wings in dorsoventral view, nostrils greatly expanded, their width much greater than mouth width (much less than mouth width in S. lewini), a row of bumps along front edge of head lateral to prenarial grooves.



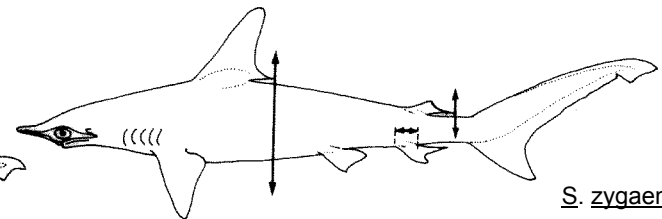
E. blochii



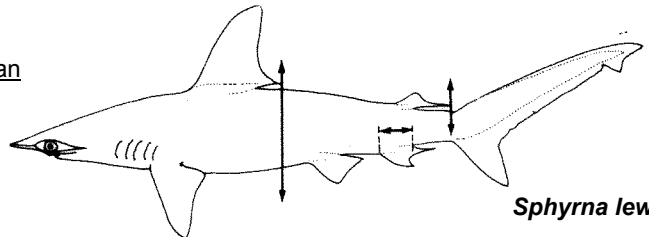
*Sphyrna lewini*



S. mokarran



S. zygaena



*Sphyrna lewini*

**SIZE:**

Maximum: 420 cm; common to 360

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

A pantropical species occurring in the area from South Africa and Madagascar northward to the Red Sea, Pakistan, India and Sri Lanka. Probably the commonest hammerhead in the area, and one of the more abundant species of sharks.

Estuarine and inshore to well offshore and semi-oceanic, with young mostly in coastal waters. Adults more often solitary or in pairs, while the young form huge schools. Viviparous, number of young up to 30; size at birth about 50 cm.

Feeds on pelagic fishes (including sardines, jacks, bluefish, tenpounders and mullets), other sharks and rays, squids, lobsters, shrimp and crabs. Adults considered potentially dangerous but often unaggressive when approached by divers.

**PRESENT FISHING GROUNDS :**

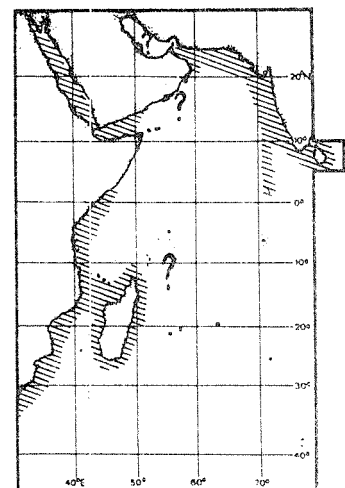
Both inshore and offshore in the area.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :**

Separate statistics are not reported for this species.

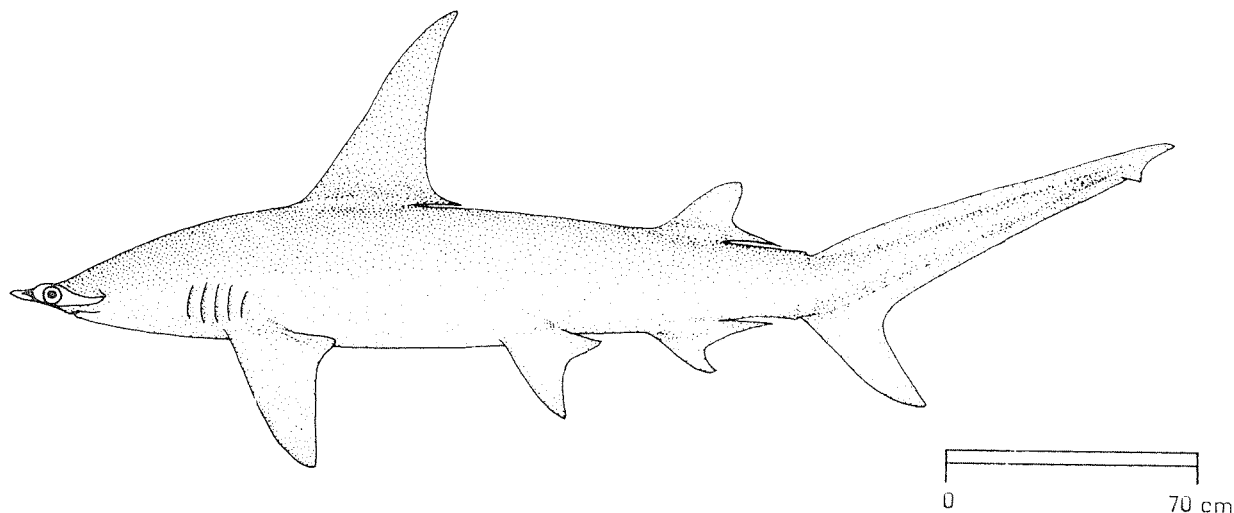
Caught with floating and bottom gillnets, floating longlines and probably on hook and line.

Utilized fresh and dried-salted for human consumption; fins used in the oriental sharkfin trade; livers processed for vitamins and offal for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SPHYRNIDAE

FISHING AREA 51  
(W. Indian Ocean)Sphyrna mokarran (Rüppell, 1837)OTHER SCIENTIFIC NAMES STILL IN USE : Sphyrna tudes (Valenciennes, 1822)

## VERNACULAR NAMES:

FAO : En - Great hammerhead  
Fr - Grand requin marteau  
Sp - Cornuda gigante

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body elongate and laterally compressed. Head "hammer" shaped, its anterior contour moderately arched in young but nearly straight in adults, with a shallow but distinct indentation at the midline and a shallow rounded depression opposite each nostril; lateral expansions of head very prominent, broad transversely and narrow from front to back; nostrils with weak prenarial grooves anteromedial to their incurrent apertures; posterior margins of eyes well anterior to mouth; mouth broadly arched; teeth triangular, deeply notched posteriorly, with strongly serrated edges. First dorsal fin very high, strongly falcate; second dorsal very large, with a rather short inner margin (about equal to anterior fin margin), a free rear tip ending well anterior to upper caudal fin origin, and a deeply concave posterior margin; pectoral fins short and broad; pelvics with a deeply concave posterior margin; anal fin base about as long as second dorsal base.

Colour: grey or grey-brown above, paler below; fins with dusky tips in young.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Sphyrna zygaena: no median indentation in frontal contour of head.

Other species of Sphyrmidae: anterior contour of head more convex, prenarial grooves deeper, teeth smooth-edged or finely serrated, first dorsal fin lower and less falcate, second dorsal smaller and with a less deeply concave posterior margin, pelvic fins with a nearly straight posterior margin, anal fin base usually longer than second dorsal base.

### SIZE:

Maximum: to 550 or 600 cm, and possibly more, but most adults between 240 and 365 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

A circumtropical species, wideranging in the area but current distributional records are spotty; from off South Africa, Madagascar, Mauritius and Seychelles Islands, the Red Sea, the "Gulf", probably off Pakistan, and the coasts of India and Sri Lanka. Elsewhere wide-ranging in the Eastern Indian Ocean/Western Central and Eastern Pacific, Atlantic and Mediterranean.

A powerful coastal and semi-oceanic species coming close inshore, often around and on coral reefs; also occurring near the surface in deep water not far from land. Viviparous, litters from 18 to 38 fetuses: size at birth between 60 and 70 cm.

Feeds on bony fishes (including sparids), other sharks, rays, squids, and lobsters. Potentially dangerous to people in the water.

### PRESENT FISHING GROUNDS:

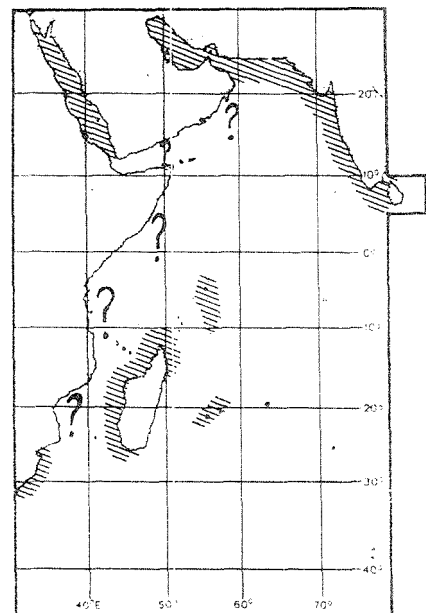
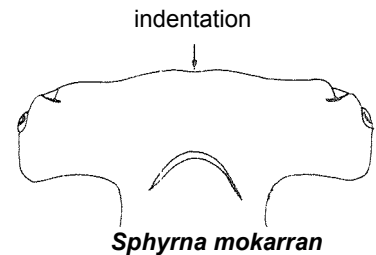
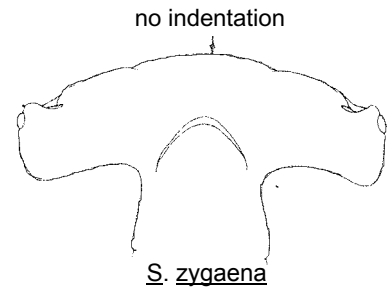
Both inshore and offshore.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with floating gillnets, bottom gillnets, floating longlines and probably on hook and line.

Utilized fresh and dried-salted for human consumption; oil processed for vitamins; fins used in the oriental sharkfin trade; and offal for fishmeal.



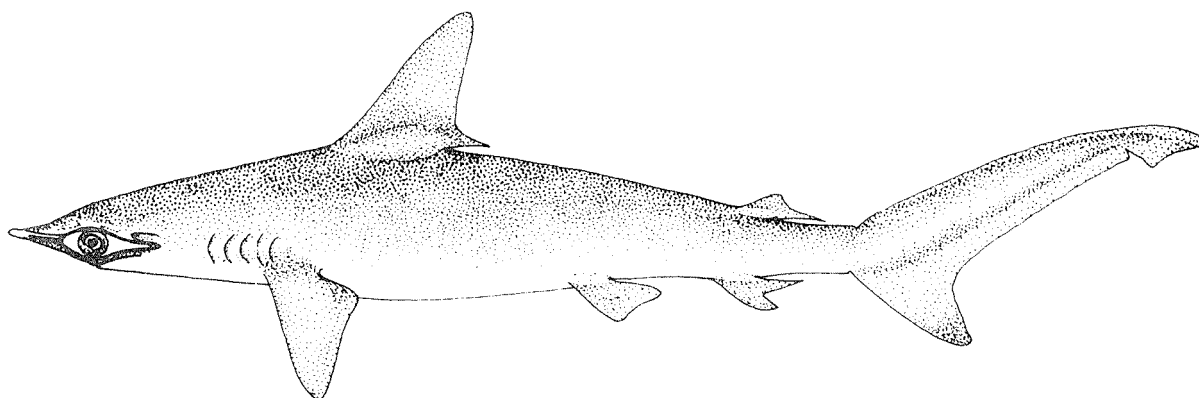


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : SPHYRNIDAE

FISHING AREA 51  
(W. Indian Ocean)*Sphyrna zygaena* (Linnaeus, 1758)

OTHER SCIENTIFIC NAMES STILL IN USE: None



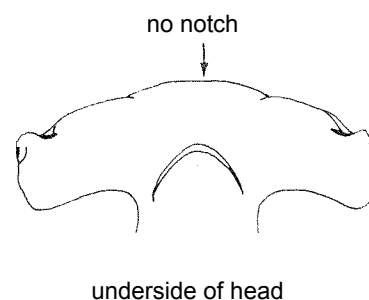
## VERNACULAR NAMES:

FAO : En - Smooth hammerhead  
Fr - Requin marteau commun  
Sp - Cornuda cruz (= Pez martillo)

NATIONAL :

## DISTINCTIVE CHARACTERS:

Body elongated and laterally compressed. Head "hammer" shaped, its anterior contour strongly arched in young but moderately rounded in adults, without a median indentation but with a deep rounded depression opposite each nostril; lateral expansions of head very prominent, broad transversely and narrow from front to back; nostrils with strong prenarial grooves anteromedial to their incurrent apertures; eyes large, their horizontal diameter greater than length of shortest (fifth) gill slit, their posterior margins about opposite mouth or just anterior to it; mouth broadly arched; teeth triangular, deeply notched posteriorly, with smooth or finely serrated edges. First dorsal fin high, moderately falcate; second dorsal small, with a very long inner margin (almost twice the anterior fin margin), a free rear tip ending well anterior to upper caudal fin origin, and a nearly straight to shallowly concave posterior margin; pectoral fins short and broad; pelvic fins with posterior margins straight to shallowly concave; anal fin base slightly longer than second dorsal fin base.



underside of head

Colour: brownish-olive, or plain grey above, white or grey-white below; fins nearly plain, dusky or blackish-tipped.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of Sphyrnidae: a median indentation in the anterior contour of head.

**SIZE:**

Maximum: probably between 370 to 400 cm, adults often between 275 to 335 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, distribution in some parts uncertain because of confusion of this species with *S. lewini*; definitely known from South Africa and Mozambique, possibly the "Gulf" and from southeastern India and Sri Lanka, but probably more widespread. Elsewhere in the Atlantic, Mediterranean, Western Central, and Eastern Pacific.

A common coastal and semioceanic species, living close inshore (especially the young) and near the surface in deep water riot far offshore. A strong-swimming shark, migrating northward in summer; young often found in large aggregations of hundreds of individuals. Viviparous, litters from 29 to 37 fetuses; size at birth about 50 or 60 cm.

Feeds on bony fishes, other sharks, rays, crustaceans and squids. Potentially dangerous to people.

**PRESENT FISHING GROUNDS:**

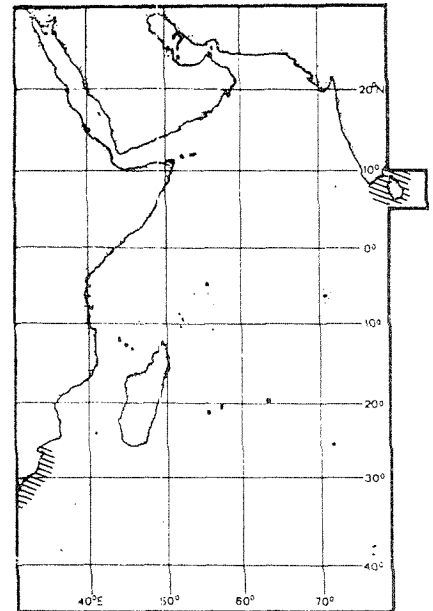
Off southeastern India and Sri Lanka, possibly also Mozambique.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with drifting gillnets, also floating longlines.

Utilized fresh and probably dried-salted for human consumption; oil for vitamin extraction; fins for the oriental sharkfin trade; and offal for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

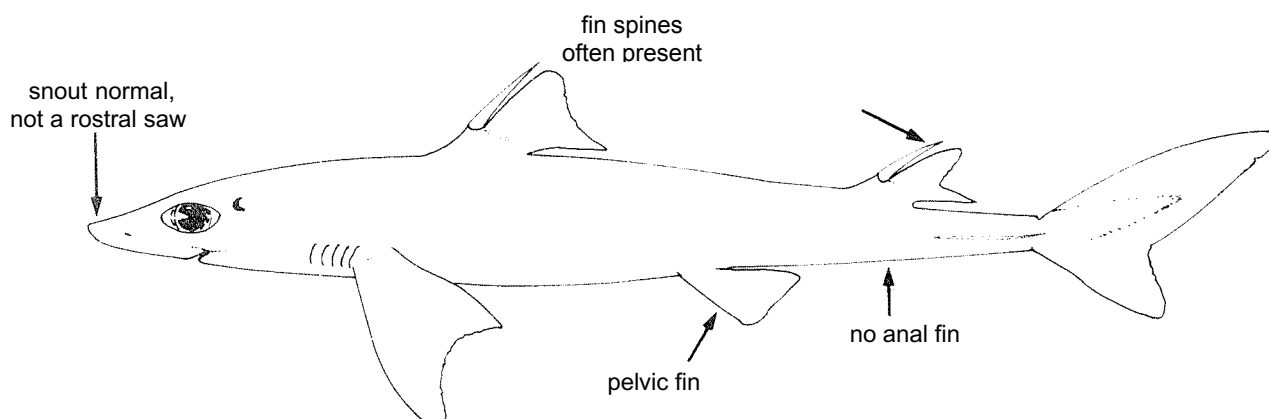
## SQUALIDAE

## Dogfish sharks

Small to moderately large sharks, with cylindrical or slightly compressed bodies, without ridges between pectoral and pelvic fins or with inconspicuous ridges (*Centroscymnus*, *Dalatias*, *Scymnodon*). Head with 5 gill slits, all anterior to pectoral fins, the fifth not abruptly longer than the others; spiracles always present, moderately large; eyes on sides of head, without nictitating eyelids. Snout short to moderately long, not formed as a rostral saw; no barbels on snout; teeth strong-cusped, alike or dissimilar in both jaws, with or without cusplets. Two dorsal fins with a long to vet short spine sometimes present (tip of latter may be concealed by skin), on their anterior margins; origin of first dorsal varying in position from a little (*Isistius*) in front of pelvic fin origins to over pectoral bases; pelvic fins equal to or smaller than second dorsal; no anal fin: caudal fin strongly asymmetrical to nearly symmetrical, with a lower lobe varying from virtually absent to very strong. Dermal denticles usually close-set, riot greatly enlarged and platelike.

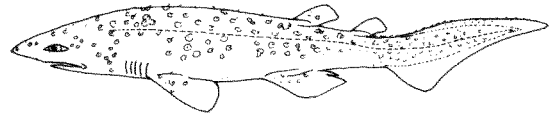
Colour: back greyish in shallow-water species, dark to black in those from deep water; several species have light organs (in the area, members of the genera *Etmopterus*, *Centroscyllium*, *Euprotornicrus*, *Squaliolus*, *Isistius* and *Heteroscymnoides*).

Dogfish sharks occurring in warm-temperate and tropical areas are mostly confined to deeper water (50 m and more); those occurring in cold-temperate water are usually shallow-water forms. Dogfish sharks often form schools; they feed mainly on fishes, and may cause damage to fishing gear when preying on the catch. One species in the area, the "cookie-cutter" shark (*Isistius brasiliensis*) is semiparasitic, attaching to large fishes, whales and dolphins with its suctional lips and gouging conical plugs of flesh out of its victims. Dogfish sharks are commonly caught by trawlers and by sports fishermen off South Africa and southern Mozambique but are apparently little utilized or primarily discarded. Utilization of squalids in other parts of Fishing Area 51 is poorly known, but probably at least some species are taken by commercial offshore trawlers in deep water and at least utilized for fishmeal. In the western Pacific, squalids support important deepwater line fisheries, for their squalene-rich livers, and they could do likewise in Fishing Area 51. The family has mainly potential importance as a fishery resource for food and liver oil.



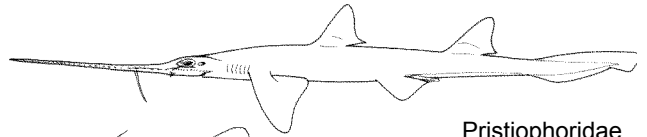
**SIMILAR FAMILIES OCCURRING IN THE AREA :**

**Echinorhinidae:** body set with sparse, large, plate-like denticles\*; spiracles small; fifth pair of gill slits abruptly longer than others; first dorsal fin origin over or posterior to pelvic fin origins; pelvic fins much larger than second dorsal fin.



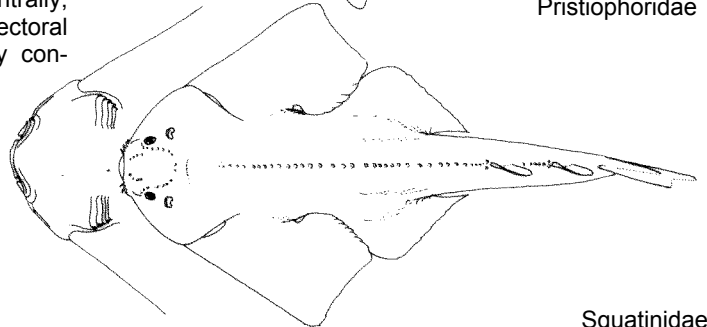
Echinorhinidae

**Pristiophoridae:** snout elongated into a flattened blade, with lateral teeth; barbels present in front of nostrils.



Pristiophoridae

**Squatinae:** trunk much flattened dorso-ventrally, eyes on upper side of head; anterior margins of pectoral fins extending forward past gill openings and partly concealing them; pelvic fins also very broad, wing-like.



Squatinae

All other shark families: anal fin present.

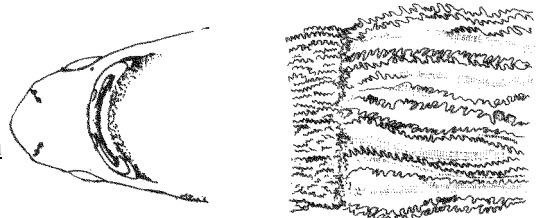
**KEY TO GENERA AND SPECIES OF SQUALIDAE CURRENTLY RECORDED FROM THE AREA:**

1a. Second dorsal fin, and usually first dorsal fin, without 3 spine

2a. Lips fringed (Fig.1b); edges of lower teeth serrated (Fig.2a) ..... Dalatias licha (Fig.1c)

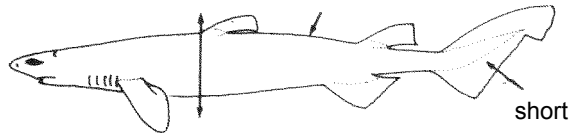
2b. Lips not fringed; edges of lower teeth smooth

3a. Cusps of lower teeth erect, distal edges not notched (Fig.2b); lips expanded and suctorial; rear end of first dorsal fin base about over pelvic fin origins (Fig.3) ..... Isistius brasiliensis



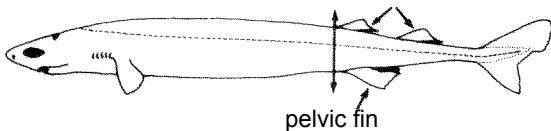
a) underside of head

b) fringed lips



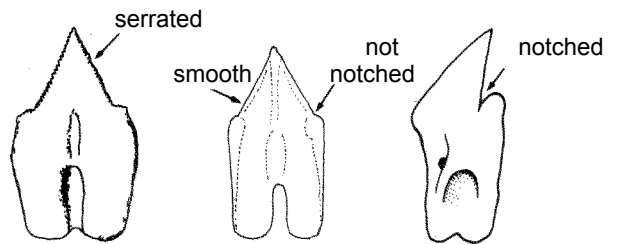
c) Dalatias licha

Fig.1



Isistius brasiliensis

Fig.3



a) Dalatias licha

b) Isistius brasiliensis

c) Euprotomiscus bispinatus

lower tooth

Fig.2

\*Character applying to species occurring in the area

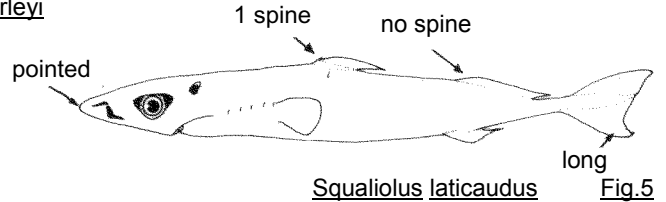
3b. Cusps of lower teeth oblique, distal edges notched (Fig.2c); lips not expanded and suctorial; rear end of first dorsal fin base well in front of pelvic fin origins (Figs 4-6)



Heteroscymnoides marleyi Fig.4

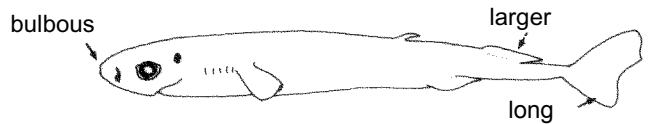
4a. First dorsal fin about as large as second; snout greatly elongated; caudal fin strongly asymmetrical, with a short lower lobe (Fig.4) .....Heteroscymnoides marleyi

4b. First dorsal fin shorter than second; snout short or moderately elongated; caudal fin nearly symmetrical, with a long ventral lobe (Figs 5,6)



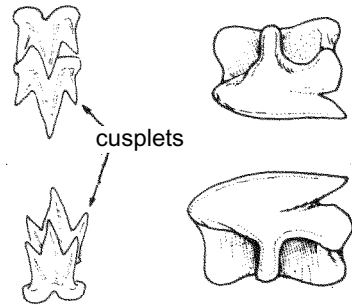
Squaliolus laticaudus Fig.5

5a. A spine on first dorsal fin, sometimes partly hidden by skin; fin length about half the length of second dorsal; fin base closer to pectoral fins than to pelvics; snout pointed (Fig.5) ..... Squaliolus laticaudus



Euprotomicrus bispinatus Fig.6

5b. No spine on first dorsal fin; fin length less than one third the length of second dorsal; fin base closer to pelvic fins than to pectorals; snout bulbously conical (Fig.6) ..... Euprotomicrus bispinatus



a) Centroscyllium ornatum

b) Squalus sp.

upper and lower tooth

Fig.7

1b. Spines present on both dorsal fins

6a. Teeth not bladelike in either jaw, with slender primary cusps and one or more cusplets (Fig.7a).. Centroscyllium ornatum (Fig.8)

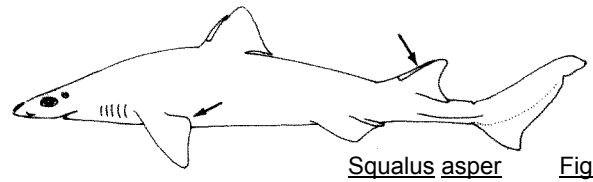
6b. Teeth bladelike in lower jaw or in both jaws, lower teeth without cusplets



Centroscyllium ornatum

Fig.8

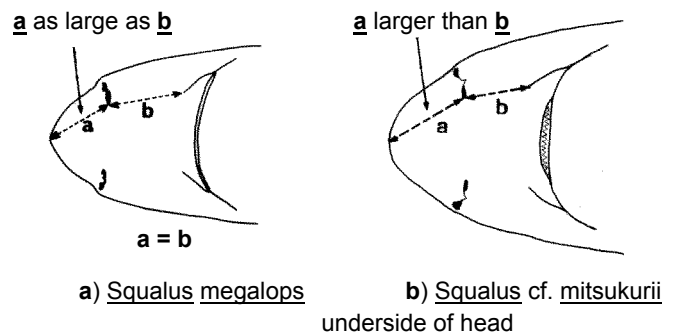
7a. Teeth nearly alike in both jaws, the lowers not greatly enlarged; both with strongly oblique, nearly horizontal cusps (Fig.7b); fin spines without grooves on sides; no subterminal notch on caudal fin; caudal peduncle with a strong keel and usually an upper precaudal pit (Figs 9, 11,12) .....Squalus



Squalus asper Fig.9

8a. First dorsal fin more posterior, origin of spine posterior to free rear tips of pectoral fins; second dorsal fin about as large as first; no precaudal pits (Fig.9).....Squalus asper

8b. First dorsal fin more anterior, origin of spine over middle of pectoral inner margins; second dorsal fin noticeably smaller than first; precaudal pit present at upper caudal fin origin (Figs 11,12)

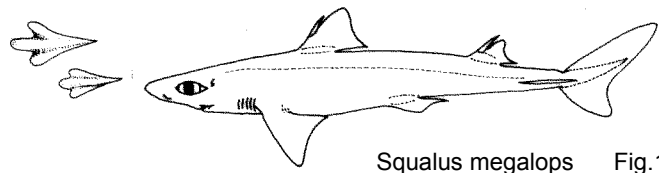


a) Squalus megalops b) Squalus cf. mitsukurii  
underside of head

Fig.10

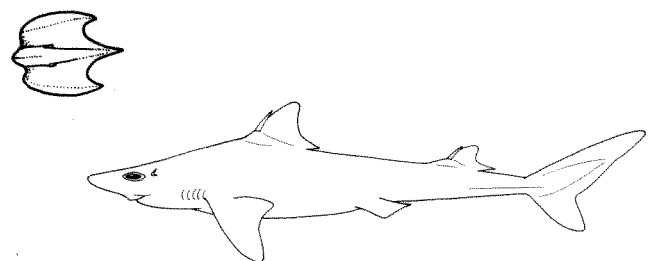
9a. Snout shorter distance from its tip to inner corner of nostril less than that from inner corner of nostril to upper labial furrow (Fig.10a); posterior margins of pectoral fins usually deeply concave, with rear tips acutely pointed; denticles from sides of body narrow and unicuspidate (Fig.11)..... Squalus megalops

9b. Snout longer, distance from its tip to inner corner of nostril greater than that from inner corner of nostril to upper labial furrow, posterior margins of pectoral fins weakly concave, their rear tips usually broadly rounded; denticles from sides of body broad and tricuspidate (Fig.12) ..... Squalus cf. mitsukurii



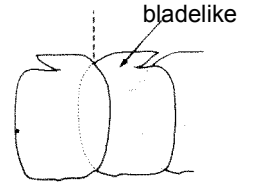
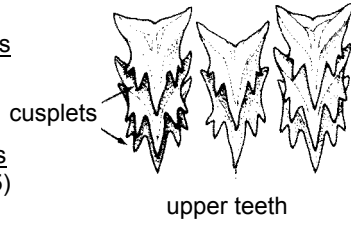
Squalus megalops Fig.11

7b. Teeth more or less unlike in both jaws, the lowers much larger than uppers, the latter with erect to oblique cusps; fin spines with grooves on sides; subterminal notch on caudal fin; caudal peduncle without keels or precaudal pits



Squalus cf. mitsukurii Fig.12

10a. Upper teeth with slender primary cusp and one or more cusplets on each side (Fig.13); second dorsal fin noticeably larger than first ..... Etmopterus



11a. Dermal denticles on sides of body truncated, without cusps (Fig.14a)..... Etmopterus pusillus (Fig.15)

11b. Dermal denticles on sides of body cuspidate (Fig.14b,c)

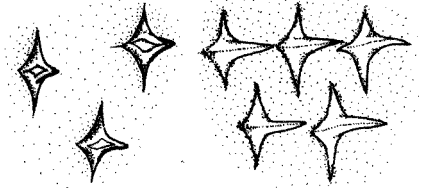
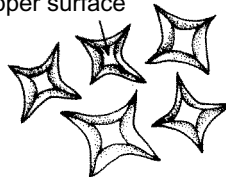
Etmopterus Fig.13

12a. Denticles arranged in regular rows on sides (Fig.14b) ..... Etmopterus lucifer (Fig.16)

12b. Denticles not arranged in regular rows on sides (Fig.14c) ..... Etmopterus sentosus (Fig. 17)

10b. Upper teeth with slender to thick primary cusps but with no cusplets; second dorsal fin as large or noticeably smaller than first

truncate upper surface



13a. Snout greatly elongated. its length greater than distance from centre of mouth to pectoral fin origins (Fig.18a); dermal denticles of back pitch-fork-shaped, crowns on tall, slender pedicels (Fig.18b) ..... Deania

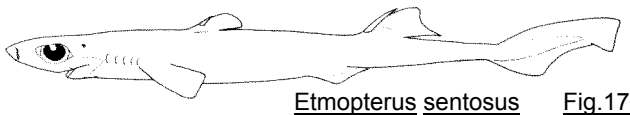
a) Etmopterus pusillus

b) Etmopterus lucifer

c) Etmopterus sentosus

dermal denticles

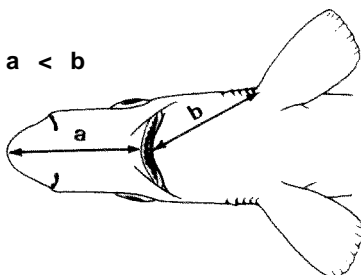
Fig.14



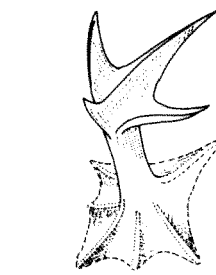
Etmopterus sentosus Fig.17



Etmopterus pusillus Fig.15

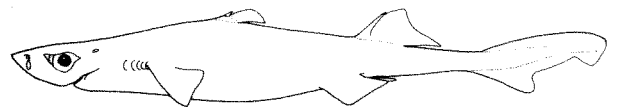


a) underside of head



b) dermal denticle

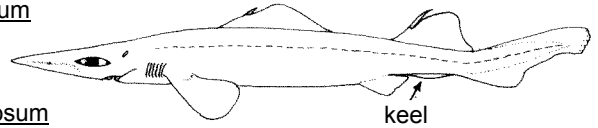
Fig.18



Etmopterus lucifer Fig.16

14a. A keel or flap on ventral surface of caudal peduncle (Fig.19) ..... Deania profundorum

14b. No keel or flap on ventral surface of caudal peduncle (Fig.20) ..... Deania quadrispinosum



Deania profundorum Fig.19

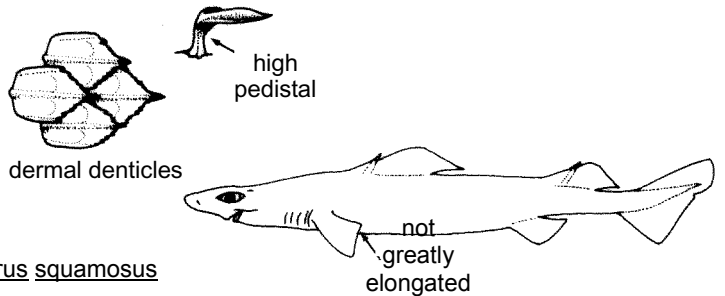
13b. Snout short to moderately elongated, its length equal or usually less than distance from centre of mouth to pectoral fin origins: dermal denticles with short pedicels and broad crowns, not pitch-fork-shaped



Deania quadrispinosum Fig.20

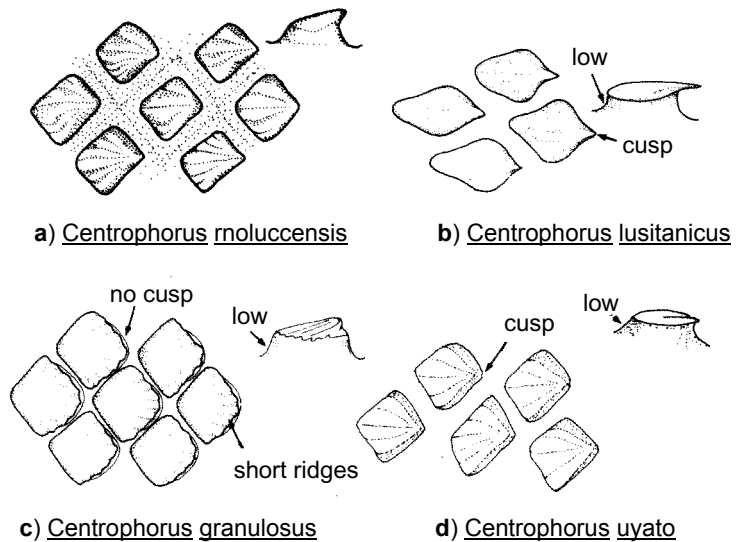
15a. Upper teeth relatively broad and low-cusped. the lowers low and wide; dorsal fin spines prominent and strong; origin of first dorsal fin spine over or just posterior to pectoral inner margins; inner corners of pectoral fins angular or greatly elongated ..... Centrophorus

16a. Dermal denticles on sides of body with leaf-shaped, overlapping crowns placed on low pedicels and armed with 3 or more cusps; inner corners of pectorals not greatly elongated (Fig.21) ..... Centrophorus squamosus



Centrophorus squamosus Fig.21

16b. Dermal denticles on sides of body with sessile crowns. thornlike in young, but with or without short crisps in adults, not overlapping (Fig.22): inner corners of pectorals greatly elongated



c) Centrophorus granulosus d) Centrophorus uyato

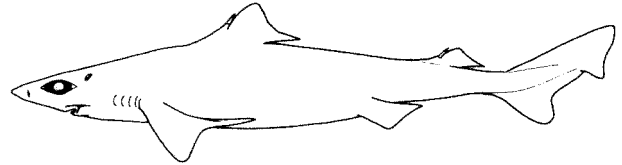
dermal denticles

Fig.22



17a. Second dorsal fin very small, much smaller than first dorsal, with the origin of its spine well posterior to pelvic free rear tips (Fig.23) .....Centrophorus moluccensis

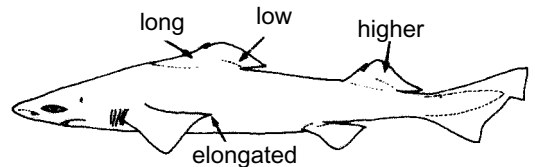
17b. Second dorsal fin large, nearly or quite as large as first, with spine origin over pelvic inner margins (Figs 24,26,27)



Centrophorus moluccensis Fig.23

18a. First dorsal fin long and low, second dorsal higher than first, but its base only half the length of first dorsal fin base (Fig.24).....Centrophorus lusitanicus

18b. First dorsal fin higher and shorter, second dorsal lower than first but its base about 2/3 to 3/4 of length of first (Figs 26,27)



Centrophorus lusitanicus Fig.24

19a. Teeth with erect cusps on upper jaw extending well lateral to symphysis (Fig. 253): denticles on sides of body without cusps in adults, broadly rounded, and with ridges confined to rear edges of crowns: oral cavity white; snout less pointed (Fig.26)..Centrophorus granulosus

19b. Teeth in upper jaw with oblique cusps except for a few rows with erect cusps close to symphysis (Fig.25b): denticles on sides of body with cusps and with ridges (running length of crown) in adults: oral cavity blackish: snout more pointed (Fig.27)..... Centrophorus uyato



a) Centrophorus granulosus

b) Centrophorus uyato

teeth Fig.25

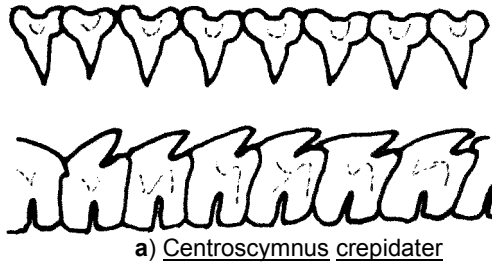


Centrophorus uyato Fig.27



Centrophorus granulosus Fig.26

15b. Upper teeth very narrow and high-cusped (except for lateral and posterior teeth of Centroscyrnus crepidater, but slender near the symphysis in this species also) (Fig.28); dorsal fin spines very small, the first dorsal spine well posterior to pectoral fin tips; inner corners of pectorals short and broadly rounded (Figs 30,31)



20a. Snout elongate, its length about equal to distance from centre of mouth to pectoral fin origins; cusps of more lateral upper teeth broad (Fig.28a); labial furrows long, lengths of uppers greater than distance between their anterior ends (Fig.29a), denticles on sides of body with incomplete medial and lateral ridges, not extending through entire length of crown in adults, and no transverse ridges (Fig.30) ..... Centroscyrnus crepidater

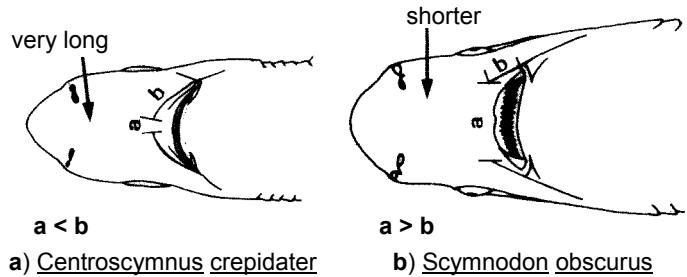
upper teeth



b) Scymnodon obscurus

Fig.28

20b. Snout shorter, its length less than distance from centre of mouth to pectoral fin origins; cusps of upper teeth slender (Fig.28b); labial furrows short, length of uppers less than distance between their anterior ends (Fig.29b); denticles on sides of body with complete medial and lateral ridges as well as transverse ridges in adults (Fig.31) .... Scymnodon obscurus



underside of head

Fig.29

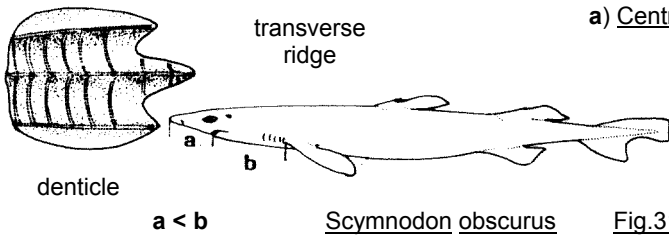


Fig.31

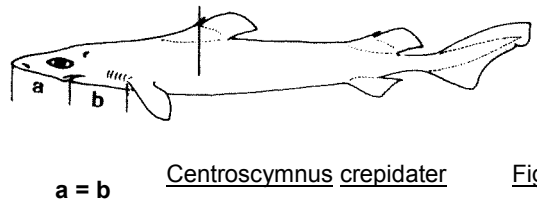


Fig.30

dermal denticle

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

* <u>Centrophorus granulosus</u> (Bloch & Schneider, 1801)	SQUAL Centrop 1
<u>Centrophorus lusitanicus</u> Bocage & Capello, 1864	SQUAL Centrop 2
** <u>Centrophorus moluccensis</u> Bleeker, 1856	SQUAL Centrop 5
<u>Centrophorus squamosus</u> (Bonnaterre, 1788)	SQUAL Centrop 3
<u>Centrophorus uyato</u> Rafinesque, 1809)	SQUAL Centrop 4
<u>Centroscyllium ornatura</u> (Alcock, 1889)	
*** <u>Centroscymnus crepidater</u> (Bocage & Capello, 1864)	SQUAL Centros 2
<u>Dalatias licha</u> (Bonnaterre, 1788)	SQUAL Dal 1
**** <u>Deania profundorum</u> (Smith & Radcliffe, 1912)	
<u>Deania quadrispinosum</u> (McCulloch, 1915)	SQUAL Dean 2
<u>Etmopterus lucifer</u> Jordan & Snyder, 1902	
<u>Etmopterus sentosus</u> Bass, D'Aubrey & Kistnasamy, 1976	
<u>Euprotomicrus bispinatus</u> (Quoy & Gaimard, 1824)	
<u>Heteroscymnoides marleyi</u> Fowler, 1934	
<u>Isistius brasiliensis</u> (Quoy & Gaimard, 1824)	
***** <u>Scymnodon obscurus</u> (Vaillant, 1888)?	
<u>Squaliolus laticaudus</u> Smith & Radcliffe, 1912	
<u>Squalus asper</u> Merrett, 1973	SQUAL Squal 5
<u>Squalus megalops</u> (Macleay, 1881)	SQUAL Squal 4
***** <u>Squalus mitsukurii</u> Jordan & Snyder, in Jordan & Fowler, 1903?	SQUAL Squal 6

Prepared by L.J.V. Compagno, Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, California, USA

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\*The genus Centrophorus is not well-known and is in need of a worldwide revision. It is not certain if the five species currently known from the area are the only ones that occur there. Care should be taken when examining Centrophorus specimens to make sure that other species are not being misidentified under the names of the known species

\*\*Including Atractophorus armatus Gilchrist, 1922 and Centrophorus scalpratus McCulloch, 1915

\*\*\*Including Centrophorus rossi Alcock, 1898 as a tentative synonym (holotype examined by writer); also, records of Centroscymnus owstoni Garman, 1906 from Western Indian Ocean are referable to this species, according to P.C. Heemstra (personal communication)

\*\*\*\* A third species of Deania, D. calcea (Lowe, 1839), is known from just south of the area, off the Cape coast of South Africa

\*\*\*\*\*Identification of this species provisional

\*\*\*\*\*This species is usually referred to Squalus blainvillei (Risso, 1826) but is closer to the Western Pacific S. mitsukurii and may be identical. So far, accounts of Squalus species of the S. blainvillei group from the area are of S. mitsukurii-like forms, but the true S. blainvillei, with much longer fin spines and higher first dorsal fin, may also eventually be found in the area. It is present in the Eastern Atlantic, apparently along with a S. mitsukurii-like species

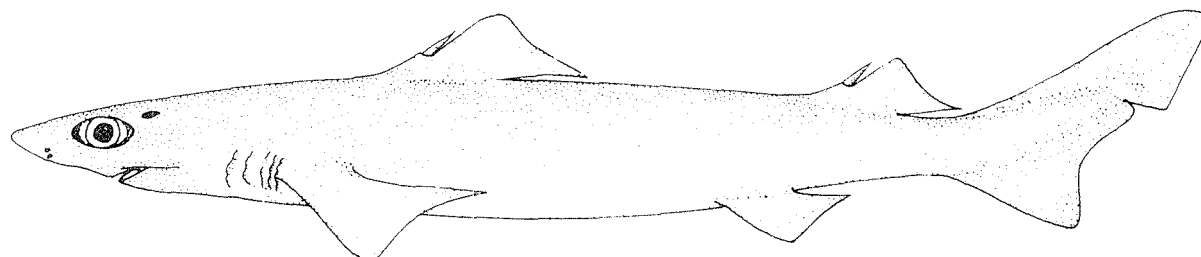
FAO SPECIES IDENTIFICATION SHEETS

FAMILY : SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)

Centrophorus granulosus (Bloch & Schneider, 1801)

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

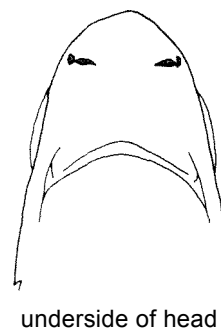
FAO: En - Gulper shark  
Fr - Squale-chagrin commun  
Sp - Quelvacho



NATIONAL:

DISTINCTIVE CHARACTERS:

Body elongate and slightly compressed; dermal denticles of back widely separated and not overlapping, low crowned, thornlike in young but broad and rounded in adults, without cusps and with low ridges confined to their posterior edges. Snout pointed and longer than mouth width but shorter than distance from mouth to pectoral fin origins. Teeth differing in upper and lower jaws; uppers much smaller, relatively broad and bladelike, with high, mostly erect cusps and no cusplets; lowers large, compressed, bladelike, with a single oblique cusp, no cusplets, a deeply notched outer edge, and serrations in adults. A short, strong spine with lateral grooves on anterior edges of both dorsal fins; first dorsal relatively high and short, second dorsal lower than first, its base about 3/4 the length of first dorsal base; inner corners of pectoral fins greatly elongated, produced as narrow, pointed lobes that extend to behind the level of first dorsal spine, and with inner margins longer than distance from second dorsal spine to caudal origin; caudal fin with a strong subterminal notch. Caudal peduncle without dermal keels or precaudal pits.

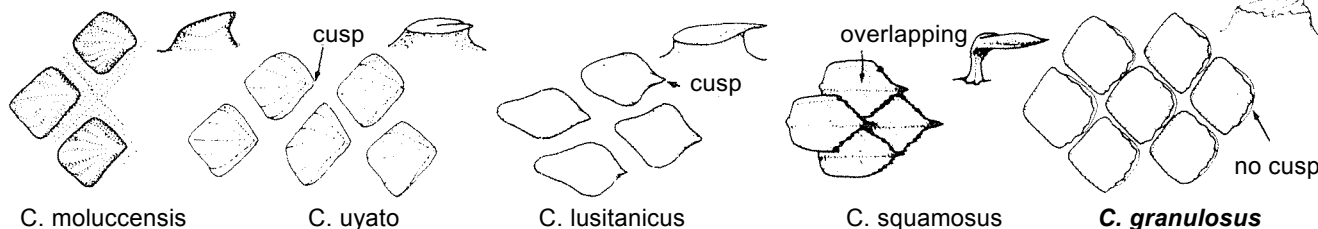


underside of head

Colour: grey above, lighter below.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Centrophorus uyato: dermal denticles of back with one cusp and ridges running the entire length of the crown in adults; upper teeth with mostly oblique cusps, except for a few rows at the symphysis; pectoral inner margins about as long as distance from second dorsal spine to caudal origin.



C. moluccensis

C. uyato

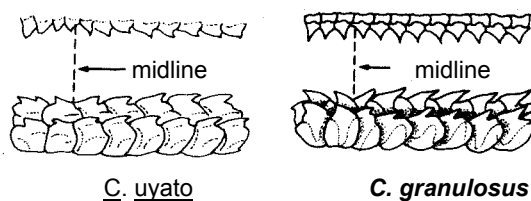
C. lusitanicus

C. squamosus

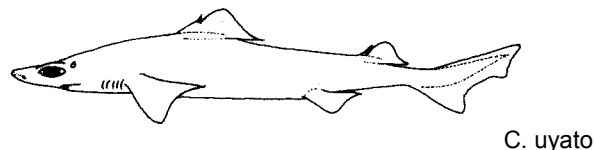
**C. granulosus**

dermal denticles

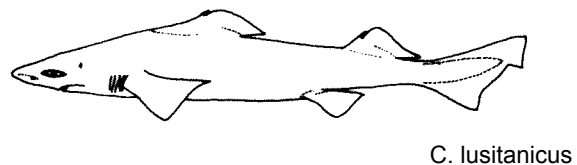
**Centrophorus lusitanicus:** dermal denticles of back with a cusp and ridges running the entire length of crown in adults; snout somewhat shorter, about equal to or shorter than mouth length; upper teeth with oblique cusps; first dorsal fin relatively low and long, second dorsal higher than first but its base only 1/2 the length of first dorsal base; pectoral inner margins slightly shorter than, or about equal to distance from second dorsal spine to caudal origin.



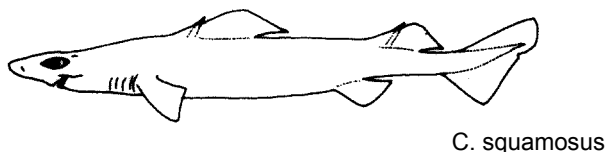
**Centrophorus squamosus:** dermal denticles of back with stalked, leaflike crowns overlapping each other, with a strong main cusp and 3 or more side cusps on their posterior edges, and ridges running the length of crown; first dorsal fin relatively low and long, second dorsal higher than first; inner corners of pectoral fins hardly elongated, not reaching level of first dorsal spine, inner margins of pectoral fins shorter than distance from second dorsal spine to caudal origin.



**Centrophorus moluccensis:** dermal denticles of back with a cusp and ridges running the entire length of crown in adults; upper teeth with oblique cusps; second dorsal fin very small, half the height of first or less, with spine origin behind rear tips of pelvic fins.



No other species of Squalidae in the area combine bladelike upper and lower teeth, grooved spines, relatively short snouts, elongated pectoral free rear tips, no caudal keels or abdominal ridges, no precaudal pits, and a strong subterminal notch on the caudal fin.

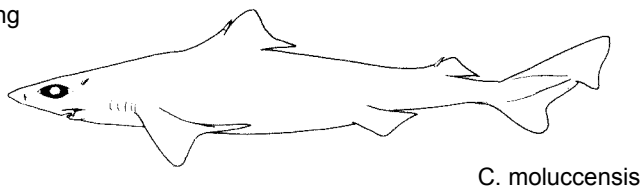


#### SIZE:

Adults to at least 150 cm.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, in the vicinity of Aldabra Island, but records need confirmation; possibly more wide-ranging. Elsewhere from the Western North Atlantic, Eastern Atlantic from Morocco to Zaire, and the Mediterranean Sea; possibly also Western Pacific.



A little known deepwater shark, relatively common in the Eastern Atlantic down to 1 200 m depth, near the bottom. Ovoviviparous, size at birth about 30 cm.

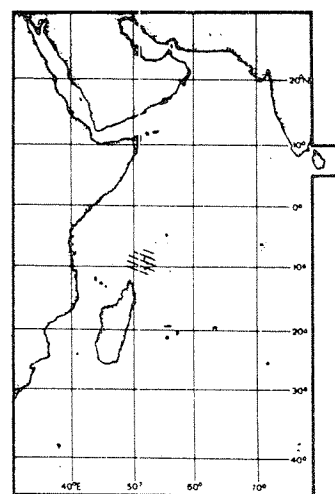
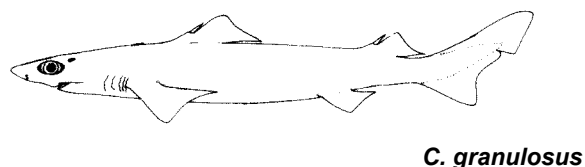
#### PRESENT FISHING GROUNDS:

Uncertain.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :

Separate statistics are not reported for this species.

Mode of utilization and fishing gear uncertain.

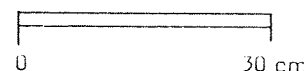
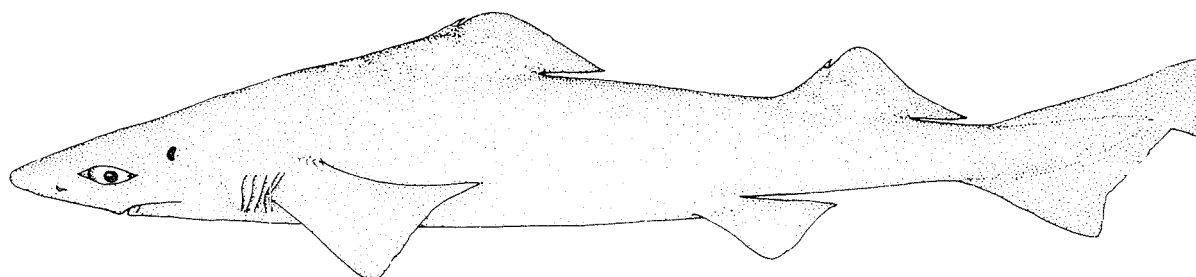


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Centrophorus lusitanicus Bocage & Capello, 1864

OTHER SCIENTIFIC NAMES STILL IN USE: None



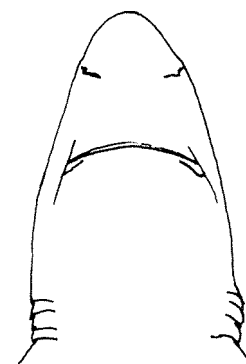
## VERNACULAR NAMES:

FAO :           En - Lowfin gulper shark  
                   Fr - Squale-chagrin à longue dorsale  
                   Sp - Quelvacho lusitánico

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body elongate and slightly compressed; dermal denticles of back widely separated and not overlapping, low-crowned, thornlike in young but broader in adults, with low ridges running the length of the crown and a very short cusp on their posterior edges. Snout: pointed and moderately long, about equal to, or shorter than, mouth length, and not as long as the distance from mouth to pectoral fin origins. Teeth differing in upper and lower jaws, uppers much smaller, relatively broad and bladelike, with low, oblique cusps and no cusplets; lowers large, compressed, bladelike, with a single oblique cusp, no cusplets, a deeply notched outer edge, and serrations in adults. A short, strong spine with lateral grooves on anterior edges of both dorsal fins; first dorsal relatively low and long, second dorsal higher than first, its base about 1/2 the length of first dorsal base; inner corners of pectoral fins greatly elongated, produced as narrow, pointed lobes reaching past the first dorsal spine, their inner margins about equal to or somewhat shorter than distance from second dorsal spine to upper caudal origin; caudal fin with a strong subterminal notch. Caudal peduncle without dermal keels or precaudal pits.

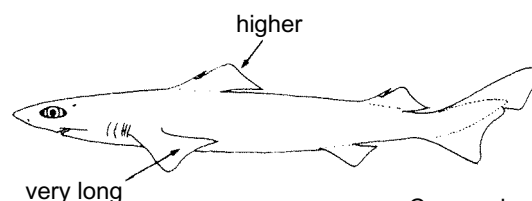


underside of head

Colour: dark grey-brown above, lighter below.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Centrophorus granulosus and C. uyato: first dorsal fin higher and shorter, second dorsal lower than first but its base about 3/4 the length of first dorsal base,.

C. granulosus

Centrophorus moluccensis: second dorsal fin much smaller than first, half its height, spine origin behind pelvic free rear tips; pectoral free rear tips more attenuated.

Centrophorus squamosus: dermal denticles of back with stalked, leaflike crowns overlapping each other; inner corners of pectoral fins hardly elongated and not reaching the level of first dorsal spine, inner margins of pectoral fins shorter than distance from second dorsal spine to caudal origin.

No other species of Squalidae in the area combine blade-like upper and lower teeth, grooved spines, relatively short snouts, elongated pectoral free rear tips, no caudal keels or abdominal ridges, no precaudal pits, and a strong subterminal notch on the caudal fin.

**SIZE:**

Adults to at least 160 cm, maturing between 110 and 145 cm, females considerably larger than males.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area known from South Africa and the Mozambique Channel, but probably more wide-ranging. Elsewhere in the Eastern Atlantic from Portugal to Nigeria, and the Western Pacific off Taiwan Island.

A little known deepwater shark living along the edge of the continental shelves and upper slopes at depths between 300 and 1000 m. Ovoviviparous, number of fetuses in a litter 1 to 7; size at birth between 30 and 40 cm.

Feeds on bony fishes, other squalids, squids and crustaceans.

**PRESENT FISHING GROUNDS:**

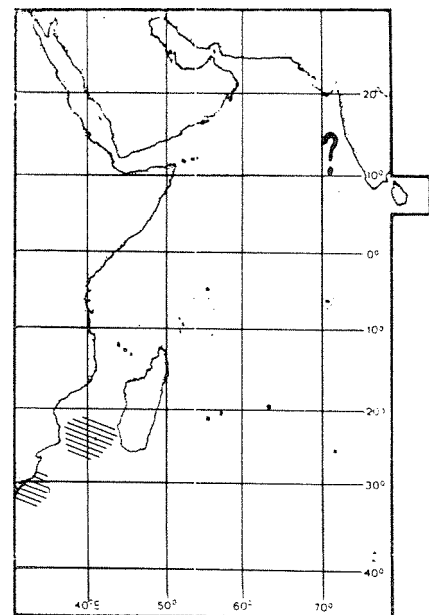
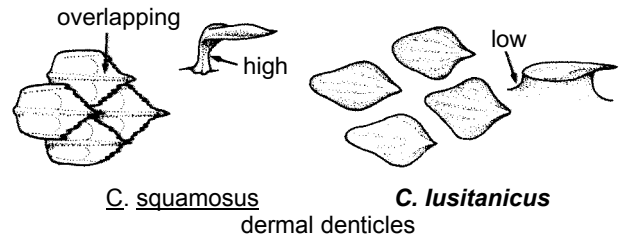
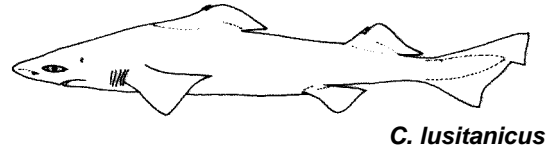
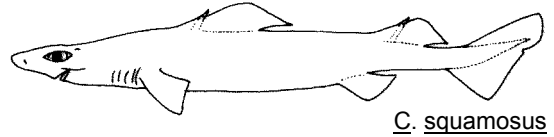
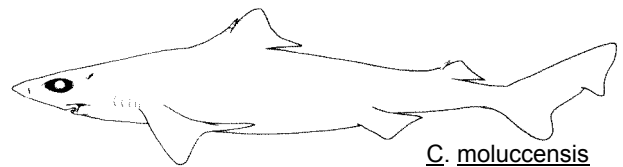
Offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :**

Separate statistics are not reported for this species.

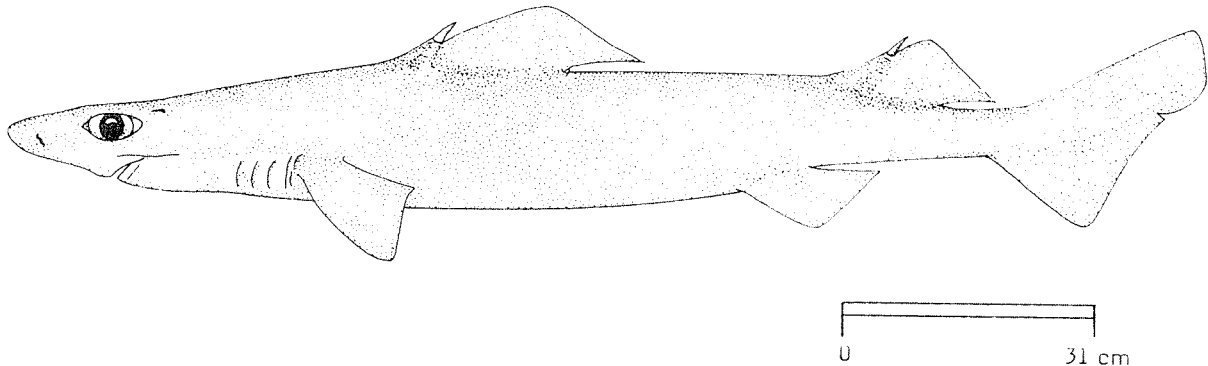
Presumably caught in bottom trawls.

Mode of utilization uncertain, probably for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Centrophorus squamosus (Bonnaterre, 1788)OTHER SCIENTIFIC NAMES STILL IN USE : Lepidorhinus squamosus (Bonnaterre, 1788)

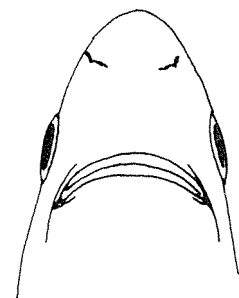
## VERNACULAR NAMES:

FAO :           En - Leafscale gulper shark  
                   Fr - Squalé-chagrin de l'Atlantique  
                   Sp - Quelvacho negro

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body elongate and slightly compressed; dermal denticles of back overlapping each other, with stalked, leaflike crowns, a strong main cusp and 3 or more side cusps on their posterior edges (number increasing with denticle replacement during growth), and ridges running the length of the crown. Snout pointed and moderately long, almost equal to mouth width but shorter than distance from mouth to pectoral fin origins. Teeth differing in upper and lower jaws; uppers much smaller, relatively broad and bladelike, with cusps varying from erect to semi-oblique (more erect in adult: males than in adult females and in immatures of both sexes) and without cusplets; lowers large, compressed, bladelike, with a single oblique cusp, no cusplets, a deeply notched outer edge, and serrations in adults. A short, strong spine with lateral grooves on anterior edges of both dorsal fins; first dorsal relatively low and long, second dorsal higher than first, its base about 2/3 the length of first dorsal base; inner corners of pectoral fins hardly elongated and not reaching the level of first dorsal spine, inner margins of pectoral fins shorter than distance from second dorsal spine to caudal origin; caudal fin with a strong subterminal notch. Caudal peduncle without dermal keels or precaudal pits.



underside of head

Colour: uniform dark grey.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Centrophorus granulosus, C. lusitanicus, C. moluccensis and C. uyato: dermal denticles of back low-crowned, widely separated, not leaf-shaped; inner corners of pectoral fins greatly elongated, reaching first dorsal spine.

No other species of Squalidae in the area combine bladelike upper and lower teeth without cusplets, grooved spines, relatively short snouts, angular pectoral free rear tips, leaflike denticles, no caudal keels or abdominal ridges, no precaudal pits, and a strong subterminal notch on the caudal fin.

**SIZE:**

Maximum: at least to 158 cm, males adult at about 100 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, off Aldabra and Assumption Islands, but probably more widespread. Elsewhere, just south of the area off the Cape and west coast of South Africa, Eastern Atlantic from Iceland to Zaire and Namibia, also Western Pacific from Japan, Philippine Islands, Australia and New Zealand.

A deepwater shark taken at depths from 800 to 900 m in the area, but elsewhere from 230 to 2 300 m depth near the bottom, and also pelagically in water 4 000 m deep, once speared in 3 m depth. Ovoviviparous, litters of 5 fetuses reported.

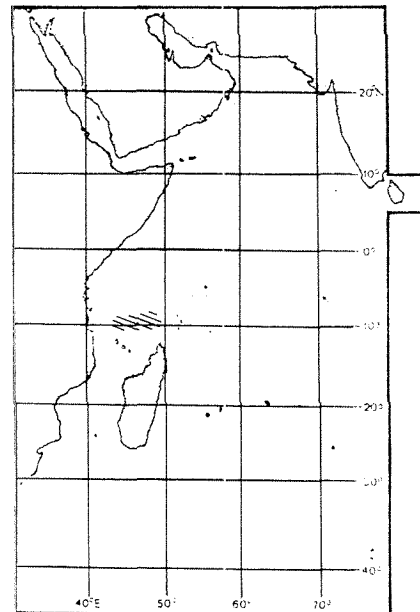
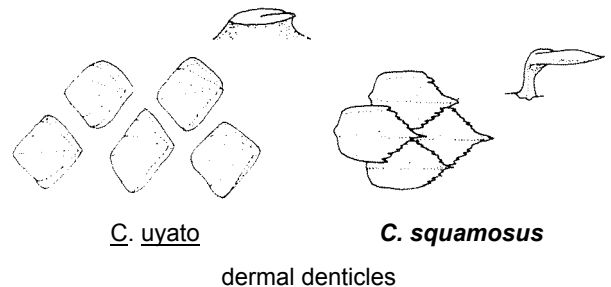
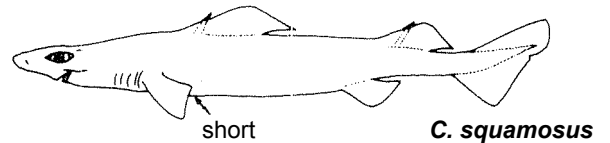
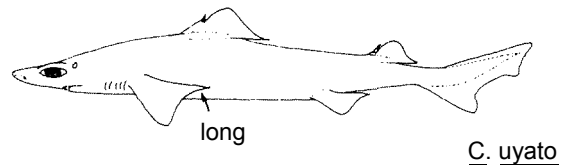
**PRESENT FISHING GROUNDS:**

Possibly offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Data on gear and utilization not recorded.

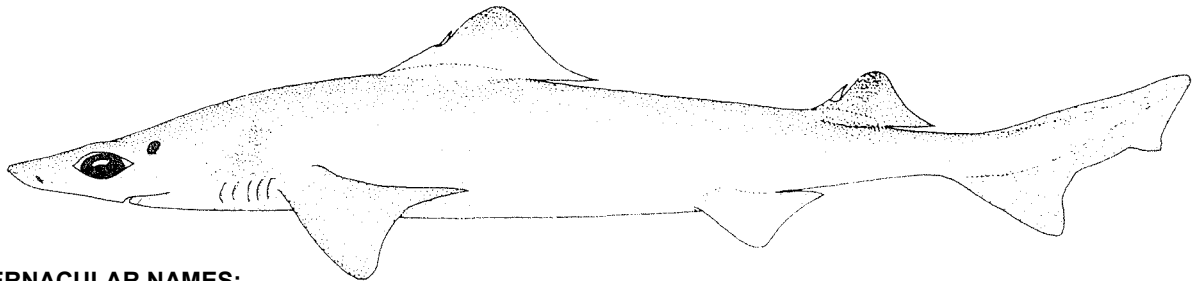


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Centrophorus uyato (Rafinesque, 1809)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Little gulper shark  
                  Fr - Petit squalé-chagrin  
                  Sp - Galludito

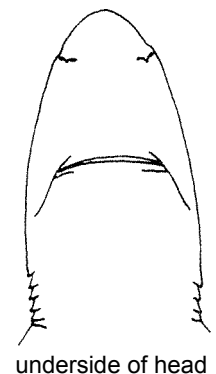


NATIONAL:

## DISTINCTIVE CHARACTERS:

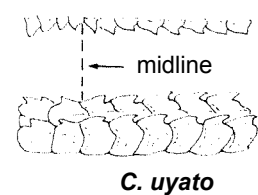
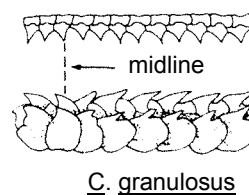
Body elongate and slightly compressed; dermal denticles of back widely separated, low-crowned, thornlike in young but broader in adults, with low ridges running the length of the crown and a very short cusp on their posterior edges. Snout pointed and slightly longer than mouth width but shorter than distance from mouth to pectoral fin origins. Teeth differing in upper and lower jaws, uppers much smaller, relatively broad and bladelike, with low, mostly oblique cusps (except for a few rows with erect cusps in the area of the symphysis) and no cusplets; lowers large, compressed, bladelike, with a single oblique cusp, no cusplets, a deeply notched outer edge, and no serrations in adults. A short, strong spine with lateral Grooves on anterior edges of both dorsal fins; first dorsal relatively high and short, second dorsal lower than first, its base about 3/4 the length of first dorsal base; inner corners of pectoral fins greatly elongated, produced as narrow, pointed lobes reaching past the first dorsal spine, their inner margins about as long as distance from second dorsal spine to upper caudal origin; caudal fin with a strong subterminal notch. Caudal peduncle without dermal keels or precaudal pits.

Colour: dark grey-brown above, lighter below, fins somewhat darker than back, rear edges white or transparent: a darker spot often above gill slits and eyes.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Centrophorus granulosus: a larger species with broadly rounded, cusplets denticles on the back of adults, with ridges not extending the length of crowns; upper teeth mostly erect-cusped; inner margins of pectoral fins somewhat longer than distance from second dorsal spine to upper caudal origin (but this may be variable in this species as well as in C. uyato, with some overlap); also, snout and head slightly broader and less pointed, oral cavity white (blackish in C. uyato).



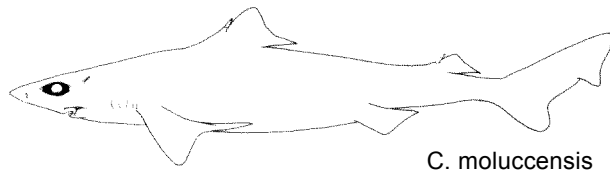
teeth

Centrophorus lusitanicus: a larger species with snout somewhat shorter, equal to or shorter than mouth length; first dorsal fin relatively long and low, second dorsal higher than first but its base only about 1/2 the length of first dorsal base.

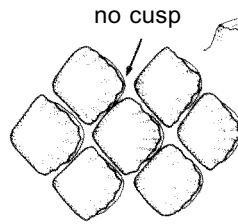
Centrophorus squamosus: dermal denticles of back with stalked, leaflike crowns overlapping each other; first dorsal fin relatively long and low, second dorsal higher than first; inner corners of pectoral fins hardly elongated and not reaching the level of first dorsal spine, inner margins of pectoral fins shorter than distance from second dorsal spine to caudal origin.

Centrophorus moluccensis: second dorsal fin reduced, half the height of first dorsal or less, origin of spine behind pelvic free rear tips.

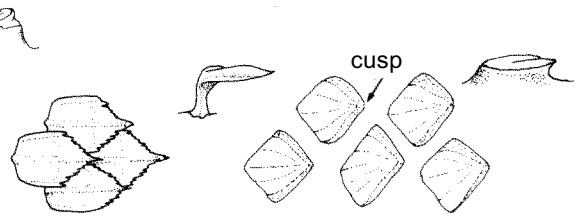
No other species of Squalidae in the area combine bladelike upper and lower teeth, grooved spines, relatively short snout, attenuated pectoral rear tips, no caudal keels or abdominal ridges, no precaudal pits, and a strong subterminal notch on the caudal fin.



C. moluccensis



C. granulatus

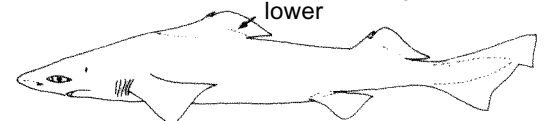


C. squamosus  
dermal denticles

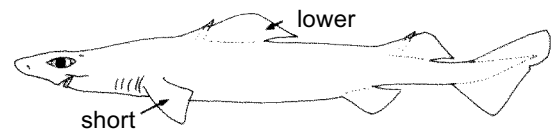
C. uyato



C. granulatus



C. lusitanicus



C. squamosus



C. uyato

**SIZE:**

Maximum: to about 100 cm total length, males mature at 85 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area it occurs from off South Africa and southern Mozambique, possibly also India, but likely more widespread in the area. Elsewhere wide-ranging in the Western North Atlantic, Eastern Atlantic and Mediterranean Sea, and possibly off Taiwan Island in the Western Pacific.

A little-known, relatively common deepwater shark taken along the outer continental shelf and uppermost slope in the area, from 250 m depth and below, but elsewhere ranging from 50 to 1 400 m. Ovoviviparous, number of young usually only one: size at birth between 40 to 50 cm.

Feeds on bony fishes and squids.

**PRESENT FISHING GROUNDS:**

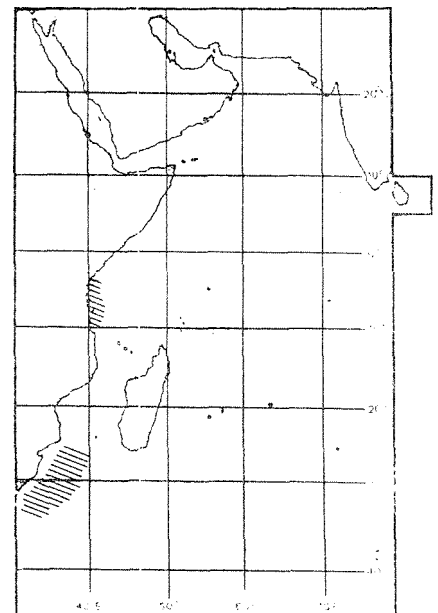
Offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

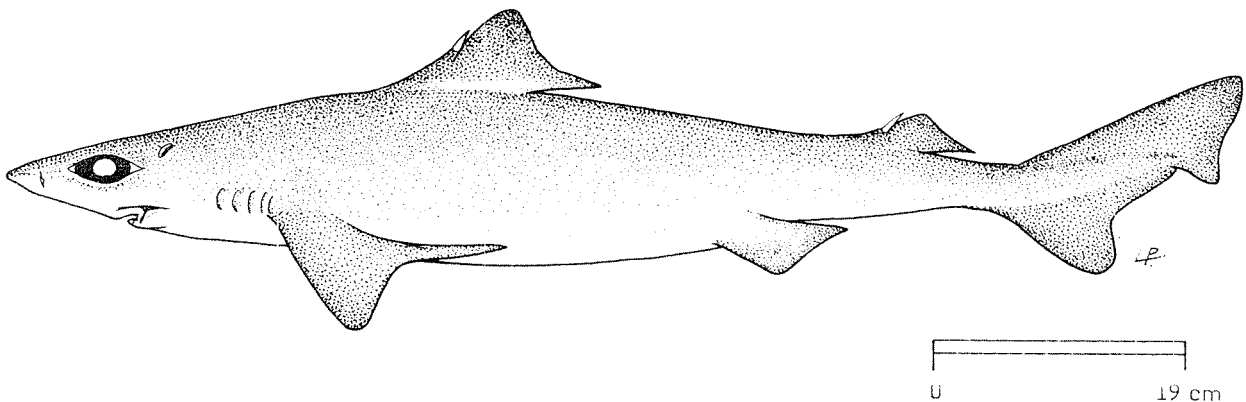
Probably taken in bottom trawls.

Utilized at least for fishmeal.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Centrophorus moluccensis Bleeker, 1860OTHER SCIENTIFIC NAMES STILL IN USE : Centrophorus scalpratus McCulloch, 1915  
Atractophorus armatus Gilchrist, 1922

## VERNACULAR NAMES:

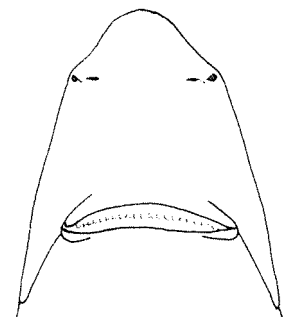
FAO : En - Smallfin gulper shark  
Fr - Squale-chagrin cacaon  
Sp - Quelvacho de aleta corta

NATIONAL:

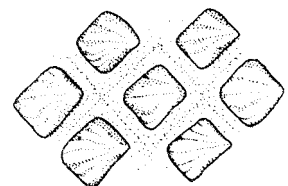
## DISTINCTIVE CHARACTERS:

Body elongate and slightly compressed: dermal denticles of back widely separated and not overlapping, low-crowned, thornlike in young but broader in adults, with low ridges running the length of the crown and a short cusp on their posterior edges. Snout pointed and moderately long, greater than mouth width but not as long as distance from mouth to pectoral fin origins. Teeth differing in upper and lower jaws, uppers much smaller, relatively broad and bladelike, with low oblique cusps and no cusplets; lowers large, compressed, bladelike, with a single oblique cusp, no cusplets, a deeply notched outer edge, and serrations in adults. A short, strong spine with lateral grooves on anterior edges of both dorsal fins; first dorsal relatively high and short, second dorsal very small, its height half height of first or less, its spine origin behind rear tips of pelvic fins; inner corners of pectoral fins greatly attenuated, produced as narrow, pointed lobes reaching past the first dorsal spine, their inner margins greater than distance from second dorsal spine to upper caudal origin; caudal fin with a strong subterminal notch. Caudal peduncle without dermal keels or precaudal pits.

Colour: grey-brown above, lighter below; fins slightly darker.



underside of head

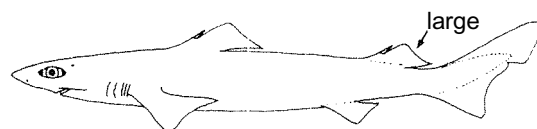


dermal denticles

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of Centrophorus: second dorsal fin larger, nearly equal to or greater than height of first dorsal fin, spine origin over pelvic inner margins.

No other species of Squalidae in the area combine bladelike upper and lower teeth, grooved spines, relatively short snouts, extremely elongated pectoral free rear tips, no caudal keels or abdominal ridges, no precaudal pits, and a strong subterminal notch on the caudal fin.



C. granulosus

## SIZE:

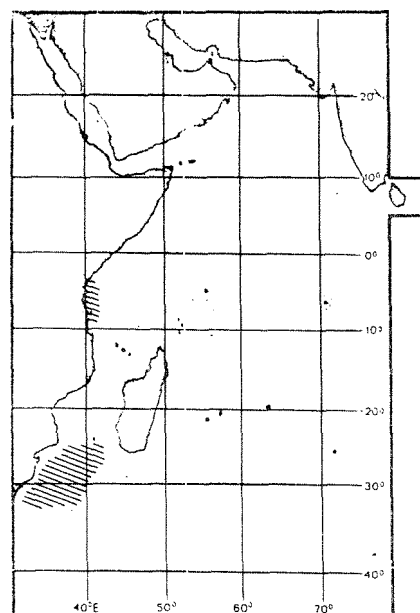
Maximum: about 98 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, from off South Africa and Mozambique, where it is very common; probably more widespread. Elsewhere, from the Western Pacific off Okinawa, possibly Taiwan Island, Amboina, New Hebrides, New Caledonia and Australia.

A deepwater bottom-dwelling shark, known from the outer continental shelf and upper slope at depths of 250 m or more, recorded elsewhere from 130 to 800 m. Oviparous, number of young 2 to a litter; size at birth 33 to 37 cm.

Feeds on bony fishes, including trichiurids and myctophids, squids, octopi, shrimps, and other squaloid sharks.



## PRESENT FISHING GROUNDS:

Offshore.

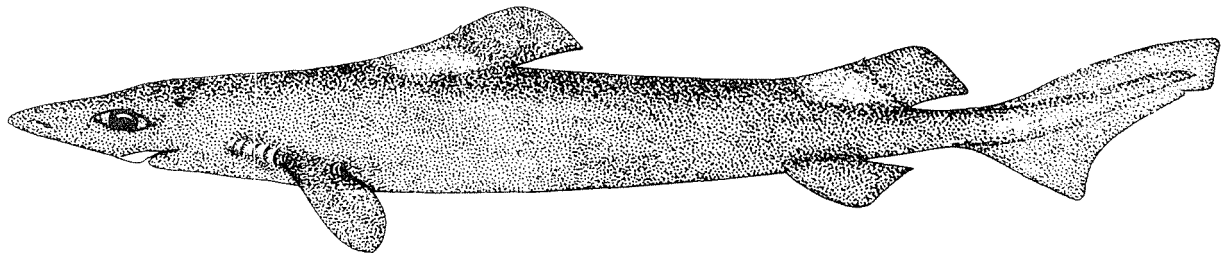
## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :

Separate statistics are not reported for this species.

Probably taken in bottom trawls; at least utilized for fishmeal.

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Centroscymnus crepidater (Bocage & Capello, 1864)OTHER SCIENTIFIC NAMES STILL IN USE : Centrophorus rossi Alcock, 1898

## VERNACULAR NAMES:

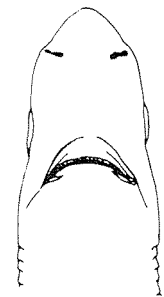
FAO :           En - Longnose velvet dogfish  
                  Fr - Pailona à long nez  
                  Sp - Sapata negra

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body moderately slender and compressed; dermal denticles of back with cusps and ridges in young and adults, the medial ridge not extending the full length of the crown. Snout narrowly rounded, very long, about equal to distance from mouth to origins of pectoral fins; upper labial grooves extremely long, the distance between their anterior ends less than their lengths (taken from their anterior ends to mouth angles); teeth differing in upper and lower jaws, uppers much smaller, with slender, erect cusps and no cusplets in the region of the symphysis, but broadening out near the mouth angles; lowers larger, compressed, bladelike, unserrated, with a single erect to oblique cusp, no cusplets and a deeply notched outer edge. A very small spine with lateral grooves on anterior edges of both dorsal fins; first dorsal fin very long and low, its base longer, but its height less than second dorsal, its origin about over the posterior ends of pectoral fin bases; pectoral fins shorter than upper margin of caudal fin, their inner corners broadly rounded; caudal fin with a well-developed subterminal notch and a weak lower lobe. Caudal peduncle without dermal keels or precaudal pits.

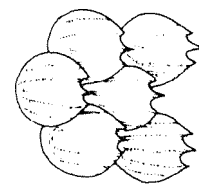
Colour: uniform brownish-black.



underside of head



teeth



dermal denticles

## **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

No other squalid sharks in the area have the combination of characters underlined above.

## **SIZE:**

Maximum: adults to about 90 cm, females mature at 82 cm.

## **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, off the Aldabra Island group and the Laccadive Sea, India, but likely more wide-ranging. Elsewhere in the Eastern Atlantic from Iceland to Namibia, New Zealand, Australia and central Chile.

A little-known deepwater shark, found on the upper continental slopes from 270 to 1 070 m depth. Ovoviviparous, number of fetuses reported about 4.

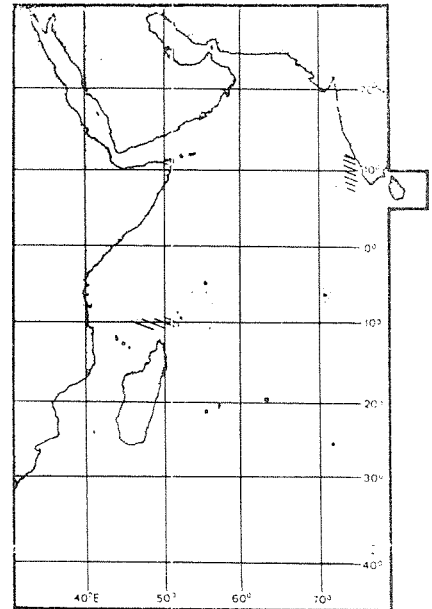
## **PRESENT FISHING GROUNDS:**

Offshore.

## **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :**

Separate statistics are not reported for this species.

Fishing gear and mode of utilization uncertain.

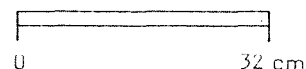
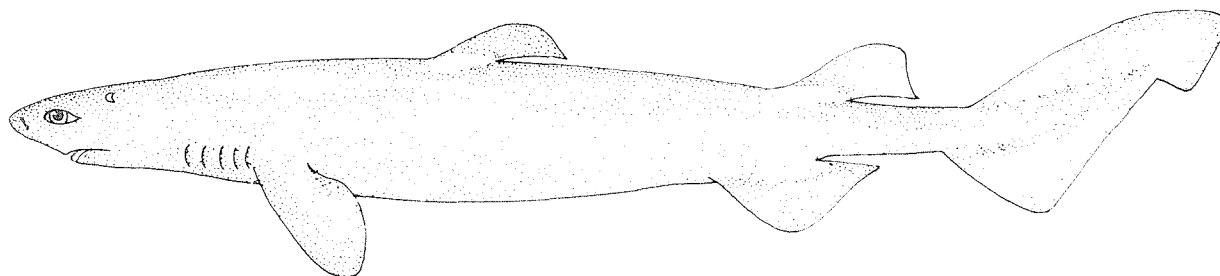


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Dalatias licha</i> (Bonnaterre, 1788)
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OTHER SCIENTIFIC NAMES STILL IN USE: *Scymnorhinus licha* (Bonnaterre, 1788)

## VERNACULAR NAMES:

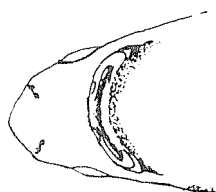
FAO :           En - Kitefin shark  
                  Fr - Squale liche  
                  Sp - Carochó

NATIONAL:

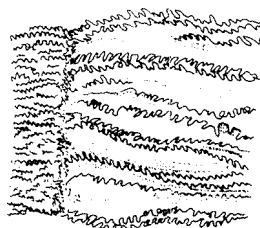
## DISTINCTIVE CHARACTERS:

A small to moderately large shark of cylindrical body; dermal denticles of back low, sessile, with short, pointed cusps and longitudinal ridges; eyes moderately large; snout rounded and conical, about as long as mouth width; lips very thick and fringed with transverse pleats and grooves; teeth differing in upper and lower jaws, uppers much smaller, not bladelike, with slender, erect to semi-oblique, needlelike cusps and no cusplets; lowers very large, bladelike, with a single, very broad, high, erect or semi-erect cusp, no cusplets, a shallow to deep outer notch and serrations. No spines on dorsal fins; first dorsal closer to pectorals than to pelvics, its origin posterior to inner corners of pectorals; second dorsal slightly larger than first; pectoral fins considerably shorter than upper caudal margin; caudal fin with subterminal notch strongly developed, its lower lobe very weak or undeveloped. Caudal peduncle without dermal keels or precaudal pits.

Colour: a uniform dark grey or chocolate brown, rear edges of fins light.



underside of head



fringed lips

upper and lower  
teeth on symphyses

dermal denticles



## **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The combination of characters underlined above readily separates this shark from all other squalids known in the area.

## **SIZE:**

Maximum: possibly to 192 cm, most adults between 100 and 150 cm.

## **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, off South Africa and southern Mozambique, but likely more wide-ranging. Elsewhere, in the Western North Atlantic, Eastern Atlantic from the North Sea to Cameroon, the Western Pacific from Japan, New Zealand and Australia, and the Central Pacific from the Hawaiian Islands.

A common bottom and midwater shark at the depths of 250 to 450 m in the area, but elsewhere ranging from 37 to 1 100 m. Ovoviviparous, number of young 3 to 16, size at birth about 30 cm. Found in schools or groups usually of one sex.

A powerful predator with exceptionally strong jaws that feeds on a wide variety of small to moderately large bottom and midwater bony fishes; also squids and octopi and on other sharks and skates.

## **PRESENT FISHING GROUNDS:**

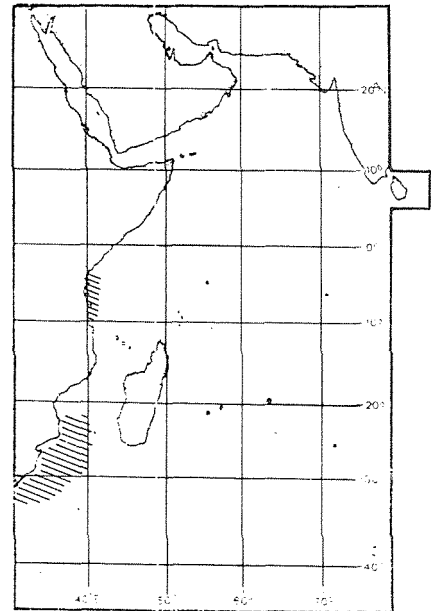
Offshore.

## **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls.

Utilized for fishmeal.

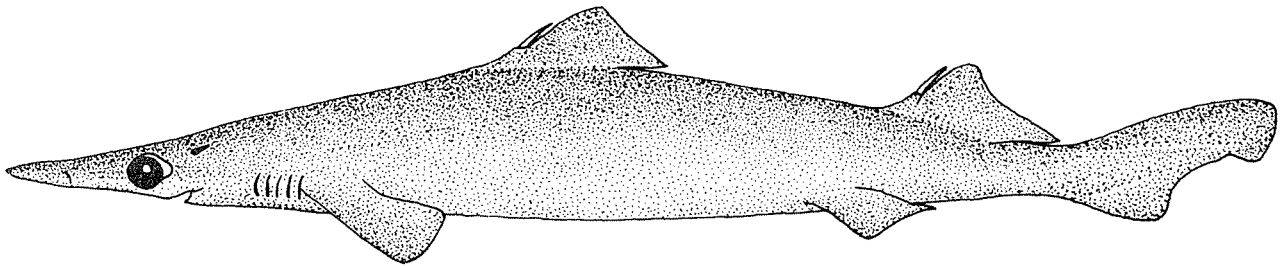


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)*Deania quadrispinosum* (McCulloch, 1915)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

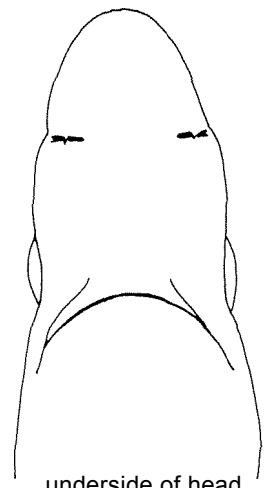
FAO: En - Longsnout dogfish  
Fr - Squale-savate à long nez  
Sp - Tollo trompalarga

NATIONAL:

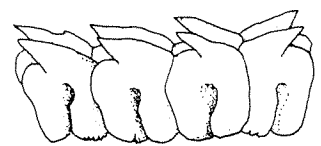
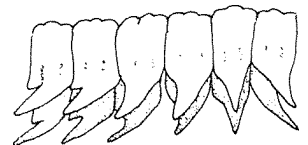
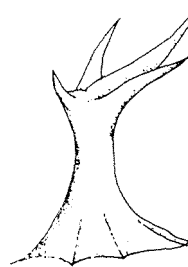
## DISTINCTIVE CHARACTERS:

Body moderately stout and compressed; dermal denticles of back with high crowns and cusps resembling small pitchforks. Snout extremely long, more so than distance from mouth to origin of pectoral fins; upper labial grooves moderately long, the distance between their anterior ends equal to or greater than their lengths (taken from their anterior ends to mouth angles); teeth unlike in upper and lower jaws, uppers smaller, broad and bladelike but with elongated, erect cusps and no cusplets; lowers much larger, bladelike, broad and unerrated, with erect or oblique cusps (more erect in adult males than adult females or juveniles of both sexes), no cusplets, and a deeply notched outer edge. A moderately large spine on first dorsal fin, and a much larger one on second dorsal, both spines with grooves; first dorsal fin moderately high, about the height of second dorsal or less, length from spine origin to free rear tip less than distance from rear tip to origin of second dorsal spine, first dorsal fin origin over or in front of rear tips of pectoral fins; pectoral fins short, with angular inner corners; caudal fin with a well-developed subterminal notch and a weak lower lobe. Caudal peduncle without dermal keels or precaudal pits.

Colour: dark brown above, paler below.



underside of head

teeth at centre  
of jaws

dermal denticle

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Deania profundorum: a smaller species closely resembling D. quadrispinosum and occurring in the area off Natal, South Africa, also elsewhere in the Eastern and Western North Atlantic and Western Pacific. It differs in having a low keel on the underside of the caudal peduncle (absent in D. quadrispinosum).

Deania calcea: apparently not recorded from the area, but reported to the southwest off the Cape coast of South Africa, and wideranging in the Eastern Atlantic, Western Pacific, and southeastern Pacific. Differs in its longer, low first dorsal fin, with the distance from the spine origin to its free rear tip equal to or greater than distance from its free rear tip to spine origin of second dorsal fin.

No other members of the family Squalidae in the area show the combination of pitchfork-shaped denticles on the back and an extremely long snout (longer than the distance from mouth to pectoral origins).

### SIZE:

Maximum: adults to about 114 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area it occurs off South Africa and southern Mozambique. Elsewhere, west along the Cape coast of South Africa to Namibia, and off southern Australia.

A little-known deepwater shark, occurring on the outer continental shelves and upper slopes at depths of 150 to 732 m. Presumably ovoviviparous, though young have not been recorded.

Feeds on small bony fishes.

### PRESENT FISHING GROUNDS:

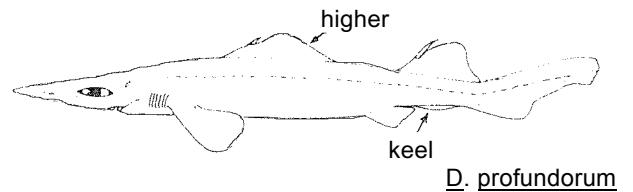
Uncertain.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

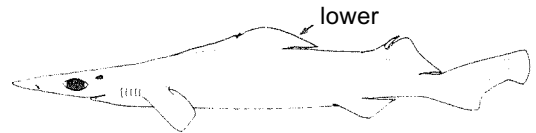
Separate statistics are not reported for this species.

Taken in bottom trawls.

Mode of utilization not recorded.



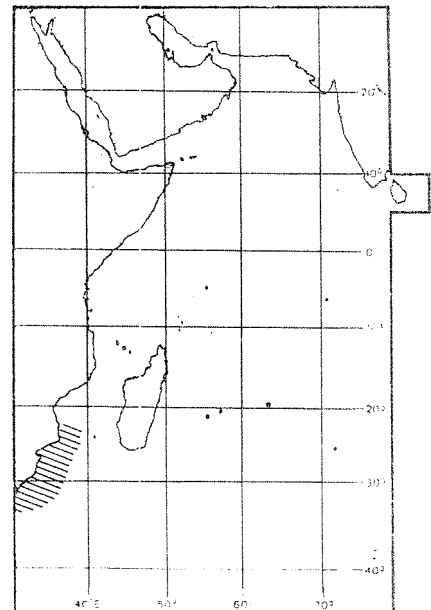
D. profundorum



D. calcea

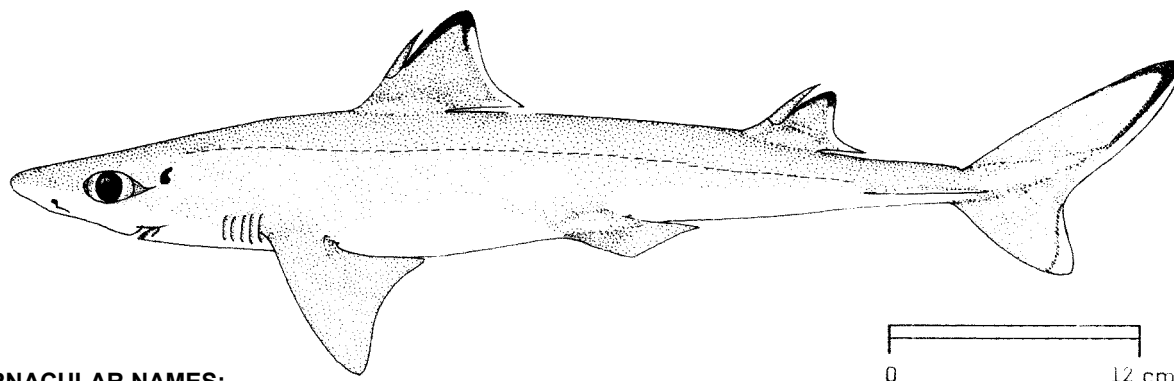


D. quadrispinosum



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Squalus megalops (Macleay, 1861)OTHER SCIENTIFIC NAMES STILL IN USE : Squalus acutipinnis Reqn, 1908

## VERNACULAR NAMES:

FAO: En - Shortnose spurdog  
Fr - Aiguillat nez court  
Sp - Galludo fiato

NATIONAL

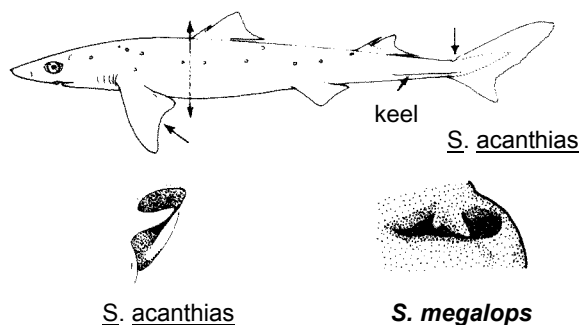
## DISTINCTIVE CHARACTERS:

Body moderately elongated and fusiform; denticles of back with slender, lanceolate crowns and a single cusp in adults. Snout pointed and slightly longer than mouth width, the distance from its tip to inner edge of nostril about equal to that from latter point to anterior end of upper labial groove; nostrils with elongated anterior flaps having short accessory lobes on their medial edges; teeth alike in both jaws, small, compressed, and with a single, strongly oblique cusp, a notched outer edge, and no cusplets or serrations. First dorsal fin larger and higher than second, its origin over inner margins of pectoral fins, close to pectoral fin insertions: a strong, moderately long un moved spine on both dorsal fins; first dorsal spine rather long, over inner margins of pectoral fins, its tip falling just below the fin apex; second dorsal spine longer and reaching above fin apex: pectoral fins rather broad, their inner corners usually acutely pointed and their posterior margins deeply concave; caudal fin asymmetrical, without a subterminal notch but with a strong ventral lobe. Caudal peduncle with a low lateral keel on each side and an upper precaudal pit.

Colour: dark brown or grey above, cream-white below; no white spots on sides.

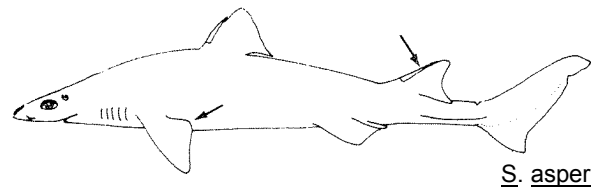
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Squalus acanthias Linnaeus, 1758: a cold and temperate water species currently not known from the area but found to the southwest, off the Cape coast of South Africa west to Namibia, and widespread elsewhere; might occur in the extreme southwest of the area in deep water. Differs from other species of Squalus in the following character combination: no accessory lobes on anterior nasal flaps; origin of first dorsal fin over or posterior to inner corners of pectorals; fin spines shorter, the first posterior to inner corners of pectoral fins; pectoral fins narrow and falcate; second dorsal fin smaller than first; precaudal pits present; ventral caudal fin lobe strong; and usually white spots on sides.

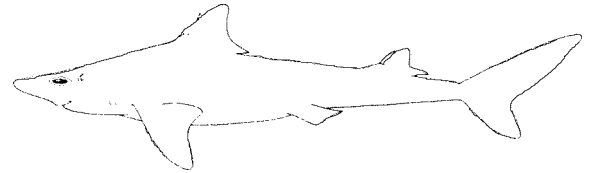
S. acanthiasS. megalops

left nostril

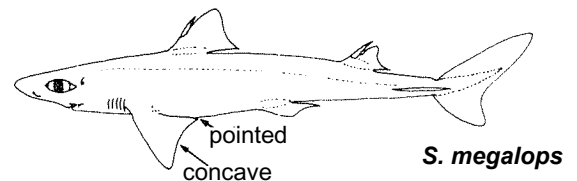
Squalus asper: snout broader and more blunt, origin of first dorsal fin over or behind pectoral rear tips; first dorsal spine longer, with origin behind pectoral rear tips; second dorsal fin as large as first; pectoral fins not falcate; ventral caudal fin lobe shorter; upper precaudal pit absent; dermal denticles of back with broad crowns and three cusps; size larger, to at least 114 cm.



Squalus cf. mitsukurri: denticles of sides broad and 3-cusped; distance from snout tip to inner edge of nostril greater than that from nostril to anterior end of upper labial furrow; pectoral fins with narrowly rounded inner corners and shallowly concave to nearly straight posterior margins.



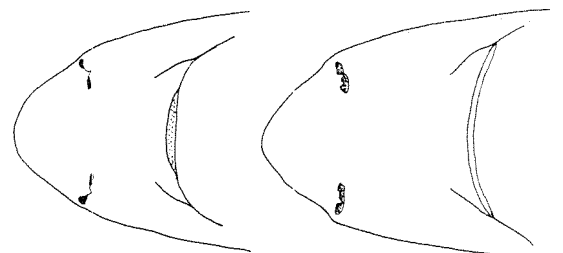
Other species of Squalidae: fin spines grooved or absent; usually caudal fin with a subterminal notch, no precaudal pits.



S. Cf. mitsukurri      S. asper      S. megalops  
dermal denticle

**SIZE:**

Maximum: about 71 cm, most adults between 40 and 70 cm.



S. cf. mitsukurri      S. megalops

underside of head

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, found off South Africa and southern Mozambique. but probably more widespread. Elsewhere, in the tropical and temperate Eastern Atlantic from Guinea to Namibia. and Western Pacific.

An offshore schooling shark found at moderate depths in the area from 50 to 450 m, where it is extremely common; elsewhere down to 732 m. Ovoviviparous, number of fetuses in a litter 2 to 4, size at birth between 18 and 24 cm.

Feeds primarily on bony fishes. also on cephalopods, crustaceans. and other elasmobranchs.

**PRESENT FISHING GROUNDS:**

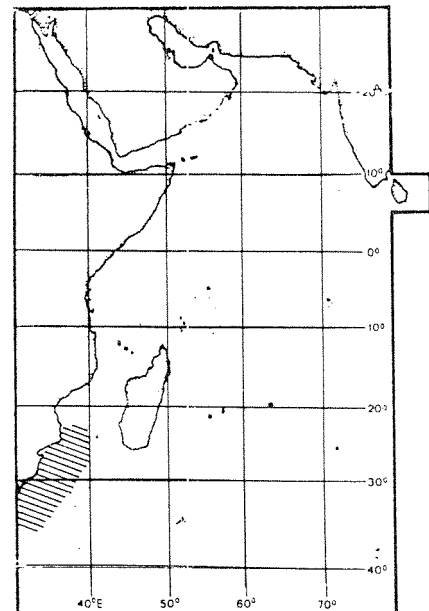
Probably offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Commonly taken in bottom trawls, and by hook and line (sports catches).

Minimally utilized for human consumption.

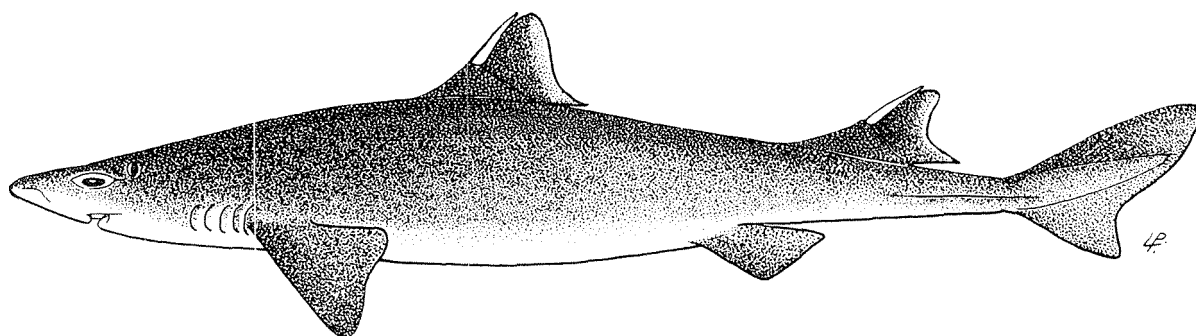


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Squalus asper Merrett, 1973

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

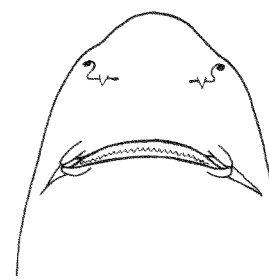
FAO: En - Roughskin spurdog  
Fr - Aiguillat à peau rugneuse  
Sp - Galludo raspa

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body moderately stout and fusiform; denticles of back with broad crowns, with 3 cusps in adults. Snout bluntly pointed, slightly greater than or equal to mouth width, the distance from its tip to inner edge of nostril about equal to that from latter point to anterior end of upper labial furrow; anterior flaps of nostrils with strong accessory lobes on their medial edges; teeth alike in both jaws, small, compressed, and with a single, strongly oblique cusp, a notched outer edge, and no cusplets or serrations. First dorsal fin about as large as second, its origin over or posterior to inner corners of pectorals; both dorsal fins with a very strong, long ungrooved spine; first dorsal fin spine long, its origin well posterior to inner corners of pectoral fins, its tip reaching fin apex; second dorsal spine long, reaching fin apex; pectoral fins broad, their inner corners broadly rounded and their posterior margins straight or nearly so; caudal fin asymmetrical, without a subterminal notch and with a short ventral lobe. Caudal peduncle with a low lateral keel on each side but without an upper precaudal pit.

Colour: dark brown above, lighter below; fins with prominent white posterior edges; no white spots on sides.



underside of head

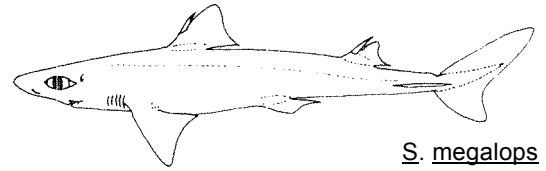


upper teeth and lower teeth

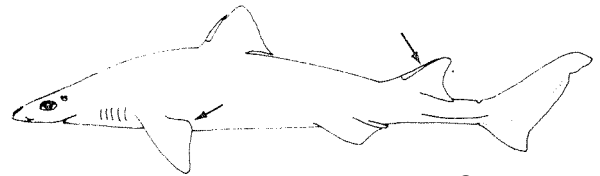
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of Squalus: snout more pointed, origin of first dorsal fin over or anterior to pectoral insertions, first dorsal fin spine shorter, with origin over pectoral inner margins, second dorsal fin noticeably smaller than first, pectoral fins more falcate, with posterior edges more or less concave and inner corners narrowly rounded to pointed, a more prominent ventral caudal lobe, and an upper precaudal pit.

Other species of Squalidae: fin spines grooved, or spines absent, usually a subterminal notch on caudal fin.



*S. megalops*



*S. asper*

## SIZE:

Maximum: about 118 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

In the area, from the Aldabra Island group, South Africa, and southern Mozambique, but likely more wide-ranging. Elsewhere from the Western North Atlantic and Central Pacific.

A little-known dogfish of the upper continental slopes and outermost shelves, from depths of 214 to 600 m. Ovoviviparous, number of fetuses 21 or 22; size at birth near 25 to 28 cm.

Feeds on bony fishes and squid.

## PRESENT FISHING GROUNDS:

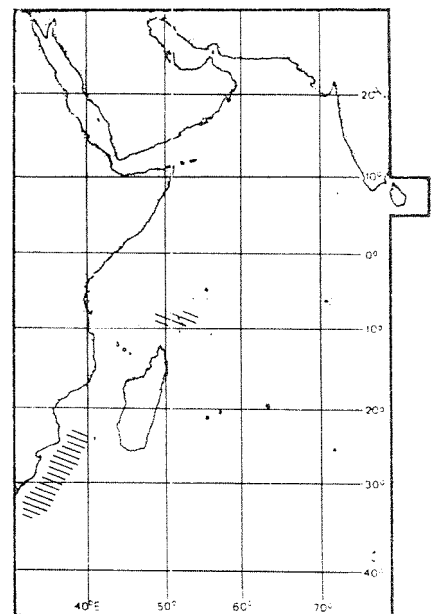
Uncertain.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Probably taken in bottom trawls.

Mode of utilization uncertain.

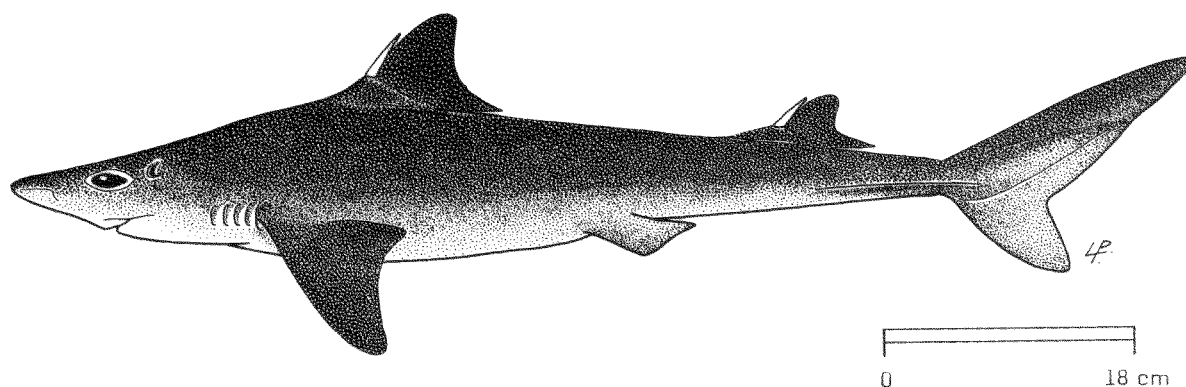


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUALIDAE

FISHING AREA 51  
(W. Indian Ocean)Squalus cf. mitsukurii Jordan & Snyder, 1903

## OTHER SCIENTIFIC NAMES STILL IN USE:

Squalus "fernandinus" not of Molina, 1782, in part;  
often misidentified as Squalus blainvillei (Risso, 1826)

## VERNACULAR NAMES:

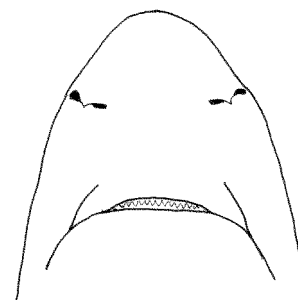
FAO: En - Shortspine spurdog  
Fr - Aiguillat épinette  
Sp - Galludo espinilla

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body moderately elongated and fusiform; denticles of back with broad crowns and 3 cusps in adults. Snout pointed, slightly longer than mouth width, the distance from its tip to inner edge of nostril greater than that from latter point to anterior end of upper labial groove; nostrils with elongated anterior flaps having short accessory lobes on their medial edges; teeth alike in both jaws, small, compressed, and with a single, strongly oblique cusp, a notched outer edge, and no cusplets or serrations; first dorsal fin larger and higher than second, its origin over inner margins of pectoral fins, close to pectoral fin insertions; a strong, moderately long, ungrooved spine on both dorsal fins, generally not reaching their apices; base of first dorsal spine over inner margins of pectoral fins; pectoral fins rather broad, their inner corners narrowly rounded and their posterior margins nearly straight; caudal fin asymmetrical, without a subterminal notch but with a strong ventral lobe. Caudal peduncle with a low lateral keel or, each side and an upper precaudal pit.

Colour: back more cm less dark brown, belly whitish.



underside of head



nostril



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Squalus megalops: differs in having slender, lanceolate denticles on back in adults, a shorter snout (distance from snout tip to inner edge of nostril about equal to that from latter point to anterior end of upper labial groove), pectoral fins with deeply concave posterior margins and acutely pointed inner corners (but they may be straighter, and with bluntly pointed inner corners in large adults).

Squalus asper: snout broader and blunt; origin of first dorsal fin over or behind pectoral fin rear tips; first dorsal spine longer, with origin behind pectoral rear tips; second dorsal fin as large as first; pectoral fins not falcate; ventral caudal fin lobe shorter; upper precaudal pit absent, dermal denticles of back with broad crowns and 3 cusps; size larger, to at least 114 cm.

Squalus blainvillei (Risso, 1826); currently not known from the area, but apparently wide-ranging (Eastern Atlantic and Western Pacific) and to be expected. Confused with the species in the Western Indian Ocean here provisionally referred to as S. mitsukurii, but differing in its higher first dorsal fin (height about equal to the fin base length versus about 2/3 of fin height in S. cf. mitsukurii) and longer fin spines that usually reach or extend above the dorsal fin apices.

Other species of Squalidae: fin spines grooved or absent, usually a subterminal notch on caudal fin, and no precaudal pits.

**SIZE:**

Maximum: to at least 95 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, off South Africa, southern Mozambique, Zanzibar, northern Madagascar, possibly also southern India. Elsewhere, S. mitsukurii is definitely found in the Western North Pacific off Japan, Korea, China and probably Taiwan Island and Vietnam, also or, seamounts in the North Pacific; very similar dogfish species, possibly identical to S. mitsukurii also occur in the Eastern Atlantic, and the Western South, Central and Eastern Pacific.

A common temperate and tropical offshore shark ranging in depth from 50 to 740 m. Ovoviviparous, number of fetuses 4 to 9; size at birth 22 to 26 cm.

Feeds on bony fishes, cephalopods and crustaceans.

**PRESENT FISHING GROUNDS:**

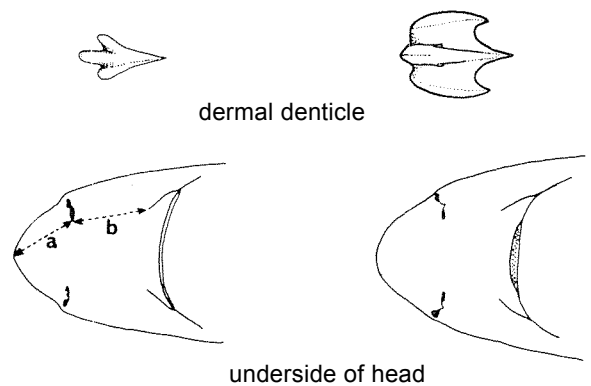
Offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

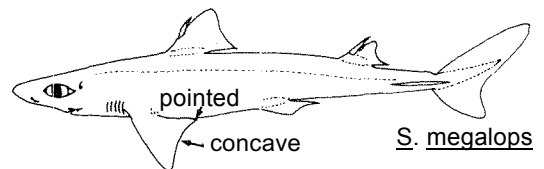
Caught in bottom trawls.

Little utilized in the area.

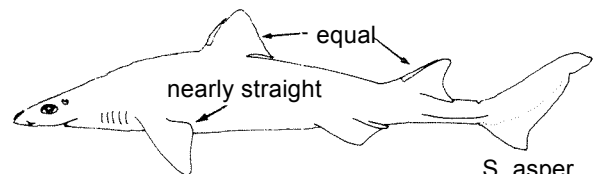


S. megalops

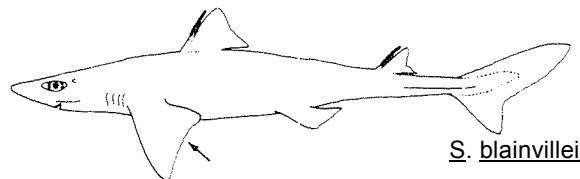
*S. cf. mitsukurii*



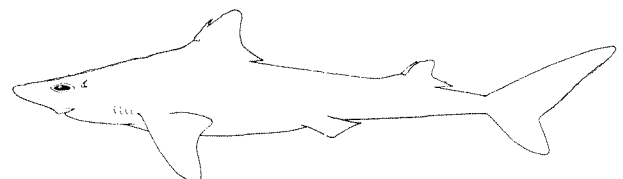
S. megalops



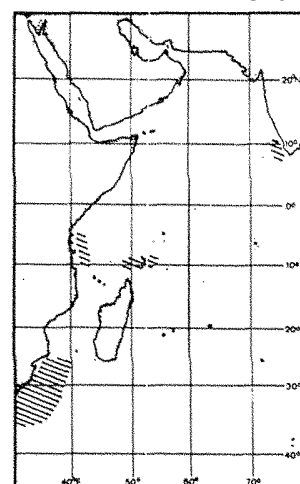
S. asper



S. blainvillei



*S. cf. mitsukurii*



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

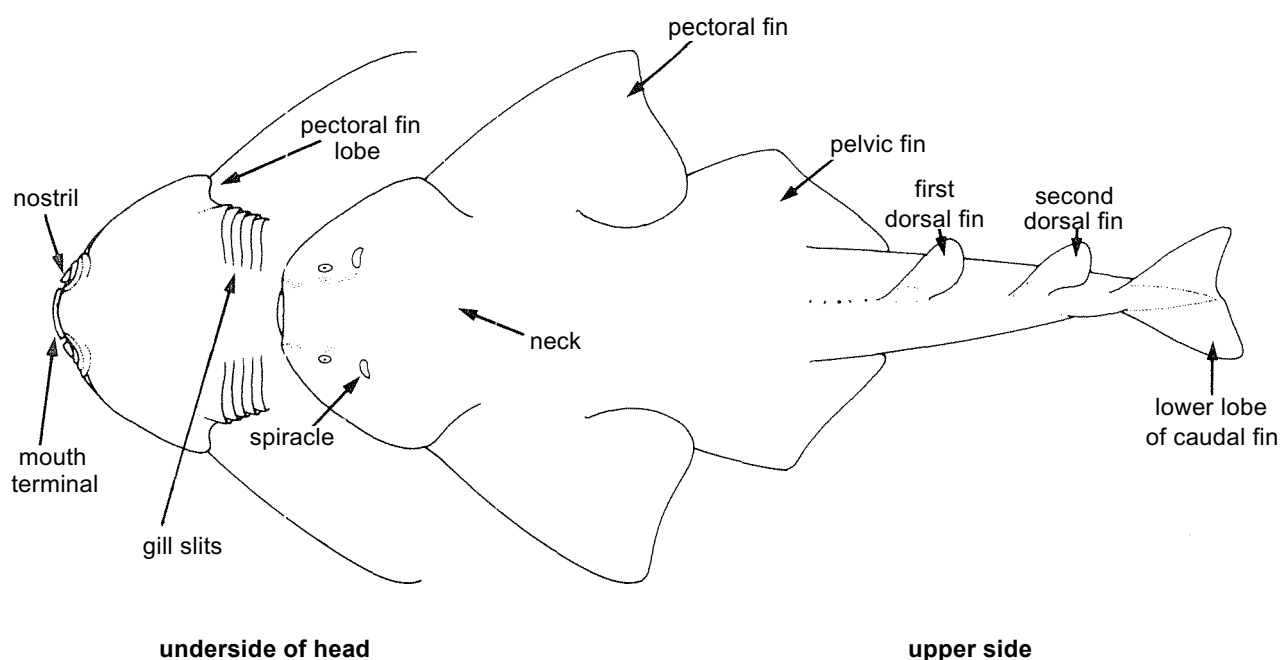
## SQUATINIDAE

## Angel sharks or sand devils

Moderately large, Flattened, raylike sharks. Head transversely oval or round, with a distinct neck at the pectoral fin bases; 5 pairs of moderately long gill slits situated ventrolaterally and not visible dorsally; no gill rakers; nostrils at tip of snout, with anterior flaps shaped as elaborate barbels; eyes on dorsal surface of head, without nictitating eyelids; mouth terminal, short and angular, extending under front of eyes when jaws are not protruded; teeth small, similar in both jaws, with a single, strong, needle-sharp cusp and no cusplets. Pectoral fins greatly enlarged, with a broad triangular lobe extending forward from their bases on either side of gill slits (but not fused to sides of head as in rays); pelvic fins enlarged and wing-like; 2 equally small, spineless dorsal fins located far rearward on tail, the first originating behind the pelvic fin bases; anal fin absent; caudal fin very short, nearly symmetrical but not lunate, its lower lobe slightly longer than the upper. Caudal peduncle moderately depressed, with a short, low, longitudinal keel on each side, but without precaudal pits. Intestine with an auger- or corkscrew-like spiral valve.

Colour: grey or brownish above, white below, with irregular darker markings or light ocelli.

Angel sharks are widely distributed and often abundant in cool temperate to tropical seas, ranging in depth from shallow inshore waters down to the upper continental slope. They are bottom-dwelling sharks, often burying themselves in sand or mud, and feed on small fishes and bottom invertebrates. Ordinarily harmless, but aggressive when provoked and capable of causing serious cuts with their small but needle-sharp teeth and strong jaws. Angel sharks are commonly caught in trawls but their use varies from region to region. Some are utilized for food and fishmeal; their skin makes good leather and shagreen for sanding wood.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

The combination of characters underlined above readily distinguishes the angelsharks from all other shark families in the area.

Rays (Batoidea): pectoral fins fused to head over ventral gill slits, no neck at pectoral fin bases, usually a ventral mouth, and lower lobe of caudal fin (when present) much shorter than the upper.

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Squatina africana Regan, 1908

SQUAT Squat 5

\*Squatina sp.?

Prepared by L.J.V. Compagno, Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, California, USA

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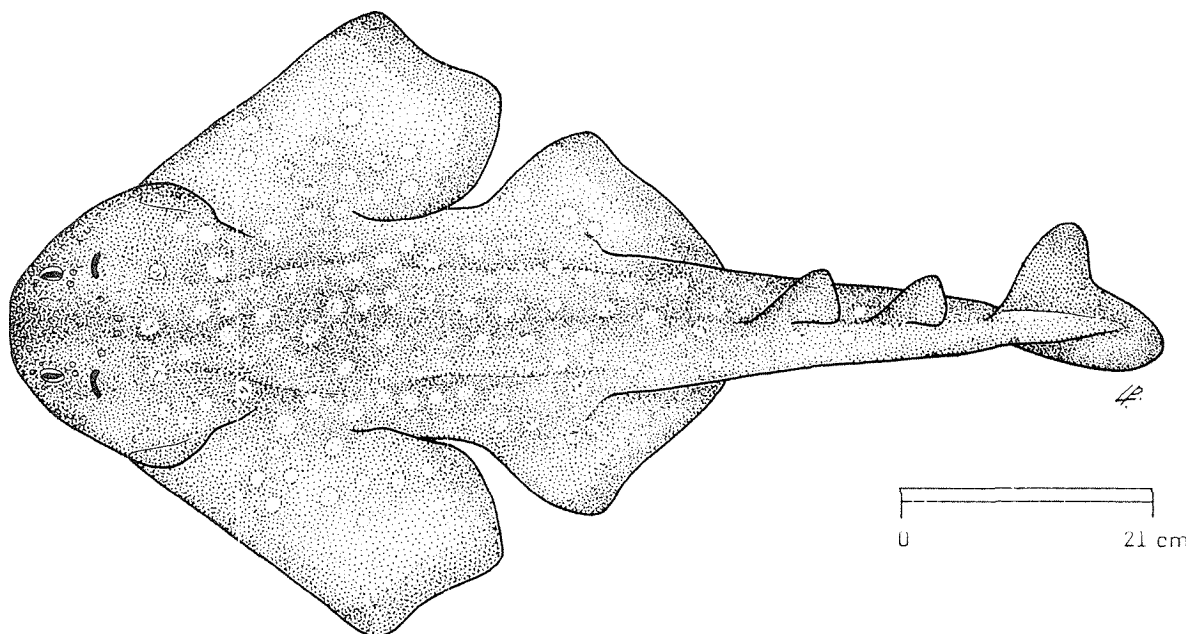
\* There is an old record of a Squatina from the Red Sea, listed as Squatina squatina (Linnaeus, 1758) but presumably not this Eastern North Atlantic and Mediterranean species. Recent records of Red Sea squatinids are not available

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SQUATINIDAE

FISHING AREA 51  
(W. Indian Ocean)*Squatina africana* Regan, 1908

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :       En - African angelshark  
               Fr - Ange de mer africain  
               Sp - Angelote africano

NATIONAL:

## DISTINCTIVE CHARACTERS:

A moderately large, flattened, raylike shark. Body greatly depressed and broad. Enlarged thorns or denticles present on head between eyes and spiracles and on nape, but none on midback. Head greatly depressed, nearly circular in dorsal view, with a distinct neck at pectoral fin origins; eyes moderately large, dorsal on head; 5 moderately long gill slits, ventrolaterally situated and concealed by the anterior pectoral fin lobes; spiracles very large; nostrils at tip of snout; nasal flaps not fringed, with a simple conical barbel; dermal folds on sides of head with a low triangular lobe opposite mouth corners; mouth terminal, short, extending below eyes; teeth in both jaws with a strong, short cusp and no cusplets; pectoral fins very large, angular, with a triangular anterior lobe; pelvic fins broad; first dorsal fin origin opposite or slightly posterior to free rear tips of pelvic fins; second dorsal fin about as large as first; anal fin absent; caudal fin short, nearly symmetrical, its lower lobe longer than the upper; caudal peduncle with a pair of short keels and a weak upper precaudal pit.

Colour: brown above, white below, back with a series of bold white spots marbled with brown.

### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The above characters of this species serve to distinguish S. africana from all other sharks and batoid fishes in the area, with the possible exception of other members of the genus Squatina (if any).

### **SIZE:**

Maximum: 108 cm.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Virtually confined to the area. Ranges south to East London on the South African coast, but commonest off Natal, and also present off southern Mozambique.

A bottom-dwelling shark, ranging from the surfline and the intertidal zone to at least 430 m depth. Ovoviviparous, number of developing ovae 7 to 11 and litters of young at least 7; size at birth between 28 and 34 cm.

Feeds on small bony fish, squid and octopi. Probably harmless, except when stepped on or otherwise provoked.

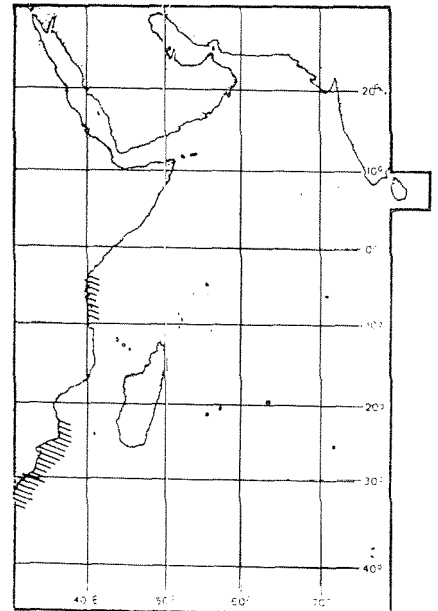
### **PRESENT FISHING GROUNDS:**

Natal and southern Mozambique.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls, apparently little utilized at present.



STEG

1983

FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

STEGOSTOMATIDAE

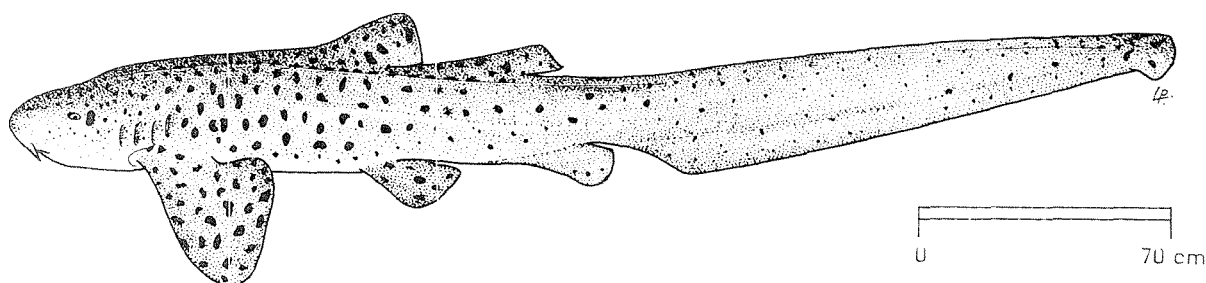
Zebra sharks

A single species in the area - see species sheet for:

Stegostoma fasciatum (Hermann, 1783) STEG Steg 1

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : STEGOSTOMATIDAE

FISHING AREA 51  
(W. Indian Ocean)Stegostoma fasciatum (Hermann, 1783)OTHER SCIENTIFIC NAMES STILL IN USE: Stegostoma varium (Seba, 1758)  
Stegostoma tygrinus or tigrinus (Bonnaterre, 1788)

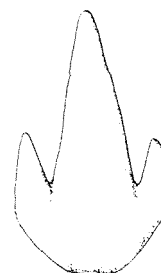
## VERNACULAR NAMES:

FAO : En - Zebra shark  
Fr - Requin zèbre  
Sp - Tiburón acebrado

NATIONAL:



underside of head



lower tooth

## DISTINCTIVE CHARACTERS:

A large shark. Head with 5 small slits, the last 3 behind pectoral fin origin and the last 2 very close to each other; no gillrakers; nostrils close to front of snout, with short barbels and nasoral grooves connecting them with the mouth but without circumnasal grooves; no nictitating lower eyelids; snout very short, broad and bluntly rounded; mouth short, nearly transverse, and far forward on head, well in front of eyes; teeth small, poorly differentiated in different regions of the mouth, with moderately long medial cusps and short cusplets on sides. Two dorsal fins, the base of the first extending forward of pelvic fin origins as a low keel that reaches level of pectoral fin bases but with insertion posterior to pelvic fin origins; second dorsal fin half the size of first or less; anal fin present, rounded but not keel-shaped, with its origin under rear third of second dorsal fin base; caudal fin nearly or quite half of total length, strongly asymmetrical, with a deep subterminal notch but with the lower lobe hardly developed. Caudal peduncle not strongly depressed, without lateral keels or precaudal pits, but with dermal ridges extending forward onto sides. Intestinal valve of ring type.



young

Colour: a strongly marked colour pattern, changing with growth. Young below 60 cm have the back dark brown or blackish, with vertical yellow bars, spots and reticulations, and the underside of the head, abdomen and tail whitish, but in subadults and adults the dark areas break up into scattered dark spots on a yellowish background, shading into the whitish ventral surface.

### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The barbels, nasoral grooves, anterior mouth, teeth, anteriorly elongated dorsal fin, lateral ridges on the sides, greatly elongated caudal fin about half the total length, and distinctive colour patterns of young and adults separate this shark from all others in the area.

### **SIZE:**

Maximum: possible 354 cm, most adults smaller.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, wide-ranging from South Africa and Madagascar to the Red Sea, Arabian Sea, the "Gulf", and coasts of Pakistan, India and Sri Lanka, as well as Mauritius. Elsewhere in the Eastern Indian Ocean and Western Pacific eastward to Japan, Australia and Palau.

A common inshore shark, often found on coral reefs, on or near the bottom. Oviparous, depositing eggs in rounded, oblong egg cases 10 to 17 cm long. Size of young at hatching between 20 and 36 cm.

Feeds primarily on molluscs but also takes small fishes.

### **PRESENT FISHING GROUNDS:**

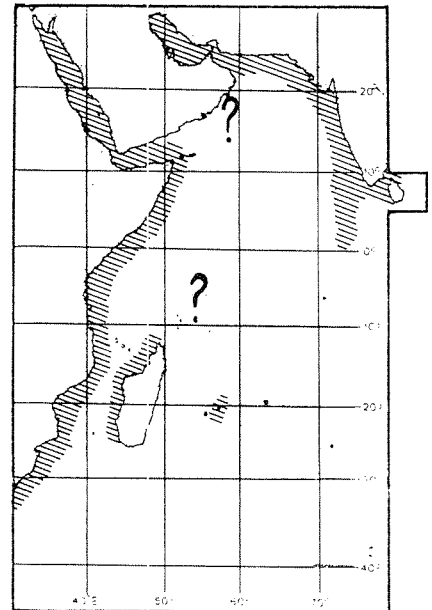
Pakistan, India and Sri Lanka.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls, in floating and fixed bottom gillnets, and with longlines.

Utilized fresh and dried-salted for human consumption; livers are processed for vitamins; fins dried for the oriental sharkfin trade; also processed for fishmeal.





## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

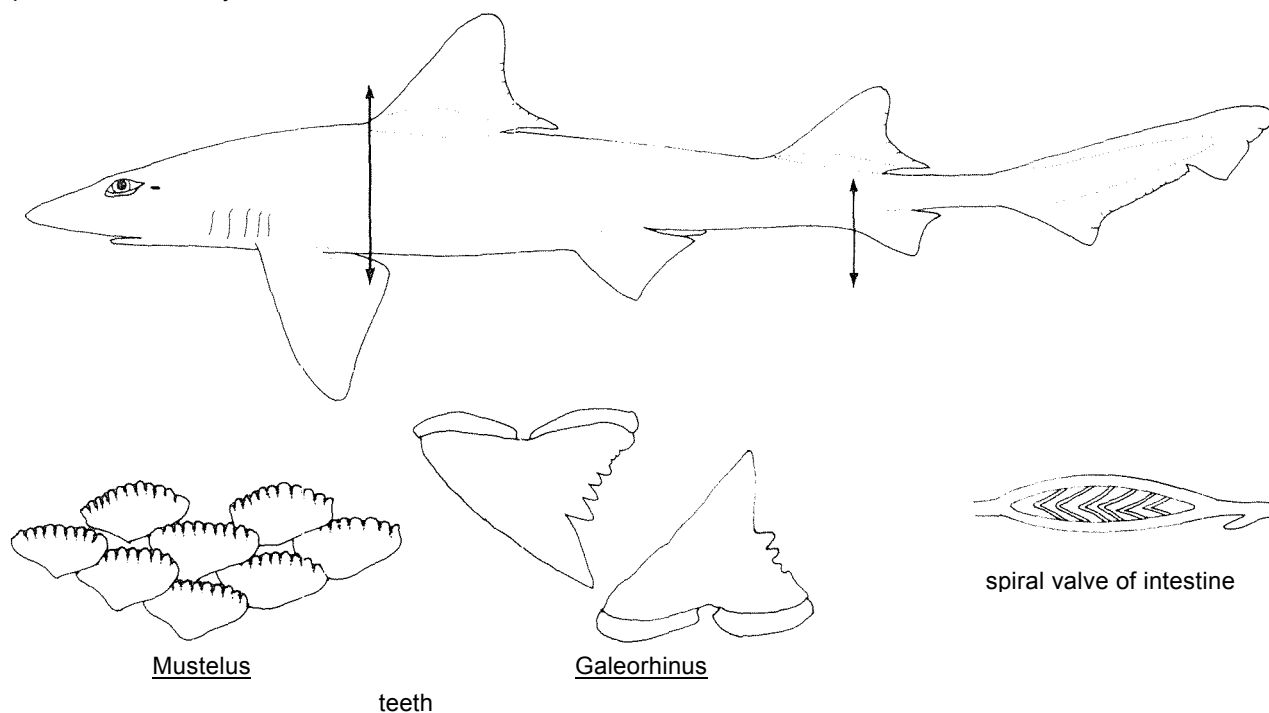
## TRIAKIDAE\*

Houndsharks, smoothhounds, topes

Body elongate and slender to moderately stout. Head with 5 gill slits, the last pair posterior to pectoral fin origins; small spiracles present; gill arches without rakers; eyes horizontally oval, situated on or above sides of head, with a nictitating eyelid partly or entirely within the eye opening; anterior nasal flaps of nostrils either broadly to narrowly expanded or greatly reduced, but not in the form of slender barbels; teeth either numerous, small, cusplless (or weak-cusped) arranged in a pavement (Mustelus) or larger, bladelike, with a strong cusp and small cusplets but no serrations (Galeorhinus); mouth ending below or posterior to eyes; labial furrows moderately long. Two dorsal fins, the first much shorter than caudal fin and with its base entirely anterior to pelvic fins; second dorsal fin somewhat smaller than the first, originating ahead of anal fin; anal fin as large as or smaller than the second dorsal; caudal fin asymmetrical, its lower lobe varying from virtually absent to strong, its upper edge not rippled. Caudal peduncle not flattened dorso-ventrally or expanded laterally, without keels or precaudal pits. Intestine with a corkscrew or auger-like spiral valve, with 6 to 10 turns.

Colour: back usually greyish brown, belly white. Some species are capable of undergoing slow colour changes.

Houndsharks are widely distributed in tropical and warm temperate to cold seas, ranging from shallow to moderately deep waters (300 m or more). They feed on bottom-dwelling invertebrates (especially crustaceans, but also molluscs and worms), and also on small bony fishes and fish egos. Smoothhounds (Mustelus) and topes or soupfin sharks (Galeorhinus) are important commercial species, but only the former are widely utilized in the area. Species of Mustelus, Triakis, Scylliogaleus, Galeorhinus, and Hypogaleus are hooked by sportsfishermen off South Africa and southern Mozambique, but little-utilized for food or other purposes. Separate statistics are not reported for this family.



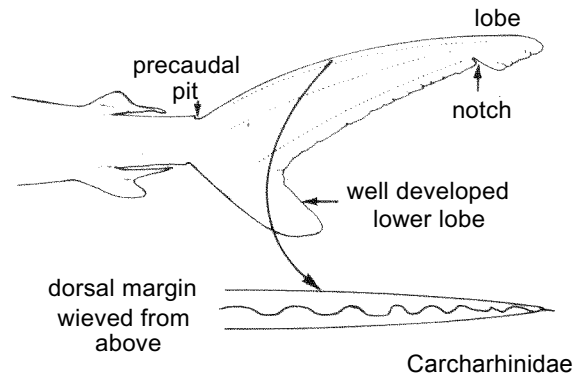
\*Family diagnosis only applies to species present in the area

**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Carcharhinidae and Hemigaleidae: upper edge of caudal fin with a rippled or undulating margin; precaudal pits present; teeth more or less unlike in upper and lower jaws (for the species in the area). Furthermore, Carcharhinidae with an intestinal valve of scroll type.

Proscylliidae: gillraker papillae present on internal gill openings; nictitating lower eyelids not well developed, of rudimentary type, with a weaker subocular pocket and a poorly differentiated secondary lower eyelid edge; teeth with slender cusps, comblike at ends of dental bands; first dorsal fin base in species in the area more posterior, closer to the pelvic than to the pectoral fin bases.

No other sharks in the area combine nictitating lower eyelids, small spiracles, mouth under the eyes, well-developed labial furrows, 2 spineless dorsal fins with the first over the interspace between the pectoral and pelvic fins, no precaudal pits, and an anal fin.



Carcharhinidae



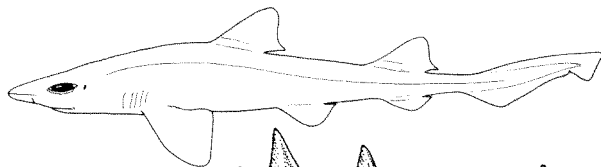
rolled



unrolled

intestinal valve of scroll type

Carcharhinidae



lower teeth



comblike rear teeth

Proscylliidae

**KEY TO GENERA AND SPECIES OCCUR[ING IN THE AREA:**

1a. Anterior nasal flaps very large, meeting each other at midline of snout and overlapping mouth posteriorly; nasoral grooves present between nostrils and mouth (Figs 1a, 2) ..... Scylliogaleus queckettii

1b. Anterior nasal flaps smaller, widely spaced from each other and not meeting mouth; no nasoral grooves (Figs 1 b,c,7)

2a. Ventral caudal fin lobe very long at all stages; second dorsal fin markedly smaller than first, half its area or less (Figs 3,4); nostrils with rudimentary anterior nasal flaps (Figs 1b,c)

3a. Mouth angular, with lower teeth protruding from mouth (Fig.1b); second dorsal fin considerably larger than anal fin; terminal lobe of caudal fin about a third of length of dorsal caudal fin margin (Fig.3) ..... Hypogaleus hyugaensis

3b. Mouth arcuate, with lower teeth not protruding from mouth (Fig.1e); second dorsal fin about as large as anal fin; terminal lobe of caudal fin about half the length of dorsal caudal fin margin (Fig.4) ..... Galeorhinus galeus

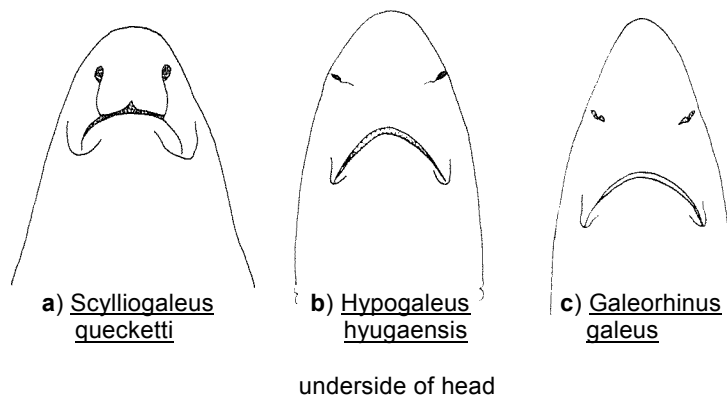
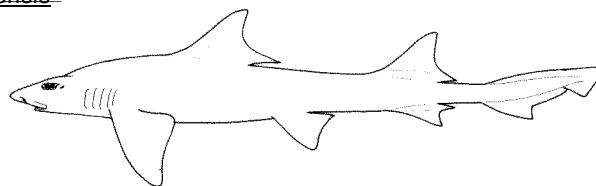
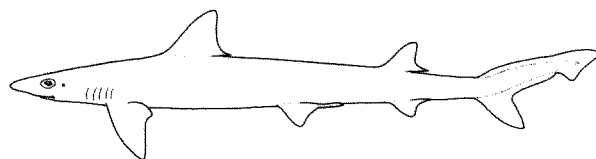


Fig.1



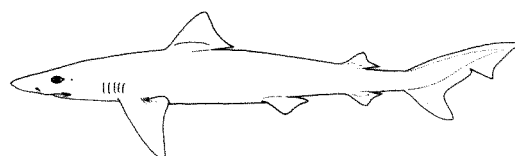
Scylliogaleus queckettii

Fig.2



Hypogaleus hyugaensis

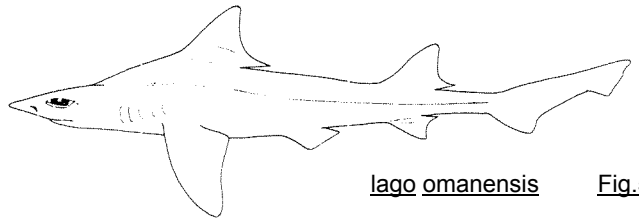
Fig.3



Galeorhinus galeus

Fig.4

2b. Ventral caudal fin lobe absent or short in adults, weak or absent in young; second dorsal fin nearly as large as first, 2/3 or more of its area (Figs 5,8,9,10); nostrils with short anterior nasal flaps (Fig.7)

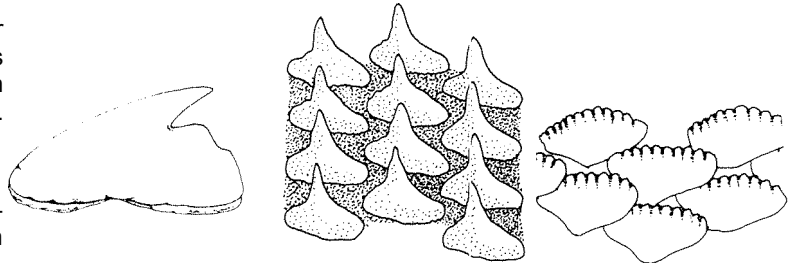


lago omanensis Fig.5

4a. Origin of first dorsal fin far forward, over pectoral fin bases (Fig.5); teeth compressed and bladelike (Fig.6a); subocular ridge obsolete .....

lago omanensis  
and lago species

4b. Origin of first dorsal fin further back, over inner margins of pectorals or behind them (Figs 8,9,10); teeth not compressed and bladelike (Fig. 6b,c); subocular ridge strong.



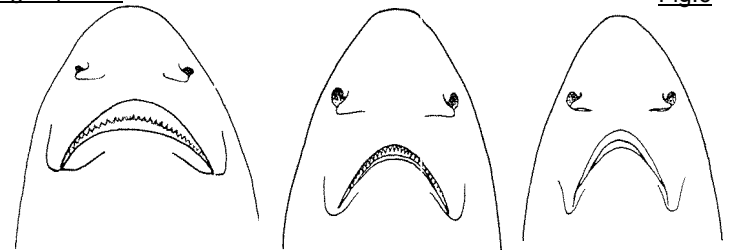
a) lago omanensis      b) Triakis megalopterus      c) Mustelus sp.

5a. Snout bluntly rounded in dorso-ventral view; thick and blunt in lateral view; mouth arcuate, lower jaw with convex edges (Fig.7a); teeth with stout cusps (Fig.6b); body often with black spots (Fig.8) .....

Triakis megalopterus

Fig.6

5b. Snout parabolic in dorsoventral view, angular and pointed in lateral view; mouth angular, lower jaw with straight or nearly straight edges (Fig.7b,c); teeth with cusps absent or virtually so (Fig.6c); body without black spots (Figs 9,10) .....



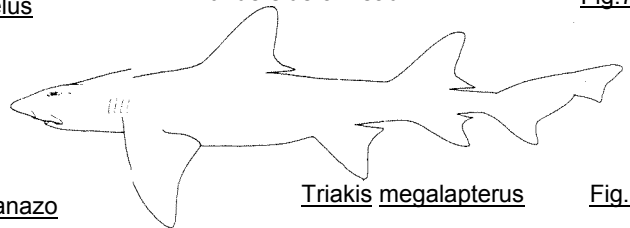
a) Triakis megalopterus      b) Mustelus manazo      c) Mustelus mosis

underside of head

Fig.7

6a. Upper labial furrows noticeably longer than lowers (Fig.7b); body usually with numerous white spots on its dorsal surface (Fig.9) .....

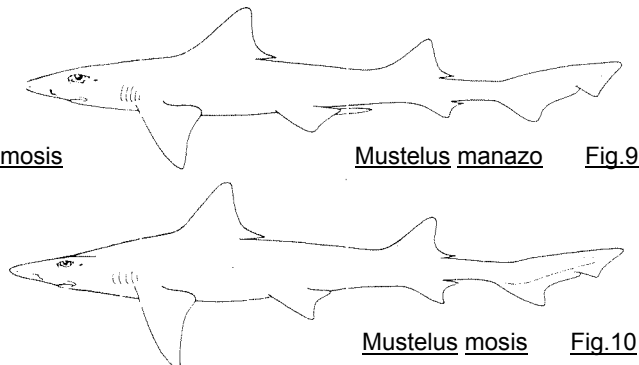
Mustelus manazo



Triakis megalapterus Fig.8

6b. Upper labial furrows about as long as or slightly longer than lowers (Fig.7c); body unspotted (Fig.10) .....

Mustelus mosis



Mustelus manazo Fig.9

Mustelus mosis Fig.10

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code number are given for those species for which Identification Sheets are included

*? <u>Galeorhinus galeus</u> (Linnaeus, 1758)	
<u>Hypogaleus hyugaensis</u> (Miyosi, 1939)	TRIAK Hypo 1
<u>Iago omanensis</u> (Norman, 1939)	TRIAK Iago 1
** <u>Iago</u> species	
*** <u>Mustelus manazo</u> Bleaker, 1854	TRIAK Must 6
<u>Mustelus mosis</u> Hemprich & Ehrenberg, 1899	TRIAK Must 7
<u>Scylliogaleus queckettii</u> Boulanger, 1902	TRIAK Scyl 1
*? <u>Triakis megalopterus</u> (Smith, 1849)	

Prepared by L.J.V. Compagno, Tiburon Center of Environmental Studies, San Francisco State University, Tiburon, California, USA

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\*Including 2 species, Galeorhinus galeus and Triakis megalopterus, that occur in the Cape region of South Africa but which might intrude into the area from the south

\*\*A new species from the Arabian Sea and southwestern India, to be described by the writer

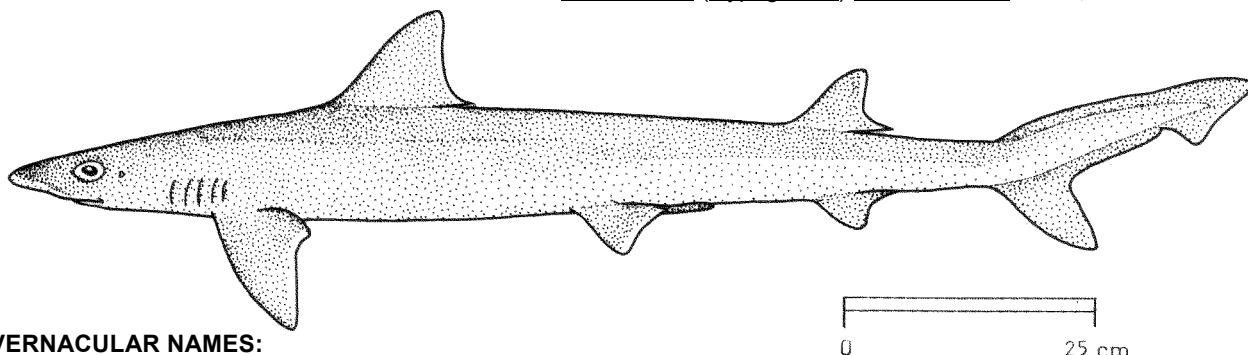
\*\*\*Mustelus species after unpublished work by Or Phillip C. Heemstra (1973 Ph.D. thesis and pers. comm.). Mustelus species from the area are usually described to M. manazo, but the common species of Mustelus in the northern part of the area from the Red Sea to India and Sri Lanka is M. mosis; and M. manazo, contrary to many references in the literature, is not currently known from these waters. However, the South African shark M. palumbes Smith, 1967 is apparently a junior synonym of Mustelus manazo, which extends the range of the latter from the Western Pacific and Eastern Indian Ocean into the area (P.C. Heemstra, 1973, Ph.D. thesis and pers. comm.). Apart from the characters presented in the key, Mustelus mosis also differs from M. manazo in having a number of hypercalcified skeletal structures, most prominently the rostrum (the hypercalcified rostral mass can be located in this species by pinching the snout); and in being viviparous, with a yolk-sac placenta (M. manazo is ovoviviparous). In addition, an eastern Atlantic species of Mustelus, M. mustelus (Linnaeus, 1758 reaches the Cape of Good Hope, South Africa, but is riot definitely known to occur in the area. It is similar to M. mosis but differs in not having a hypercalcified rostrum, averaging more precaudal vertebral centra, and in having the palate covered with denticles posteriorly only to the spiracular apertures and the mouth floor with denticles only on tongue tip (reaching at least to the first gill slits on the palate and at least to the third gill slits on the mouth floor in M. mosis)

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIAKIDAE

FISHING AREA 51  
(W. Indian Ocean)Hypogaleus hyugaensis (Miyosi, 1939)

## OTHER SCIENTIFIC NAMES STILL IN USE:

Hypogaleus zanzibariensis (Smith, 1957)Galeorhinus (Hypogaleus) zanzibariensis Smith, 1957

## VERNACULAR NAMES:

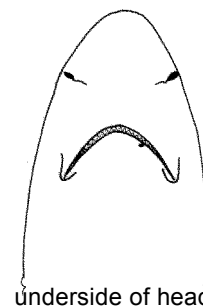
FAO :           En - Blacktip tope  
                  Fr - Requin-hâ élégant  
                  Sp - Cazón elegante

NATIONAL:

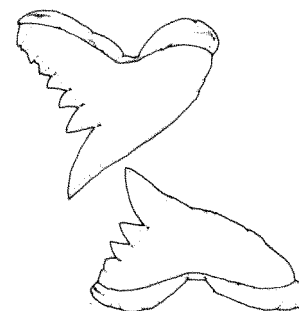
## DISTINCTIVE CHARACTERS:

A small to moderate-sized shark with an elongated body. Head flattened above and below, snout relatively long and narrowly rounded; nostrils with very small nasal flaps, not formed as barbels or greatly expanded, without nasoral grooves; 5 gill slits, the last 2 above pectoral fin bases; eyes horizontally oval on sides of head, with well-differentiated nictitating lower eyelids entirely, or almost entirely, inside the eye openings; spiracles very small; mouth angular, with moderately long labial furrows that do not reach front of mouth; teeth small, alike in both jaws, compressed, bladelike; lateral teeth with short, oblique cusps and outer cusplets only; anterior teeth more symmetrical, smaller, with both inner and outer cusplets. First dorsal fin on back between pectoral and pelvic fin bases, its origin just behind free rear tips of pectoral fins, base of fin closer to pectoral than to pelvic fin bases; second dorsal fin about 2/3 as large as first dorsal and twice as large as anal fin, its origin anterior to origin of latter; caudal fin with a strong loner lobe and a moderately long terminal lobe about 1/3 as long as upper edge of fin. Interdorsal ridge absent; caudal peduncle without keels or precaudal pits. Denticles on sides broad, strongly cuspidate and ridged, with strong side cusps in adults.

Colour: grey above, white below; dorsal fins and upper caudal lobe with black tips.



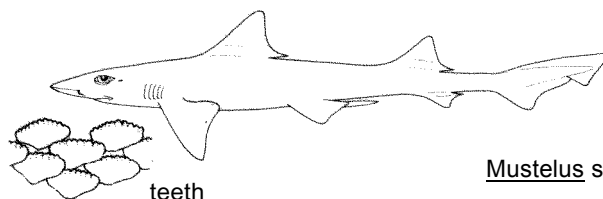
underside of head



upper and lower teeth

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

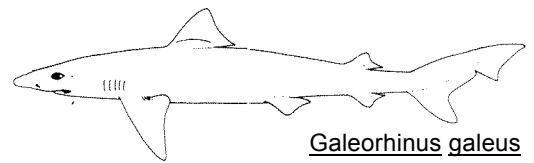
Mustelus species: interdorsal ridge present; denticles on sides with weak side cusps or none; eyes dorsolateral on head; anterior nasal flaps broader, larger; teeth not bladelike, their crowns low and rounded, forming a pavement; caudal fin with a weak or undeveloped lower lobe.



teeth

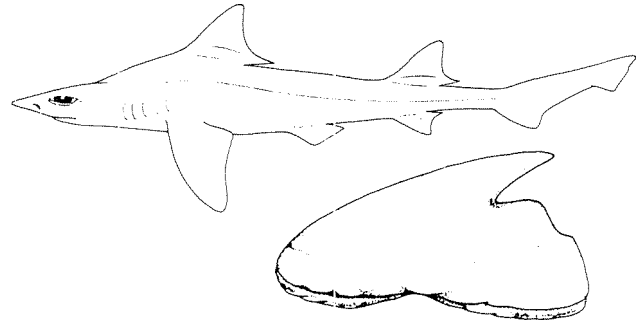
Mustelus sp.

Galeorhinus galeus: a temperate-water shark occurring on the Cape coast of South Africa just south of the area, and rather similar to this species, but differing in its longer snout, rounded mouth, smaller second dorsal fin about as large as the anal fin but less than half the size of the first dorsal, and a much longer terminal lobe on the caudal fin (about half as long as upper edge of fin).



Galeorhinus galeus

Iago species: smaller sharks without cusplets on their bladelike teeth, first dorsal origin over rear ends of pectoral fin bases, second dorsal fin nearly as large as first dorsal, caudal fin with lower lobe weak or hardly developed.



upper tooth

Iago omanensis

Small species of Hemigaleidae and Carcharhinidae: caudal fin with a rippled upper edge, no precaudal pits, and no supraorbital crests on the cranium. Carcharhinidae also with a scroll intestinal valve, and Hemigaleidae with upper teeth strongly differentiated from lowers.

**SIZE:**

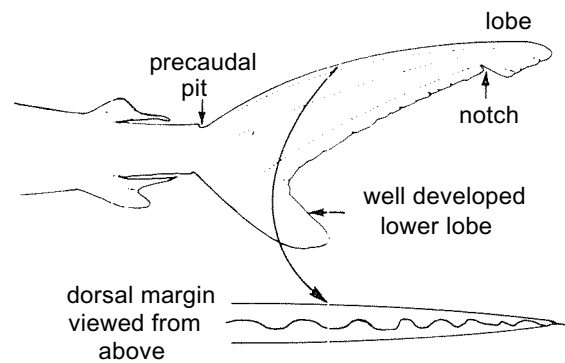
Maximum: about 127 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, from off South Africa, Kenya and Zanzibar, but probably more wide ranging. Elsewhere from the Western Pacific, off Taiwan Island and Japan.

A bottom-living shark of deepish continental waters, ranging in depths in the area from 65 to 230 m, but elsewhere up to 40 m. Viviparous, with a yolk-sac placenta, number of fetuses in a litter 11; size at birth near 35 cm (size of full-term fetuses).

Feeds on bony fishes.



Carcharhinidae and Hemigaleidae

**PRESENT FISHING GROUNDS:**

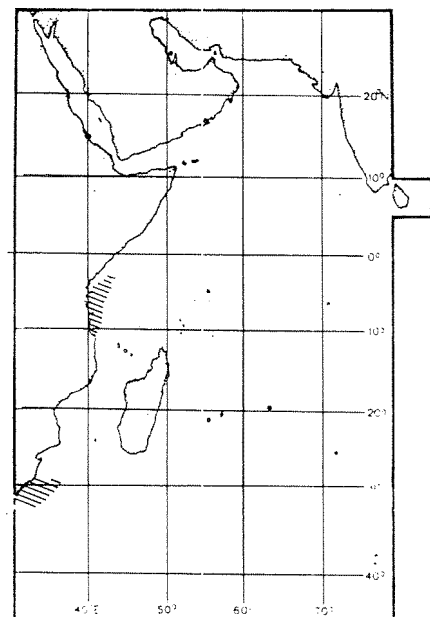
Offshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls and on hook and line.

An uncommon species apparently little-utilized in the area.



FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIAKIDAE

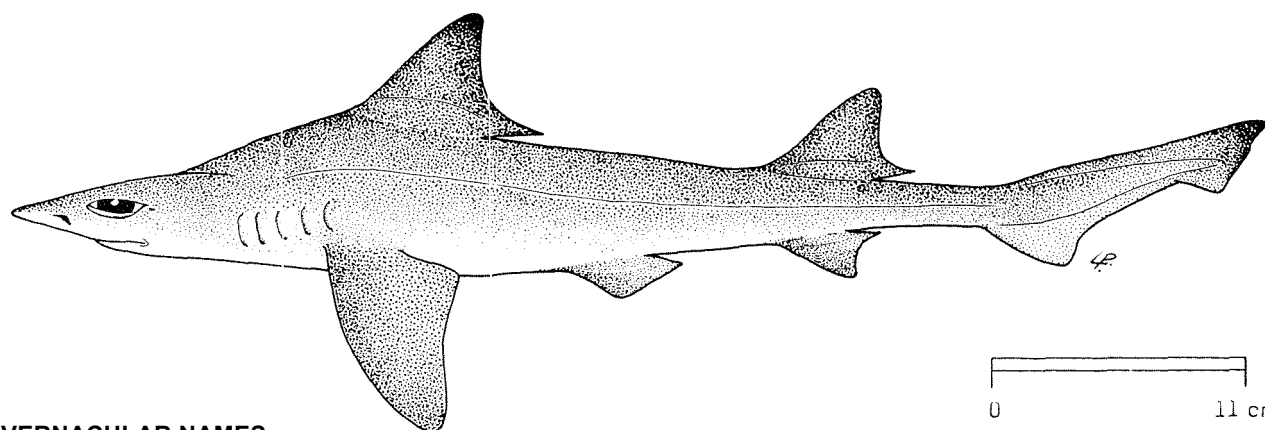
FISHING AREA 51  
(W. Indian Ocean)

*lago omanensis* (Norman, 1939)

OTHER SCIENTIFIC NAMES STILL IN USE:

*Galeorhinus omanensis* (Norman, 1939)

*Eugaleus omanensis* Norman, 1939



VERNACULAR NAMES:

FAO: En Bigeye houndshark  
Fr - Requin-hâ à gros yeux  
Sp - Cazón ojigrande

NATIONAL:



DISTINCTIVE CHARACTERS:

A small, rather slender shark with a stout, humpbacked trunk. Head flattened above and below, snout moderately long and narrowly rounded; nostrils with small nasal flaps, not formed as barbels or greatly expanded, without nasoral grooves; 5 gill slits, moderately long and wide-spaced, the last two above pectoral fin bases; eyes horizontally oval on sides of head, with well-differentiated nictitating lower eyelids partially inside the eye openings; spiracles small; mouth angular, with moderate-sized labial furrows that do not reach front of mouth; teeth small, alike in both jaws, compressed, bladelike; lateral teeth with short, oblique cusps but without cusplets. First dorsal fin on back close to pectoral fins, with its origin over rear ends of pectoral fin bases; second dorsal fin slightly smaller than first dorsal and over twice as large as anal fin, its origin anterior to origin of latter; caudal fin with lower lobe hardly indicated, terminal lobe moderately long and about 1/3 as long as upper edge of fin. Interdorsal ridge absent; caudal peduncle without keels or precaudal pits. Denticles on sides narrow, with a strong medial cusp and weak side cusps.

Colour: grey-brown above, white or lighter below; dorsal fins and caudal upper lobe often black-tipped.



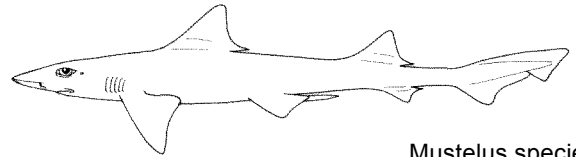
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

lago species: an apparently undescribed species of lago occurs in the Arabian Sea south to southern India along with I. omanensis. but differs in its shorter head and very low pectoral and dorsal fins.

Other species of Triakidae in the area have the origin of the first dorsal fin more posterior, over or behind the pectoral inner margins; also teeth either molariform and not bladelike, or, if bladelike, with well-developed cusplets.



lago species



Mustelus species

## SIZE:

Maximum: about 58 cm, adult males (at 30 or 36 cm) markedly smaller than females (at 40 to 58 cm).

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Confined to the area, from the Red Sea and the Gulf of Oman to Pakistan and southern India.

A small, deepwater shark found on the continental shelf and slope at depths from 110 to possibly 2 200 m, but probably entering shallower water. Viviparous, with a yolk-sac placenta.

Feeds on small fishes and crustaceans.

## PRESENT FISHING GROUNDS:

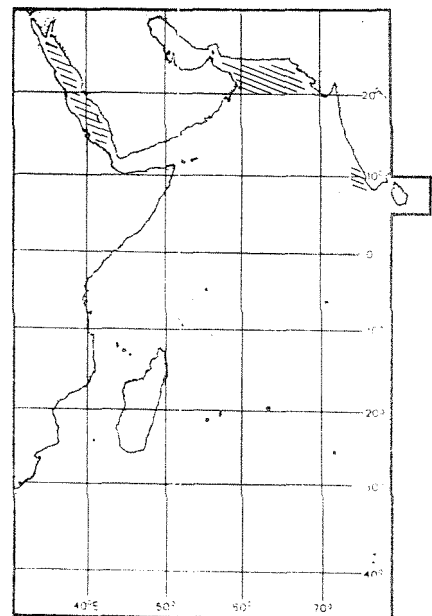
Offshore.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught in floating gillnets (India).

Utilized fresh for food, but of slight importance.



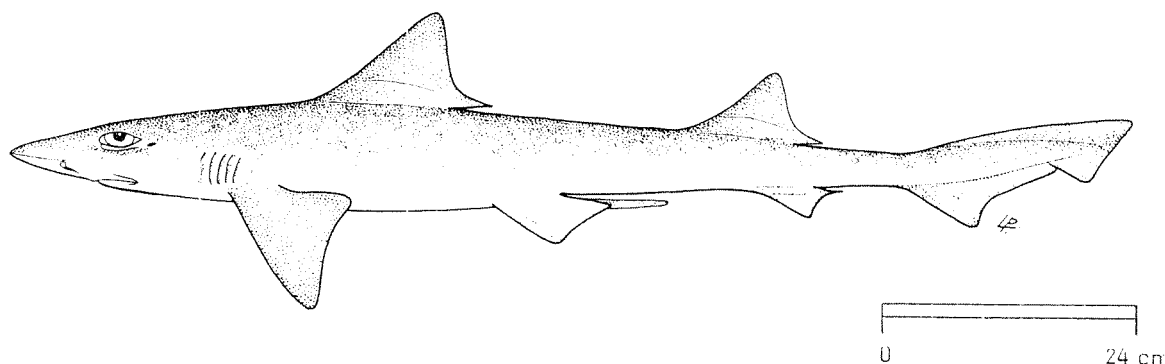
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIAKIDAE

FISHING AREA 51  
(W. Indian Ocean)

Mustelus manazo Bleeker, 1854

OTHER SCIENTIFIC NAMES STILL IN USE : Mustelus palumbes Smith, 1957



VERNACULAR NAMES:

FAO :           En - Starspotted smoothhound  
                  Fr - Emissole étoilée  
                  Sp - Musola palomba

NATIONAL:

DISTINCTIVE CHARACTERS:

A small shark. Body moderately elongated, head flattened above and below, snout relatively long and narrowly rounded, without hypercalcified rostrum; nostrils with long, broad nasal flaps that do not reach mouth; no nasoral grooves; 5 gill slits, the last 2 over pectoral fin bases; eyes horizontally oval, dorsolateral on head, with well-developed nictitatinq lower eyelids partially inside the eye openings; spiracles moderately large; mouth broadly angular; labial furrows moderately long, not reaching mouth, the uppers considerably longer than lowers; teeth small, alike in both jaws, blunt-crowned, not bladelike, without cusplets and with low cusps only in young. First dorsal fin on back between pectoral and pelvic fin bases, its origin over pectoral inner margins; second dorsal fin almost as large as first dorsal, and much larger than anal fin, its origin well in front of anal fin; caudal fin with lower lobe short in adults and hardly developed in young. An interdorsal ridge present; caudal peduncle without keels or precaudal pits. Valvular intestine with a spiral valve.

Colour: back and sides grey or grey-brown, underside cream-white; a series of small white spots on sides.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Mustelus mosis: very similar to Mustelus manazo, and often mistaken for it, but differing in having its upper labial furrows about as long as, or slightly longer than the lower furrows, no white spots on sides, and rostrum and other structures strongly hypercalcified (the hypercalcified rostrum can be easily examined by pinching the snout or cutting into it).

Scylliogaleus queckettii: snout shorter, bluntly rounded; mouth broadly arcuate; anterior nasal flaps greatly expanded reaching mouth, and covering broad nasoral grooves.

Other superficially similar sharks: teeth not blunt, molariform and arranged in a pavement.



underside of head

**SIZE:**

Maximum: at least 120 cm in the area, smaller elsewhere.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

In the area, definitely known from off South Africa arid southern Mozambique, but nominally recorded from virtually the entire area; records from the Red Sea eastward to southern India are apparently based on M. mosis as far as is known, although it is possible that M. manazo also occurs in this part of the area. Elsewhere, off Namibia and the Cape arid west coast of South Africa, arid the Western Pacific from southern Siberia, Korea, Japan, China, Taiwan alarid and Vietnam.

A small, bottom-living shark found in continental waters, ranging in depth from the intertidal zone to at least 360 m depth. Ovoviviparous, without a yolk-sac placenta; size at birth about 30 cm.

**PRESENT FISHING GROUNDS:**

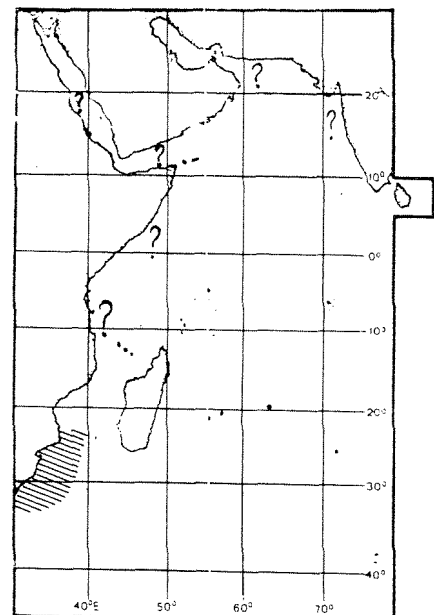
Primarily inshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls and on hook and line (sports catches).

Apparently little utilized in that part of the area where it is definitely known.



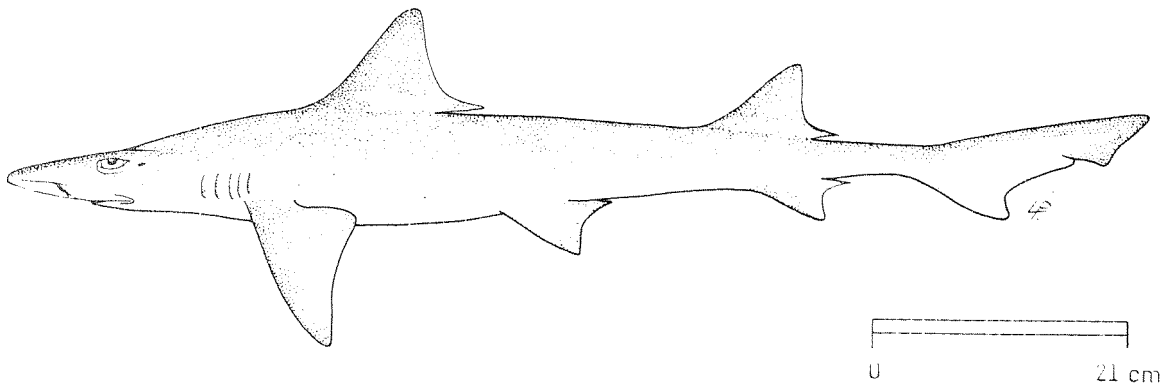
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIAKIDAE

FISHING AREA 51  
(W. Indian Ocean)

Mustelus mosis Hemprich & Ehrenberg, 1899

OTHER SCIENTIFIC NAMES STILL IN USE : Mustelus manazo Bleeker, 1854 (misidentified)



VERNACULAR NAMES:

FAO :           En - Arabian smoothhound  
                  Fr - Emissole d'Arabie  
                  Sp - Musola árábiga

NATIONAL:

DISTINCTIVE CHARACTERS:

A small shark. Body moderately elongated, head flattened above and below, snout relatively long and narrowly rounded, with a hypercalcified rostrum that can be felt by pinching the snout or can be readily dissected out; nostrils with long, broad nasal flaps that do not reach mouth; no nasoral grooves; 5 gill slits, the last 2 over the pectoral fin bases; eyes horizontally oval, dorsolateral on head, with well-developed nictitating lower eyelids partially inside the eye openings; spiracles moderately large; mouth broadly angular; labial furrows moderately long, not reaching mouth, the uppers about as long as, or slightly longer than lowers; teeth small, alike in both jaws, blunt-crowned, not bladelike, without cusplets and with low cusps only in young. First dorsal fin on back between pectoral and pelvic fin bases, its origin over pectoral inner margins; second dorsal fin almost as large as first dorsal, and much larger than anal fin, as origin well in front of anal fin; caudal fin with lower lobe short in adults and hardly developed in young. An interdorsal ridge present; caudal peduncle without keels or precaudal pits. Valvular intestine with a spiral valve.

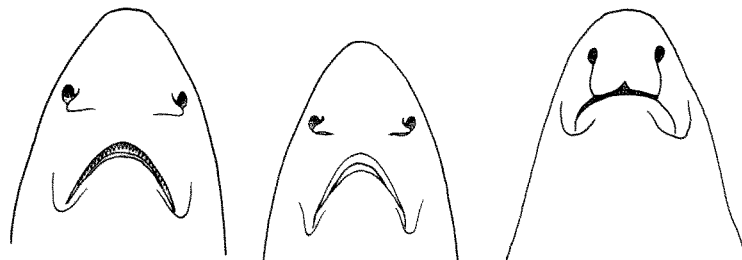
Colour: back and sides plain grey or grey-brown, underside cream-white; no spots on sides.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN AREA:**

Mustelus manazo: upper labial furrows conspicuously longer than lower; body usually with numerous small white spots; rostrum and other skeletal structures not hypercalcified.

Scylliogaleus guecketti: snout shorter, bluntly rounded, mouth broadly arcuate, anterior nasal flaps greatly expanded, reaching mouth and covering broad nasoral grooves.

Other superficially similar small sharks: teeth not blunt, molariform and arranged in pavement.



a) Mustelus manazo    b) *Mustelus mosis*    c) Scylliogaleus guecketti

underside of head

**SIZE:**

Maximum: about 106 cm; maturin at 63 to 80 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR :**

As currently known, confined to the northern part of the area, from the Red Sea, the "Gulf", Pakistan, west and southeast coast of India and Sri Lanka. It is not known if the species ranges further eastward into the eastern Indian Ocean.

A small bottom-living shark found in continental waters of the area. Viviparous, with a yolk-sak placenta, 6 to 10 young in a litter. Size at birth about 33 to 37 cm.

Probably feeds primarily on crustaceans.

**PRESENT FISHING GROUNDS :**

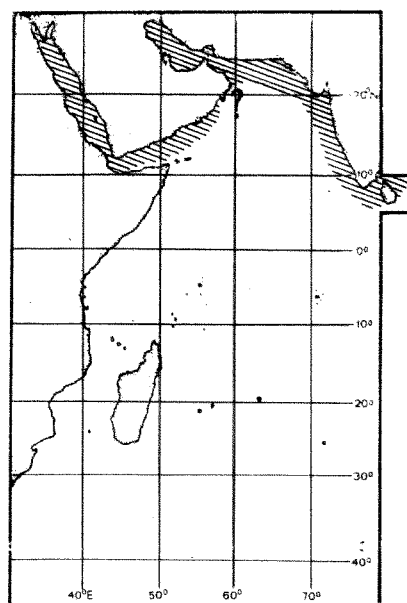
Off India, Sri Lanka and Pakistan, and probably also in the Red Sea, primarily inshore.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught in bottom trawls, fixed bottom and floating gillnets, and on line gear.

Utilized fresh for human consumption, probably also for fishmeal.



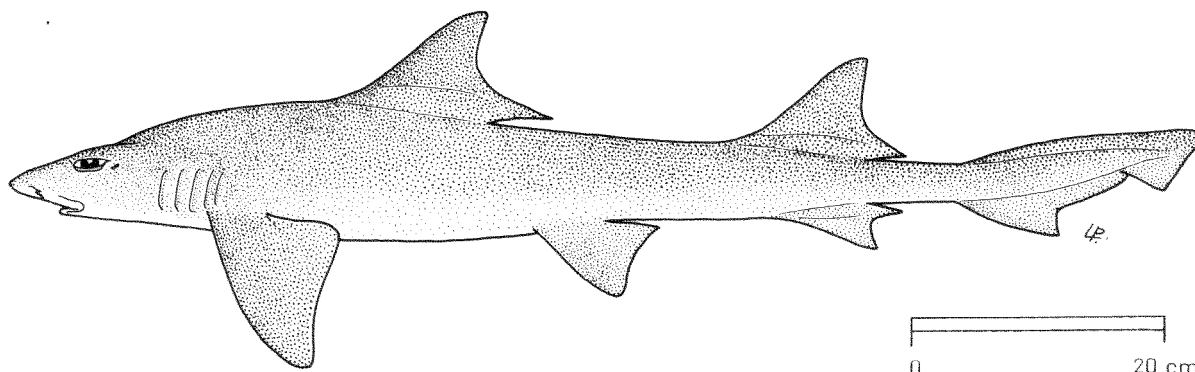
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: TRIAKIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Scylliogaleus queckettii* Boulenger, 1902

OTHER SCIENTIFIC NAMES STILL IN USE: None



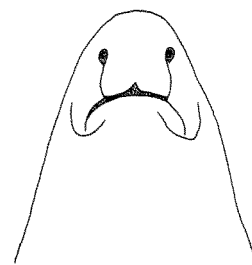
VERNACULAR NAMES:

FAO: En - Flapnose houndshark  
Fr - Virli à clapet  
Sp - Cazón mosqueador

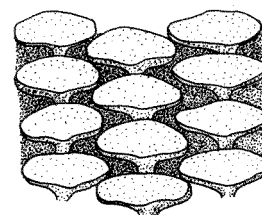
NATIONAL:

DISTINCTIVE CHARACTERS:

A small, moderately stout shark. Head flattened above and below, snout short and broadly rounded; nostrils with greatly enlarged nasal flaps, extending posteriorly to mouth and medially to meet each other at upper symphysis, and shallow nasoral grooves; 5 gill slits, the last 2 above pectoral fin bases; eyes horizontally oval, dorsolateral on head, with well-differentiated nictitating lower eyelids almost entirely inside the eye openings; spiracles small; mouth short and broadly rounded, with long labial grooves that reach front of mouth; teeth small, alike in both jaws, blunt, molariform, without cusps, arranged in a pavement. First dorsal fin on back, with its origin over pectoral inner margins or free rear tips and its base about equidistant between pectoral and pelvic fin bases; second dorsal fin about as large as first, over twice the size of anal fin, with its origin anterior to anal fin origin; caudal fin with a short ventral lobe in adults (poorly developed in young) and a moderately long terminal lobe about 1/3 as long as upper edge of fin. Interdorsal ridge absent; caudal peduncle without keels or precaudal pits. Denticles on sides strongly cuspidate.



underside of head



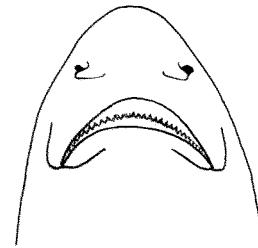
teeth

Colour: grey above, cream below, no prominent markings.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Triakis megalopterus: found just southwest of the area, on the Cape and west coast of South Africa, resembling S. queketti in its short, blunt snout, broadly arched mouth, and long labial furrows that reach the level of the upper jaw, but differs in having its nasal flaps not greatly expanded, no nasoral grooves, teeth cuspidate, fins larger, and often numerous dark spots on the back.

Other species of Triakidae: nasal flaps not greatly expanded, no nasoral grooves.



underside of head

## SIZE:

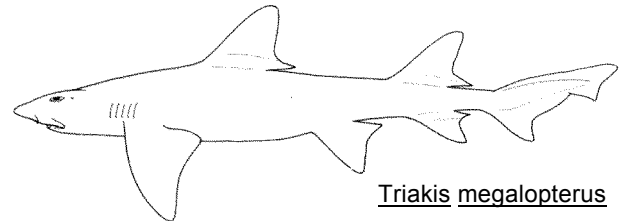
Maximum: about 102 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Virtually confined to the area, off South Africa.

An inshore, bottom-dwelling shark. Often found at the surfline. Possibly viviparous, with a yolk-sac placenta, number of fetuses in a litter 2 to 4; size at birth 35 cm.

Feeds primarily on crustaceans, including lobsters.



Triakis megalopterus

## PRESENT FISHING GROUNDS:

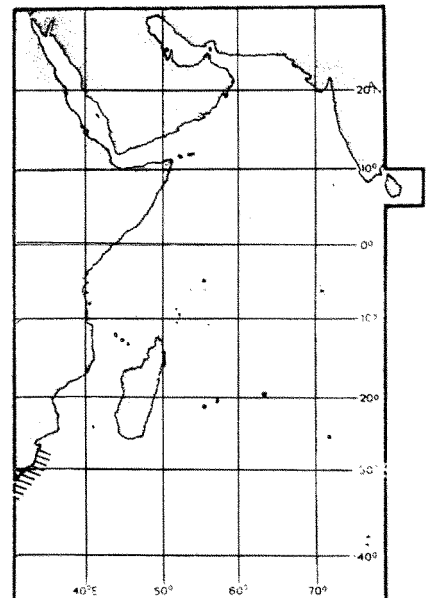
Inshore.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Primarily caught inshore on hook and line, probably also trawled.

Moderately common but little utilized where it occurs.



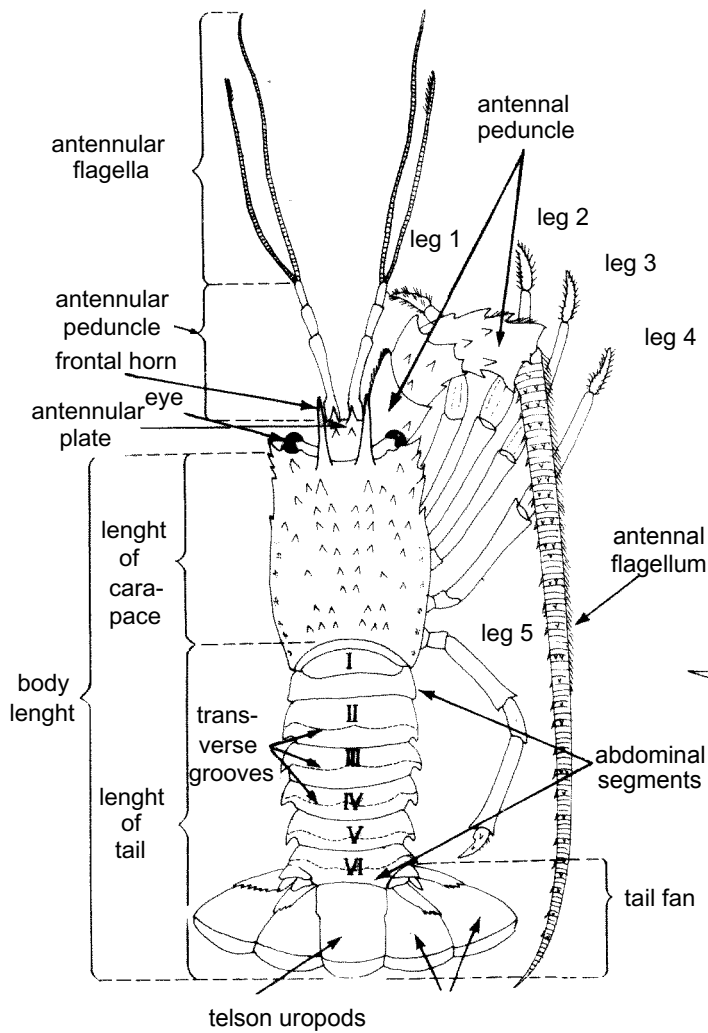
# LOBSTERS

[click for previous page](#)

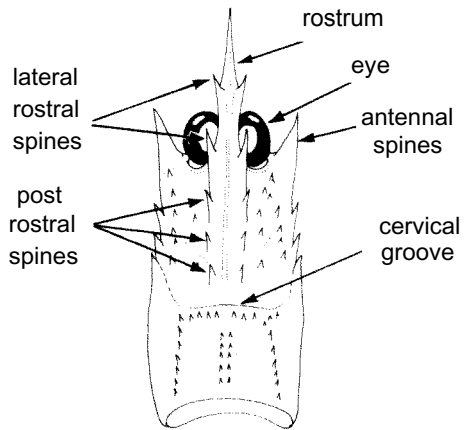


# LOBSTERS

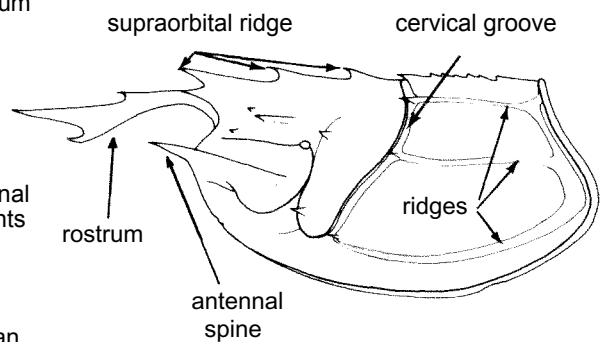
## TECHNICAL TERMS AND PRINCIPAL MEASUREMENTS USED



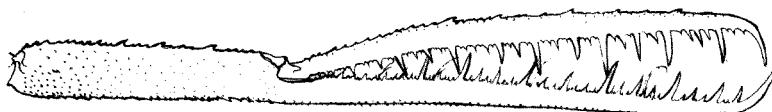
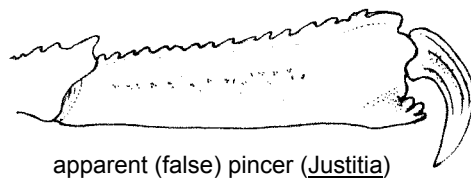
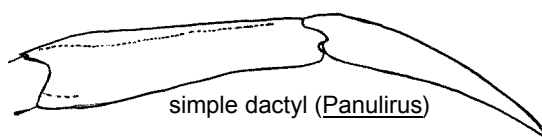
general shape (dorsal view) of a spiny lobster (*Panulirus* sp.) (no rostrum, no pincers)



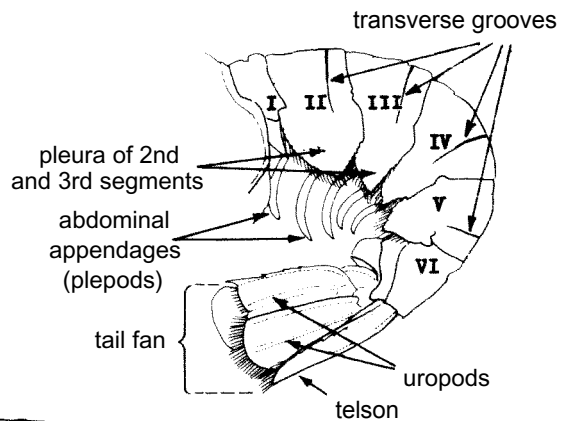
carapace (dorsal view) of a lobsterette (*Metarippeps* sp.)



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



Types of terminal segments of legs in first pair



tail (abdomen) in lateral view segments numbered I to VI

**GENERAL REMARKS**

The lobsters include a variety of crustaceans ranging in size (measured from the tip of the rostrum to the end of the tail, thus excluding any of the appendages) from a few to more than 60 cm. They are more or less elongate animals with cylindrical or flattened bodies and a prominent tail or abdomen consisting of 6 movable segments and a terminal fan. The tail is usually about as long as the rigid and often spiny or tuberculate head or carapace. The eyes are stalked and usually movable in the sockets of the carapace, but reduced or unpigmented in some families (e.g., the deep-sea Polychelidae). The most conspicuous of the appendages of the anterior part of the body, situated before and below the carapace, are a pair of usually small, slender antennules, a pair of more robust antennae (long, simple, and cylindrical in most families, scale-like in the slipper-lobsters or Scyllaridae) and 5 pairs of legs (pereiopods, thoracic legs or walking legs). The first pair of legs is enlarged in certain families (Nephropidae, Polychelidae), in others it differs hardly at all from the following legs (Palinuridae, Scyllaridae). The legs may all end in a simple curved dactyl (e.g., in Palinuridae and Scyllaridae) or some of them may terminate in true pincers or chelae (i.e., the first three pairs in Nephropidae, 4 or 5 pairs in Polychelidae, and the last pair in females of Palinuridae and Scyllaridae). The abdominal appendages are short and biramous, leaf-like supple abdominal legs or pleopods.

In the Western Indian Ocean, the lobsters are represented by 5 families and about 47 species, of which only relatively few can be considered of interest to fisheries at the present time. Most spiny and slipper lobsters (Palinuridae and Scyllaridae, respectively), as well as the Synaxidae usually occur in fairly shallow waters, often on a rocky bottom or a bottom with coarse sediment. Most Nephropidae, a few Palinuridae and Scyllaridae, as well as the Polychelidae are found in deeper water on a muddy bottom.

Shallow-water species like those of the genus Panulirus and several of the family Scyllaridae are actively fished because of their large size and high market value; but most of the lobster fisheries in the Western Indian Ocean are only of moderate importance, the total annual catches from the area averaging about 2 000 tons between 1978 and 1981. Exploratory fishing indicates that some of the deeper-water species may eventually prove to be of commercial interest.

Most of the lobsters are caught with lobster pots, some are taken in fishing nets, and many are speared during night fishing in quite shallow water, or taken by skin divers in slightly deeper waters. A few species are being exported canned or frozen, but most are consumed locally.

**GUIDE TO FAMILIES OCCURRING IN THE AREA**

NEPH

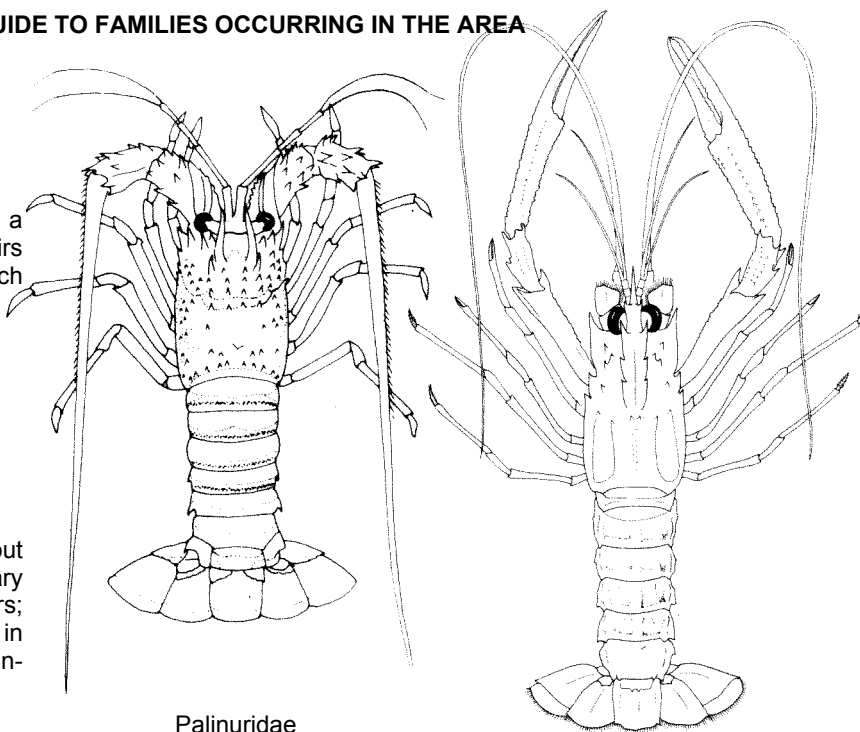
NEPHROPIDAE: True lobsters and lobsterettes

Body tubular; carapace with a well developed rostrum; first 3 pairs of legs with pincers, first pair much larger than others; antennae cylindrical, longer than body.

PALIN

PALINURIDAE: Spiny lobsters

Body tubular; carapace without a rostrum or with a very rudimentary one. Legs without true pincers; first pair not enlarged (except in Justitia). Antennae enlarged, cylindrical, longer than body.



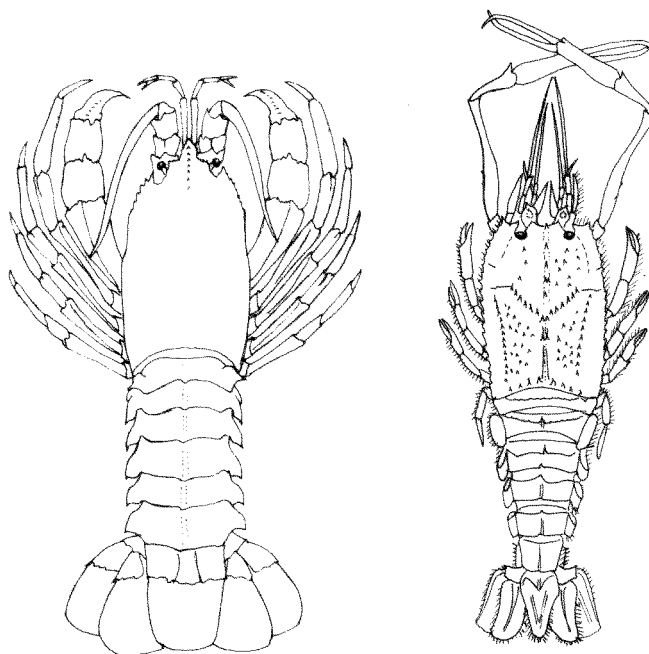
Palinuridae

Nephropidae

SYNTAX

SYNTAXIDAE: Furry lobsters

Body tubular, hairy, without enlarged spines; carapace with a small rostrum; legs without pincers, first pair much larger than others; antennae cylindrical, shorter than body. A single species in the area, Palinurellus wieneckii (bright orange).



Synaxidae

Polychelidae

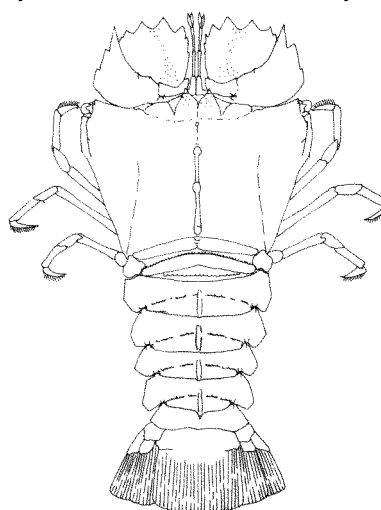
POLYCHELIDAE

Eyes small and lacking pigment; soft-bodied deep-sea lobsters; carapace without a rostrum, or rostrum rudimentary; telson of tail-fan pointed; first 4 or all legs with pincers, first pair enlarged; antennae cylindrical, shorter than body. No species of interest to fisheries in Fishing Area 51.

SCYLL

SCYLLARIDAE: Slipper lobsters

Body strongly flattened dorsoventrally; carapace without a rostrum; legs without pincers, none of them enlarged; antennae scale-like.



Scyllaridae

LIST OF SPECIES OCCURRING IN THE AREA

Code numbers are given for those species for which Identification Sheets are included

NEPHROPIDAE

Acanthacaris tenuimana Bate, 1888

NEPH Acant 2

Metanephrops andamanicus (Wood-Mason, 1892)

NEPH Metan 2

Nephropsis ensirostris Alcock, 1901

Nephropsis malhaensis Borradaile, 1910

Nephropsis stewarti Wood-Mason, 1873

NEPH Nephps 3

Nephropsis suhmi Bate, 1888

Thymopides grobovi (Burukovsky & Averin, 1976)

FAO Sheets

LOBSTERS

Fishing Area 51

PALINURIDAE

<u>Jasus paulensis</u> (Heller, 1862)	PALIN Jas 1	
<u>Justitia japonica</u> (Kubo, 1955)		
<u>Justitia longimanus mauritania</u> (Miers, 1882)	PALIN Just 1	
<u>Linuparus somniosus</u> Berry & George, 1972	PALIN Lin 1	
<u>Palinurus delagoae</u> Barnard, 1926	PALIN Palin 4	
<u>Palinustus mossambicus</u> Barnard, 1926		
<u>Palinustus unicornutus</u> Berry, 1979		
<u>Panulirus homarus homarus</u> (Linnaeus, 1758)	}	PALIN Panul 6
<u>Panulirus homarus megasculptus</u> (Pesta, 1915)		
<u>Panulirus homarus rubellus</u> Berry, 1974		
<u>Panulirus longipes longices</u> (A. Milne Edwards, 1868)	PALIN Panul 7	
<u>Panulirus ornatus</u> (Fabricius, 1798)	PALIN Panul 8	
<u>Panulirus penicillatus</u> (Olivier, 1791)	PALIN Panul 9	
<u>Panulirus polyphagus</u> (Herbst, 1793)	PALIN Panul 10	
<u>Panulirus versicolor</u> (Latreille, 1804)	PALIN Panul 11	
<u>Projasus parkeri</u> (Stebbing, 1902)		
<u>Puerulus angulatus</u> (Bate, 1888)		
<u>Puerulus carinatus</u> Borradaile, 1910		
<u>Puerulus sewelli</u> Ramadan, 1938	PALIN Puer 1	

SYNTAXIDAE

<u>Palinurellus wieneckii</u> (De Man, 1881)	SYNTAX Pali 2
--	---------------

SCYLLARIDAE

<u>Arctides regalis</u> Holthuis, 1963	
<u>Ibacus novemdentatus</u> Gibbes, 1850	SCYLL Ib 1
<u>Parribacus antarcticus</u> (Lund, 1793)	SCYLL Par 1
<u>Scyllarides elisabethae</u> (Ortmann, 1894)	SCYLL Scyld 5
<u>Scyllarides squamosus</u> (H. Milne Edwards, 1837)	SCYLL Scyld 6
<u>Scyllarides tridacnophaga</u> Holthuis, 1967	
<u>Scyllarus batei</u> Holthuis, 1946	SCYLL Scylr 2
<u>Scyllarus cultrifer meridionalis</u> Holthuis, 1960	
<u>Scyllarus gibberosus</u> (De Man, 1905)	
<u>Scyllarus lewinsohni</u> Holthuis, 1967	
<u>Scyllarus martensii</u> Pfeffer, 1881	
<u>Scyllarus ornatus</u> Holthuis, 1960	
<u>Scyllarus pumilus</u> Nobili, 1905	
<u>Scyllarus rubens</u> Alcock & Anderson, 1894	
<u>Scyllarus rugosus</u> H. Milne Edwards, 1837	
<u>Scyllarus sordidus</u> (Stimpson, 1860)	
<u>Thenus orientalis</u> (Lund, 1793)	SCYLL Then 1

POLYCHELIDAE

<u>Stereomastis andamanensis</u> (Alcock, 1894)
<u>Stereomastis phosphorus</u> (Alcock, 1894)
<u>Stereomastis sculpta</u> (S.I. Smith, 1880)
<u>Polycheles beaumontii</u> (Alcock, 1894)
<u>Polycheles gibbus</u> Alcock, 1894)
<u>Polycheles hextii</u> (Alcock, 1894)

## FAO SPECIES IDENTIFICATION SHEETS

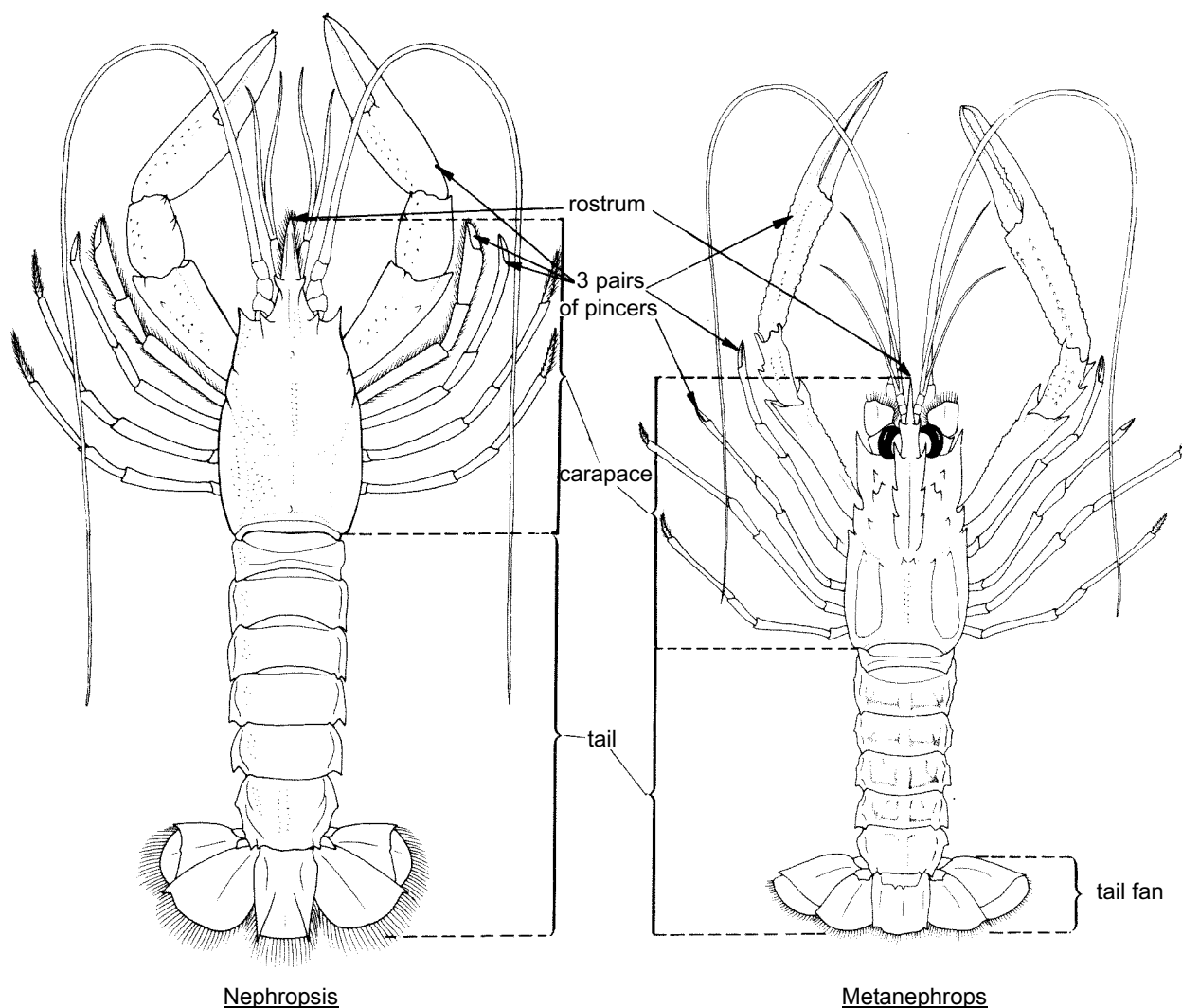
FISHING AREA 51  
(W. Indian Ocean)

## NEPHROPIDAE

True lobsters and lobsterettes

Moderate- to large-sized crustaceans. Carapace (or "head") cylindrical, with a well developed, median rostrum and variously ornamented with spines or nodules, occasionally smooth; eyes movable, usually well developed and with black pigment, but small and lacking pigment, or even absent, in some deep-water forms. Antennae long and whip-like, antennules slender, ending in 2 long flagella. Tail powerful, with a well developed fan, abdominal segments smooth, or with one or more transverse grooves, or spiny, or granulate. First 3 pairs of walking legs ending in true pincers, the first pair, and especially its pincers, usually enlarged.

Colour: variable, depending on the species; some drab, others marked with pink or red. Deep-sea forms are whitish or pinkish.



examples of basic types of true lobsters

This family comprises seven species in Fishing Area 51 ranging in size from 4 to over 25 cm, and occurring in depths ranging from slightly less than 300 to over 2 000 m. All lobsters and lobsterettes are bottom-dwelling species, usually preferring muddy or sandy bottoms; of some species it is known that they make burrows in the substrate. The only species of some commercial importance at this time in the Western Indian Ocean is the Andaman lobster, Metanephrops andamanicus. Other species, likewise from deeper waters, caught in, exploratory trawling cruises, might possibly have some potential when fishing operations extend further into deeper water and they are here described on individual sheets to facilitate their identification.

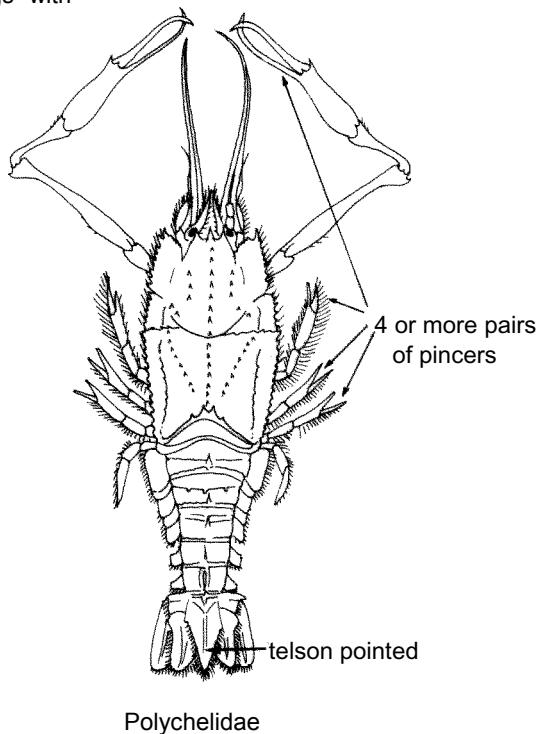
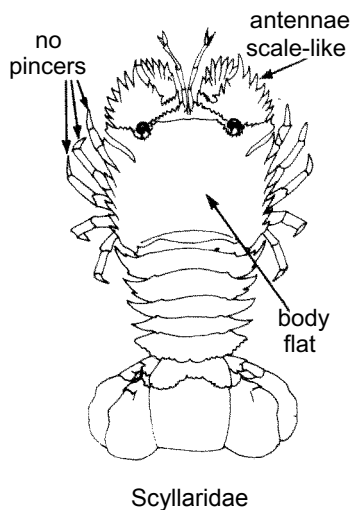
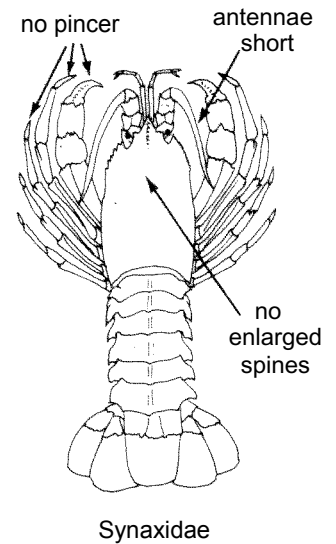
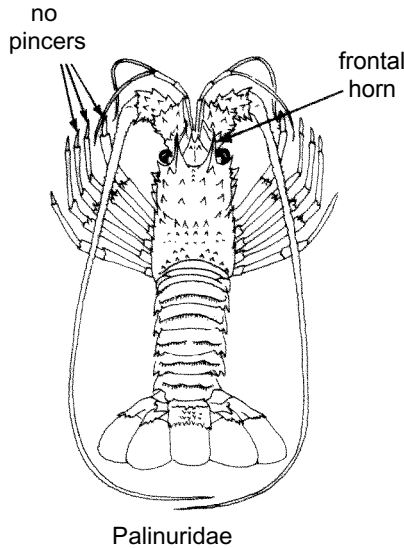
**SIMILAR FAMILIES OCCURRING IN THE AREA :**

Palinuridae: carapace without a median rostrum (or with rostrum reduced to a short single spine), but with frontal horns over the eyes; first 4 walking legs without pincers, first pair not greatly enlarged, except in males of Justitia.

Synaxidae (Palinurellus wieneckii): carapace covered with small, rounded nodules, but without enlarged spines; antennae short; walking legs without pincers; entire body hairy and bright orange or red.

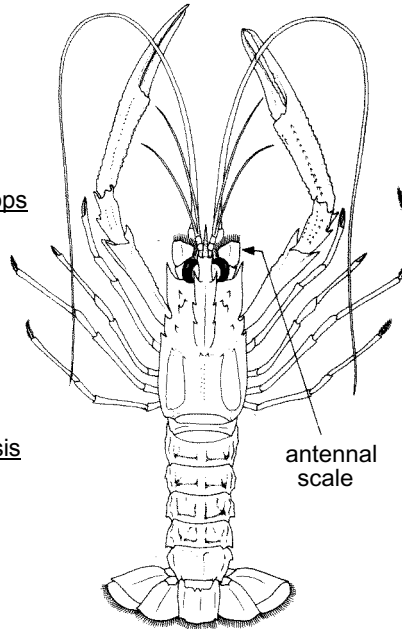
Scyllaridae: body strongly flattened; rostrum rudimentary or absent; no enlarged pincers: antennae scale-like.

Polychelidae (no species of interest to fisheries in Fishing Area 51). blind, deep-sea lobsters with a very soft body; rostrum rudimentary or absent; 4 or 5 pairs of legs with pincers; telson pointed.

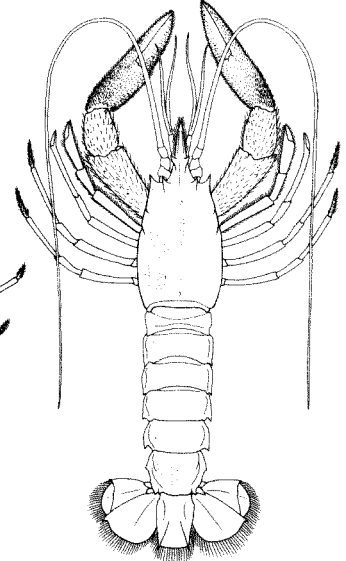


**KEY TO GENERA OCCURRING IN THE AREA:**

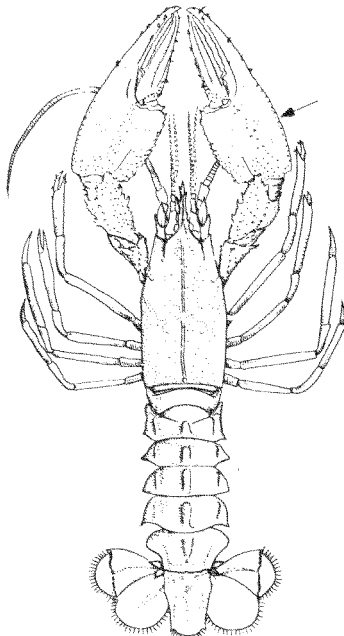
- 1a. Eyes large with black pigment; antennal scale present (Fig.1); body not uniformly spinulose ..... Metanephrops
- 1b. Eyes small, reduced, without pigment
  - 2a. Antennal scale absent; abdomen without a distinct median ridge; pincers with soft pubescence (Fig.2); body not uniformly spinulose..... Nephropsis
  - 2b. Antennal scale present; pincers without soft pubescence (Figs 3,4)
    - 3a. Pincers of first pair of legs very long and narrow, more than 10 times as long as wide; abdomen without median ridge; body uniformly spinulose or nearly so (Fig.3)...Acanthacaris
    - 3b. Pincers of first pair of legs broad and heavy, less than 3 times as long as wide; abdomen with a blunt median longitudinal ridge (Fig.4); body not uniformly spinulose..... Thymopides



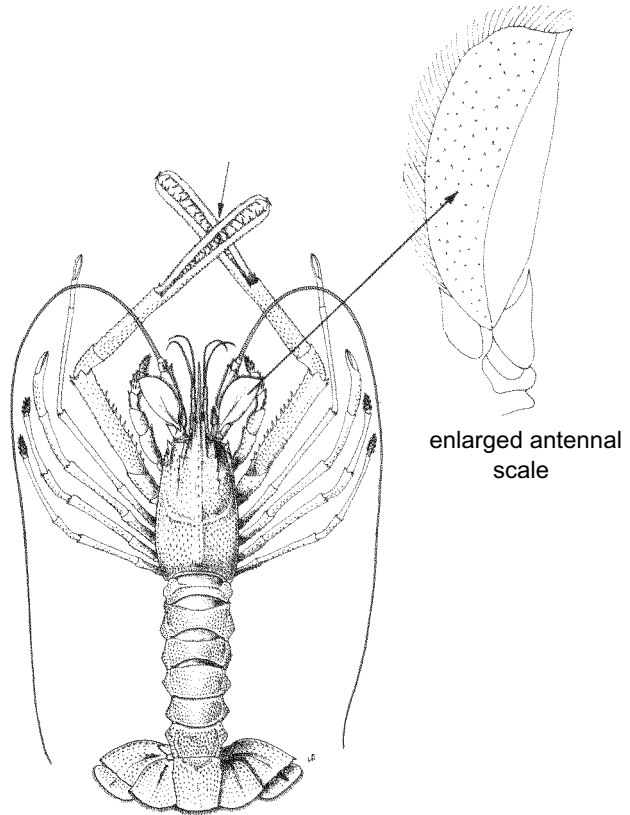
Metanephrops Fig.1



Nephropsis Fig.2



Thymopides Fig.4



Acanthacaris Fig.3

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Acanthacaris tenuimana Bate, 1888 NEPH Acant 2

Metanephrops andamanicus (Wood-Mason, 1892) NEPH Metan 2

Nephropsis ensirostris Alcock, 1901

Nephropsis malhaensis Borradaile, 1910

Nephropsis stewarti Wood-Mason, 1873 NEPH Nephps 3

Nephropsis suhmi Bate, 1888

Thymopides grobovi (Burukovsky & Averin, 1976)

Prepared by L.B. Holthuis, Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands. Family sheet partly based on Species Identification Sheets for the Western Central Atlantic (Fishing Area 31), prepared by R.B. Manning, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: NEPHROPIDAE

FISHING AREA 51  
(W. Indian Ocean)Acanthacaris tenuimana Bate, 1888

## OTHER SCIENTIFIC NAMES STILL IN USE:

Phoberus tenuimanus Bate, .1888Phoberus coecus sublevis Wood-Mason & Alcock, 1891Acanthacaris opipara Burukovsky & Musij, 1976

## VERNACULAR NAMES:

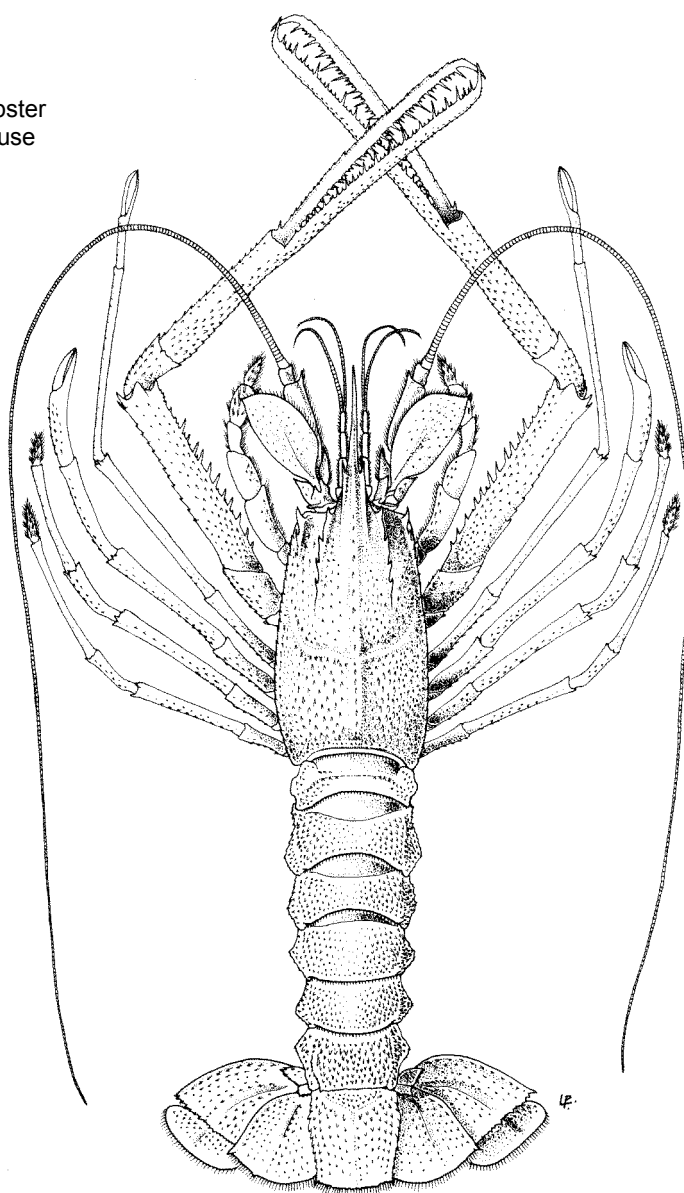
FAO : En - Prickly deep-sea lobster  
Fr - Langoustine spinuleuse  
SO - Cigala raspa

NATIONAL:

## DISTINCTIVE CHARACTERS:

A rather large lobster. Body cylindrical; completely covered with small spines and sharp tubercles; carapace with a well developed median rostrum. Eyes very small, lacking pigment; antennae long and whip-like; antennal scales well developed. Tail powerful, with a well developed fan. First 3 pairs of legs ending in true pincers; legs of the first pair equal, very slender, longer than body, covered with sharp spinules and ending in elongate and slender pincers (more than 10 times longer than high); the fingers 1.5 to twice as long as palm, elongate, with long teeth on cutting edges, but without hairs. Second pair of legs very much longer and less spiny than third pair.

Colour: uniform delicate pink



0 6 cm

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

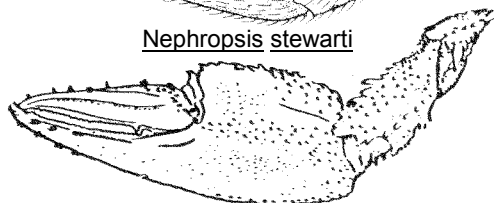
Nephropsis species: eyes also unpigmented, but size of animal much smaller (to about 12 cm), no antennal scales, and pincers shorter and heavier, with hairy fingers. Body not regularly covered with spinules.

Thymopides grobovi: eyes also unpigmented. Pincers of first pair less than 3 times as long as high (more than 10 times in A. tenuimana). Body not uniformly covered with spinules.

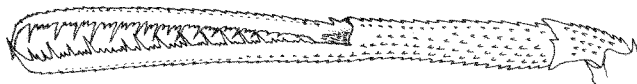
Metanephrops andamanicus: eyes large and v,ith black pigment; rostrum armed with lateral and ventral teeth only.



Nephropsis stewarti



Thymopides grobovi



Acanthacaris tenuimana  
pincer

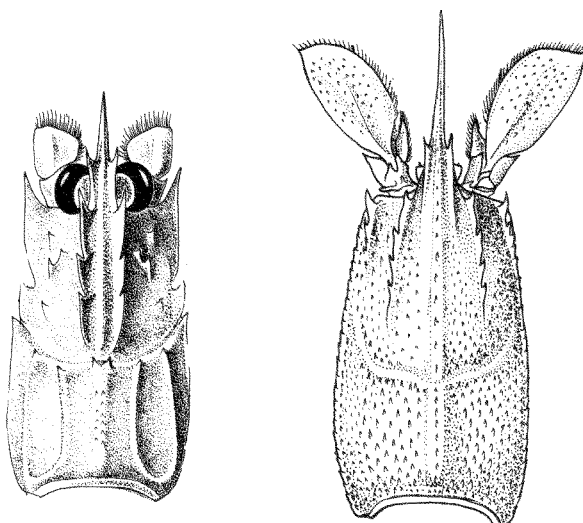
## SIZE:

Maximum: total body length about 26 cm; carapace length about 8 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, recorded from Natal (South Africa) and off the Laccadive Islands, off the west Coast of India. Outside the area, from the South China Sea and Indonesia. It is possible that the western form (from the Arabian Sea and Natal) is a species or subspecies distinct from the eastern form (South China Sea and Indonesia), in which case the western form should be referred to as Acanthacaris sublevis (Wood-Mason & Alcock, 1891) (or A. tenuimana sublevis) and the eastern form as Acanthacaris tenuimana tenuimana Bate, 1988.

A deep-water lobster which lives in burrows on soft, bottoms at depths between 850 and 1 670 m.



Metanephrops andamanicus

carapace

Acanthacaris tenuimana

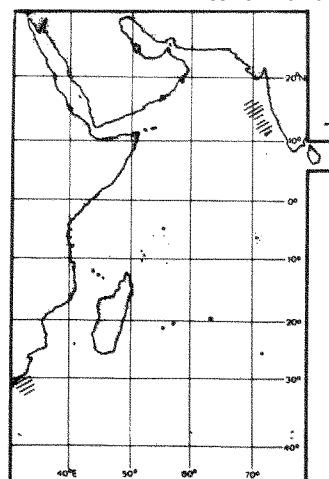
## PRESENT FISHING GROUNDS:

Not fished at present, taken incidental to deep trawling activities. Its Carribean counterpart (A. caeca (A. Milne Edwards)) has been caught in sizable quantities during explanatory deep-trawling operations with oversized bottom trawls. A similar possibility may exist for the present species in the Indian Ocean

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Taken by deep-sea trawls.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: NEPHROPIDAE

FISHING AREA 51  
(W. Indian Ocean)*Metanephrops andamanicus* (Wood-Mason, 1892)

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

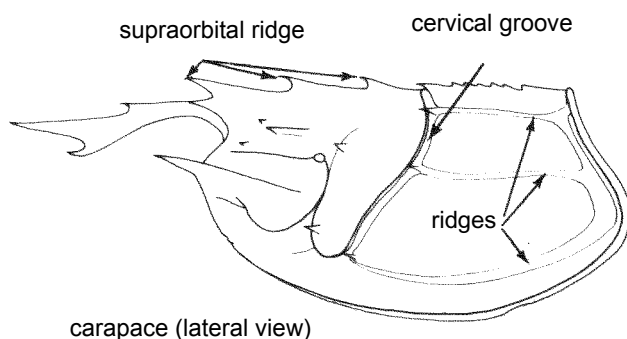
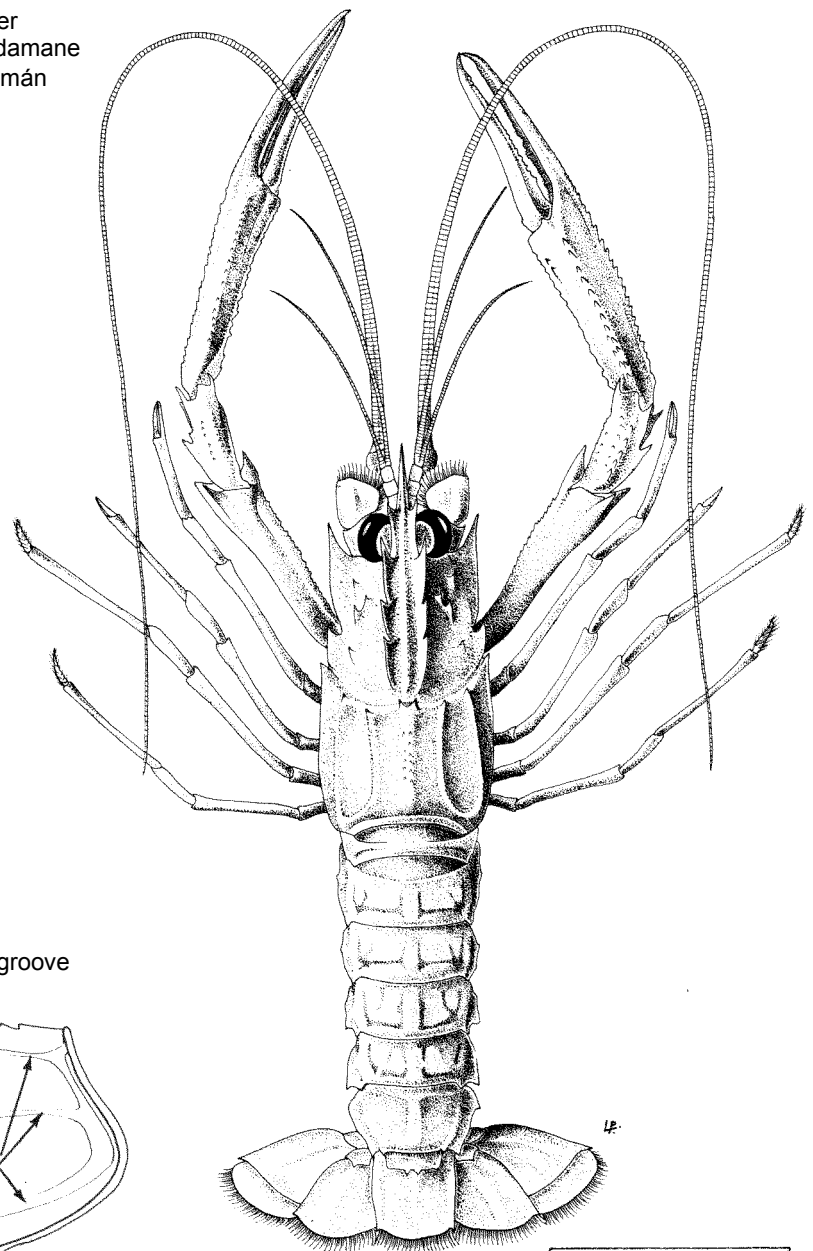
FAO :           En - Andaman lobster  
                  Fr - Langoustine andamane  
                  Sp - Cigala de Andamán

NATIONAL:

## DISTINCTIVE CHARACTERS:

A small to medium-sized lobster. Body cylindrical; carapace spiny, but not uniformly so, with a well developed median rostrum armed with lateral and ventral teeth only, and supra-orbital ridges extending behind eyes, the spaces between these ridges with a median ridge; longitudinal ridges present behind the cervical groove. Eyes well developed and pigmented; antennae long and whip-like; antennal scales present. Tail powerful, with a well developed fan and abdominal segments with a sculpturation of longitudinal and transverse grooves. First 3 pairs of legs ending in true pincers, the first pair very long and rather slender, square in cross section, with rows of spines along ridges.

Colour: pinkish; pincers banded with pink. Eggs dark blue.



carapace (lateral view)

0 5.4 cm

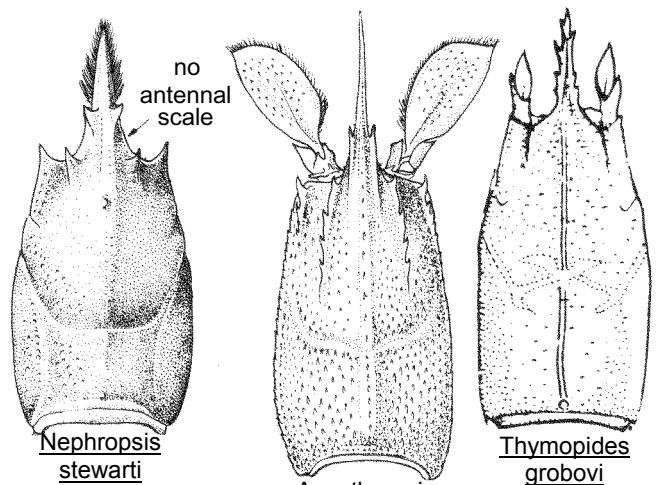
**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

All other species of Nephropidae: eyes reduced, without pigment.

Nephropsis species: antennal scales absent; p:era of abdommal segments triangular in side view; large pincers without ridges, pubescent.

Acanthacaris tenuimana: rostrum with mid-dorsal teeth. Body almost uniformly covered with spinules. Large pincer slender, more than 10 times as long as high; eyes very small, lacking pigment.

Thymopides robovi: carapace without post-rostral ridges, without spines. Pincers less than 3 times as long as high.



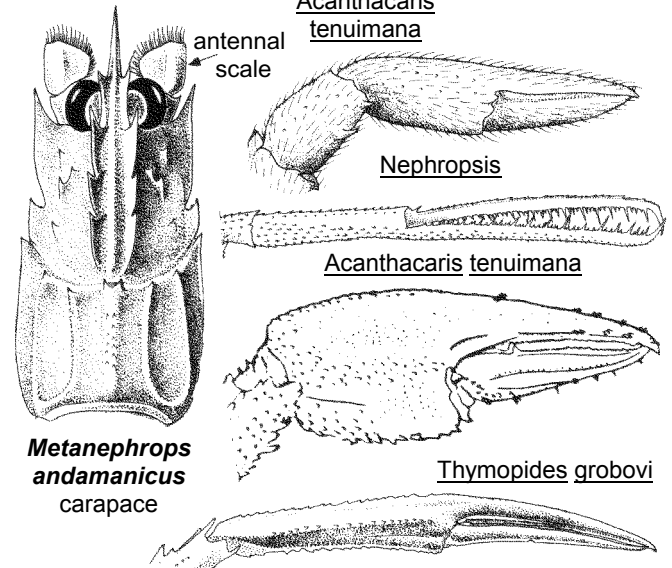
**SIZE:**

Maximum: carapace length 7 cm, total body length about 20 cm; common total body length about 15 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, known from east Africa (from Kenya to Natal and Madagascar). Elsewhere, from the Andaman Sea, Indonesia and southwest Australia.

It has been reported from depths between 200 and 750 m, but is found most commonly between 400 and 475 m. Lives on bottoms of hard mud, most likely in burrows.



**PRESENT FISHING GROUNDS:**

Not actively fished for at present, although of potential commercial interest. Occasionally taken in larger quantities by trawls. Crosnier & Jouannic (1973, Docum.sci.Centre Nosy-Bé ORSTOM, 42:13) report on catches made near Madagascar of 5 kg/h.

Metanephrops andamanicus carapace

Thymopides grobovi

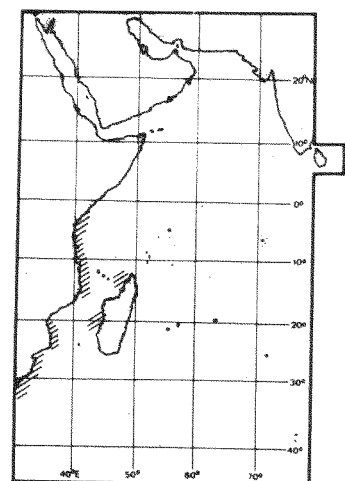
Metanephrops andamanicus pincer

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

The nominal annual catches in South African waters were reported to be 64 metric tons in 1975, 106 in 1976, 239 in 1977, 1135 in 1979 and 286 in 1980. No other statistics are available.

Taken by trawls.

Marketed mostly fresh.



FAO SPECIES IDENTIFICATION SHEETS

FAMILY: NEPHROPIDAE

FISHING AREA 51  
(W. Indian Ocean)

Nephropsis stewarti Wood-Mason, 1872

OTHER SCIENTIFIC NAMES STILL IN USE: None

VERNACULAR NAMES:

FAO : En - Indian Ocean lobsterette  
Fr - Langoustine indienne  
Sp - Cigala del Océano Indico

NATIONAL:

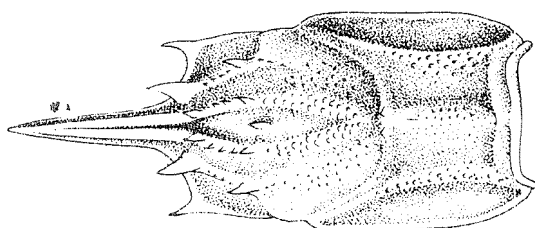
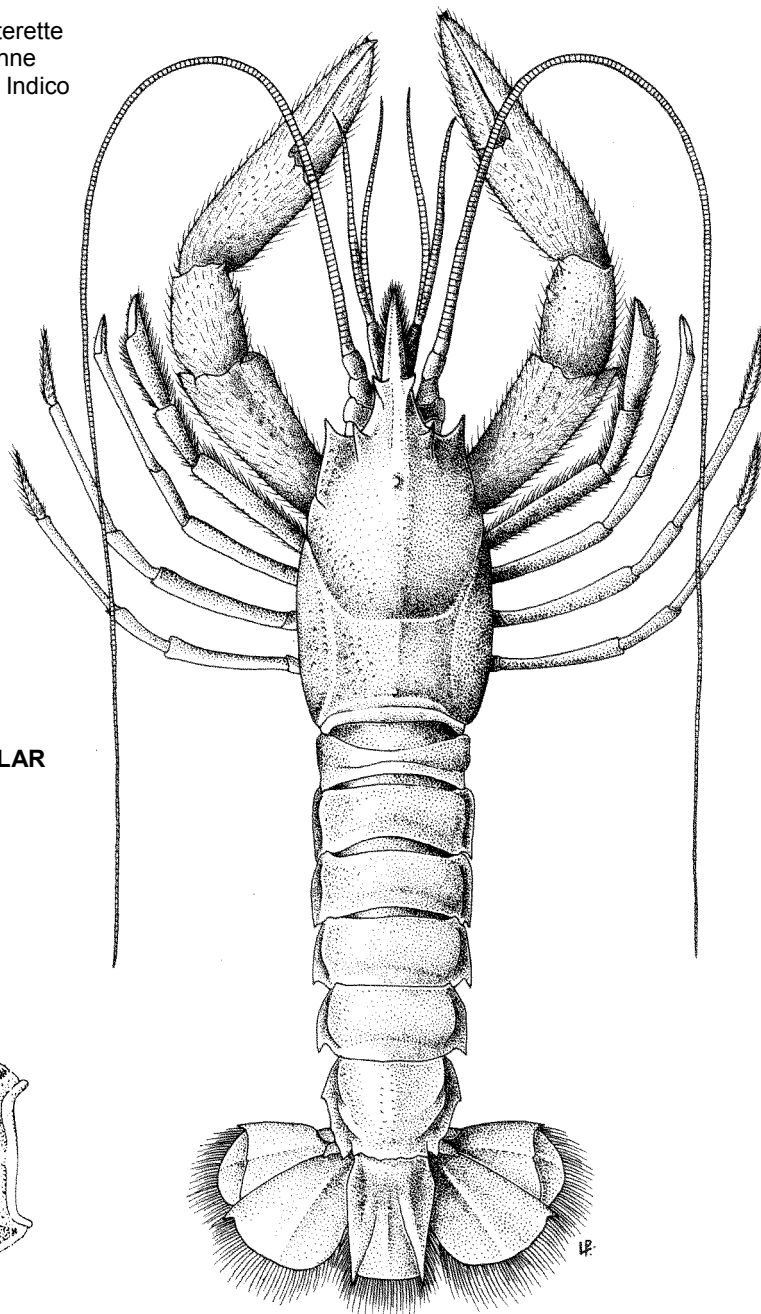
DISTINCTIVE CHARACTERS:

A small lobster. Body cylindrical, pubescent; carapace granular, with a well developed median rostrum armed with 1 pair of lateral spines; a single spine behind each eye. Eyes very small, lacking pigment; antennae long and whip-like; antennal scales absent. Tail powerful, without a dorsal ridge; with a well developed fan, the outer blade of which shows a transverse fissure; pleura (lateral projections) of second abdominal segment triangular, without spines on front edge. First 3 pairs of legs ending in true pincers, the first pair rather stout with short, very hairy (woolly) fingers.

Colour: generally pink or red, rather variable.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Nephropsis ensirostris: rostrum without lateral teeth. Several spines in median area of carapace behind post-orbital spines. Abdomen with a medio-dorsal ridge.



N. ensirostris  
carapace



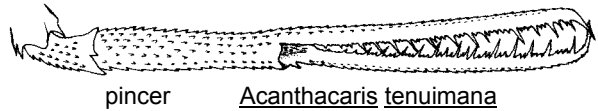
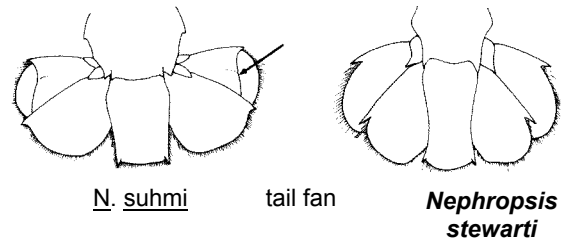
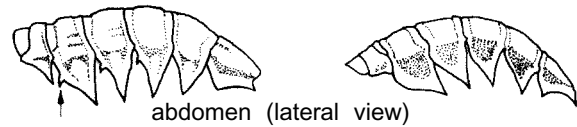
N. malhaensis: body not pubescent. Possibly synonymous with N. stewarti.

N. suhmi: rostrum with 2 lateral teeth. Anterior margin of second and following abdominal pleura with a spine or tooth. Outer blade of tail fan without a fissure.

Acanthacaris tenuimana: body larger, rather uniformly covered with spinules. Antennal scales present. Large pincers slender (more than 10 times as long as high).

Thymopides grobovi: rostrum with 2 or 3 lateral teeth; scaphocerite present; no postorbital spines; abdomen with a median ridge.

Metanephrops andamanicus: eyes large, pigmented.



**SIZE:**

Maximum: about 15 cm body length; common to 10 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, reported off East Africa (from the Gulf of Aden to Madagascar, Mozambique and Natal), and the Laccadive Islands, off the west coast of India. Outside the area, from the Bay of Bengal, Andaman Sea, Japan and Indonesia.

Occurs at depths between 350 and over 1 000 m, usually between 500 and 750 m. Found on soft bottoms of green or brown mud.

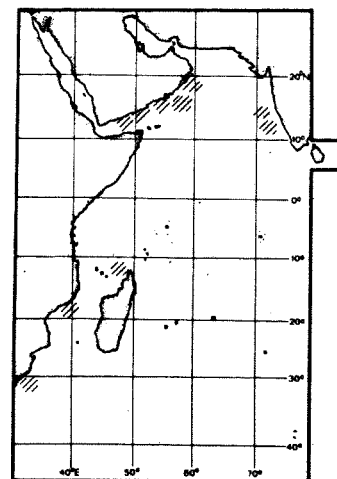
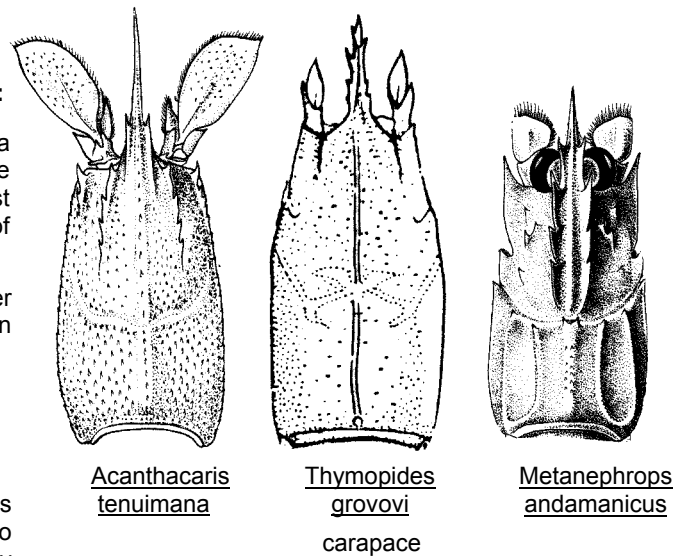
**PRESENT FISHING GROUNDS:**

Nowhere fished for commercially, but perhaps of future commercial interest. According to Crosnier & Jouannic (1973, Docum.sci.Centre Nosy Bé ORSTOM, 42:13) the species is caught in small quantities (1.2 kg/h, or less) and so far seems of little interest.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with bottom trawls.



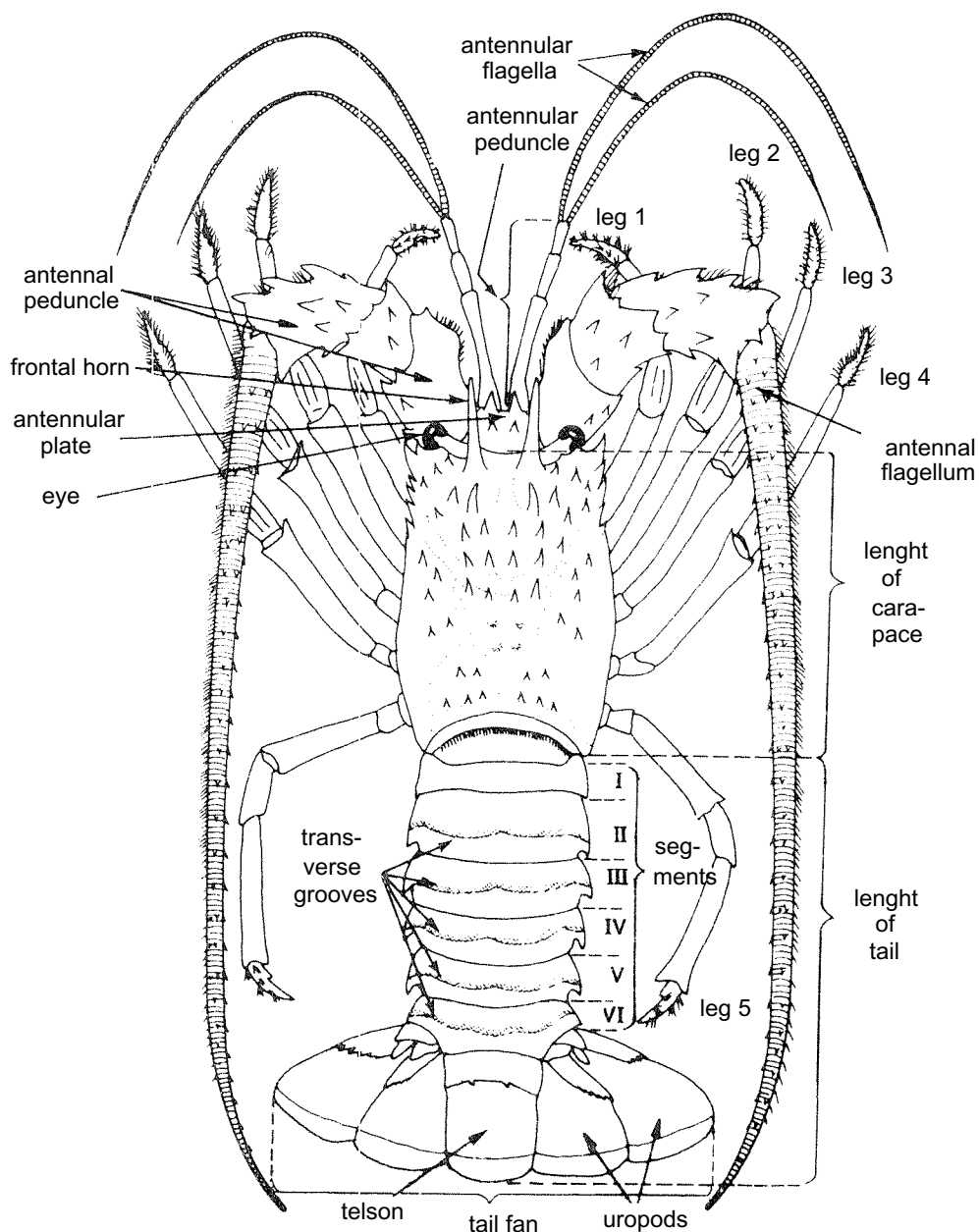
FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

PALINURIDAE

Spiny lobsters

Moderate- to large-sized crustaceans. Carapace (or "head") rounded in section (subcylindrical), without a distinct median rostrum, ornamented with spines and granules of various sizes, sometimes (*Justitia*) with a scale-like sculpturing; each eye protected by a strong, spiny frontal projection of the carapace (frontal horns). Antennae long and whip-like, antennules slender, each consisting of a segmented peduncle and 2 long or short flagella. In some genera, the bases of antennae are separated by a broad antennular plate usually bearing 1 or 2 pairs of spines, but spineless in some species; a projection from the base of each antenna forms with the rim of the antennular plate a stridulating organ, through which the animal by movement of the antenna can produce a grating sound. Tail powerful, with a well developed fan; abdominal segments either smooth or with one or more transverse grooves. Legs without true pincers or chelae (except the fifth pair of legs of the female, which ends in a very small pincer), the first pair usually not greatly enlarged (except in males of *Justitia*).





Colour: most species are brightly coloured and patterned with bands or spots, others uniform.

This family includes 18 Western Indian Ocean representatives (16 species, one with 3 subspecies), ranging in maximum body length from about 10 to 40 cm. Most are shallow-water forms (rarely extending beyond 100 m depth), living singly or in groups in coral reefs, rocky areas or other habitats that offer protection, although some species (of the genera Justitia, Linuparus and Puerulus) are more common in deeper water, down to over 300 m. The spiny lobster fishery in Fishing Area 51 is nowhere on a large scale. All species are primarily caught with traps, but most are also taken by hand or by spearing; a few can be trawled. The annual catches of spiny lobsters reported from Fishing Area 51 from 1978 to 1981 varied from 1 460 to 2 615 metric tons.

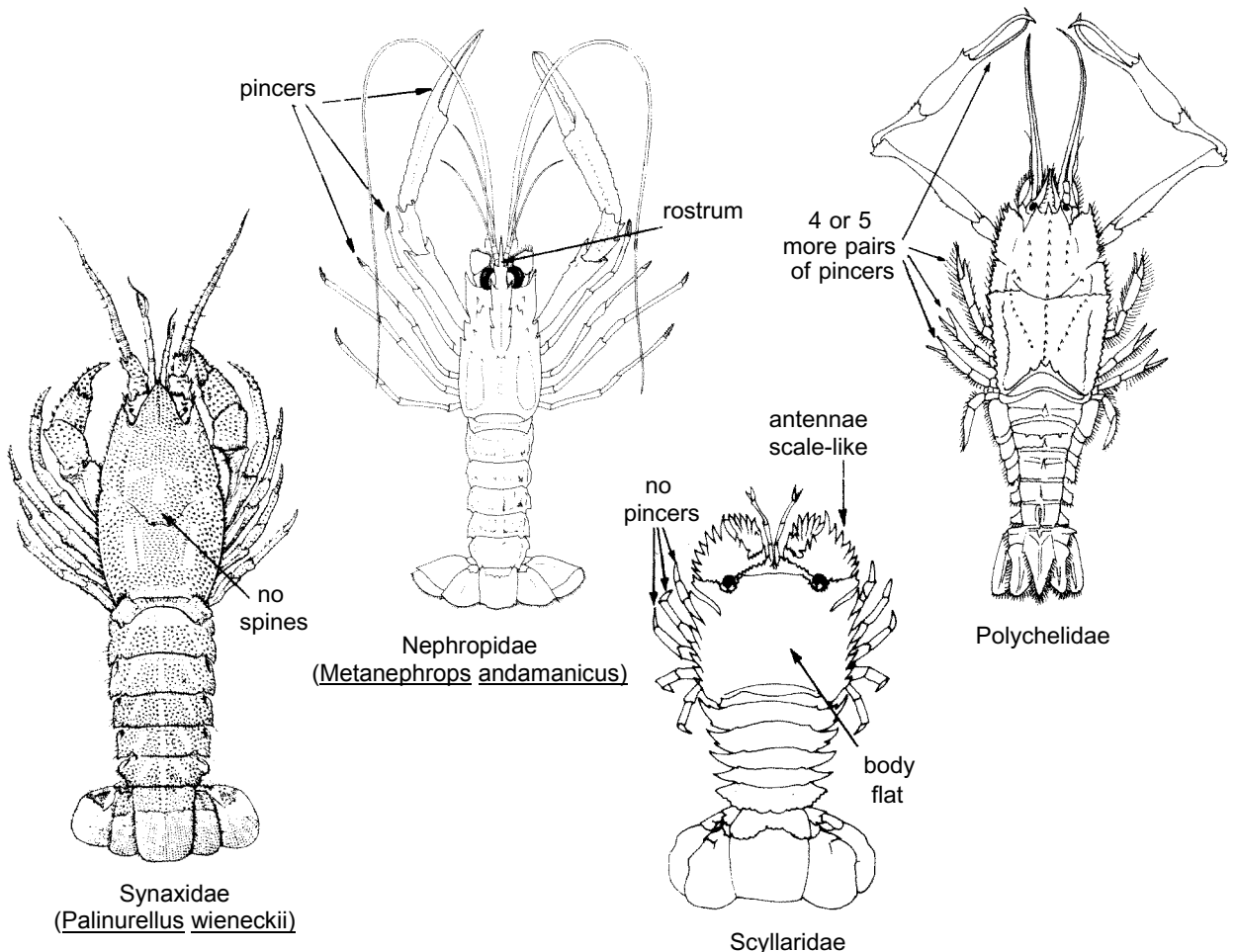
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Synaxidae (Palinurellus wieneckii): carapace covered with small, rounded granules but without enlarged spines; a small median triangular rostrum present; first pair of legs at least twice as thick as the second; entire body hairy and bright orange or red.

Nephropidae: body tubular; a well developed rostrum present; first 3 pairs of legs ending in true pincers, first pair much larger than the others.

Scyllaridae: body flattened, firm; rostrum rudimentary or absent; first 4 pairs of legs without pincers; antennae plate-like, without flagellum.

Polychelidae: body flattened, soft; rostrum absent or rudimentary; first 4 pairs of legs with pincers, the first greatly elongated; antennae whip-like. Deep-sea inhabitants.





**KEY TO GENERA OCCURRING IN THE AREA:**

1a. First pair of legs enlarged in males, ending in apparent (false) pincers, with wide, red crossbands; carapace ornamented with a strong, scale-like sculpture; tail brick red, with 4 or 5 conspicuous transverse grooves on each segment and with yellowish spots and stripes (Fig.1) ..... Justitia

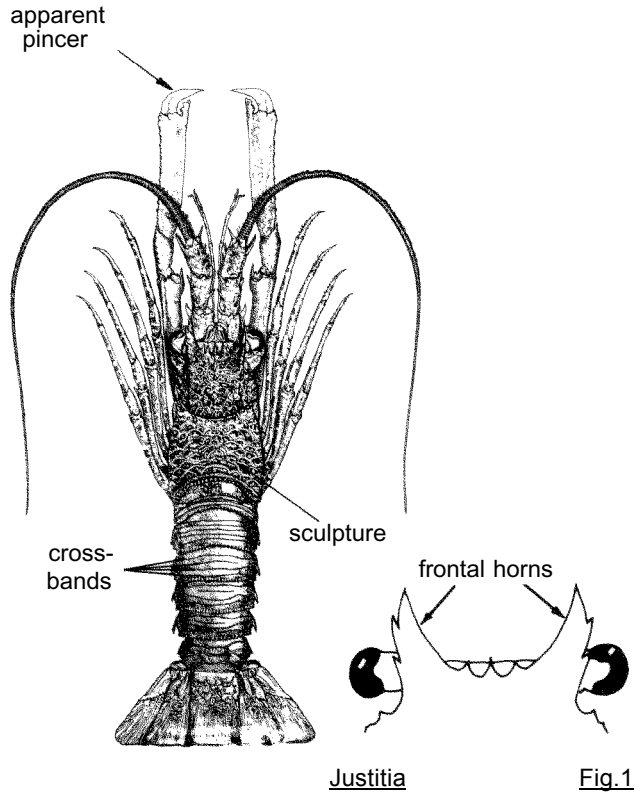
1b. First pair of legs not enlarged, with no trace of a pincer, without crossbands; carapace without a scale-like sculpture; tail variously coloured, smooth or with at most 2 transverse grooves (Figs 2 to 6)

2a. Frontal horns fused to a broad 2- or 4-spined median projection on the anterior margin of the carapace between the eyes (Fig.2); antennal flagella straight, inflexible ..... Linuparus

2b. Two distinct, widely separated tooth-like frontal horns, between which the anterior margin of the carapace is visible (Figs 3 to 6); antennal flagella, although large and firm, quite flexible

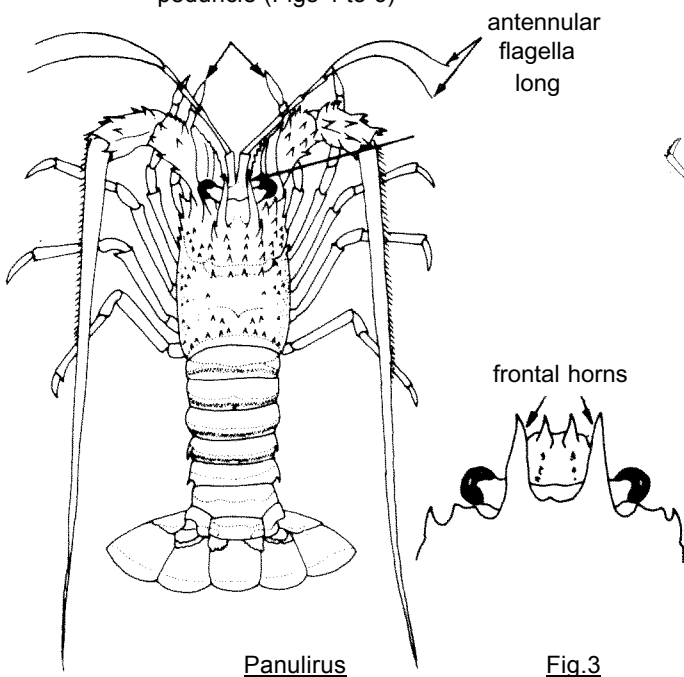
3a. Flagella of antennulae long, whip-like, longer than peduncle of antennule (Fig.3) ..... Panulirus

3b. Flagella of antennules short, shorter than last segment of antennular peduncle (Figs 4 to 6)



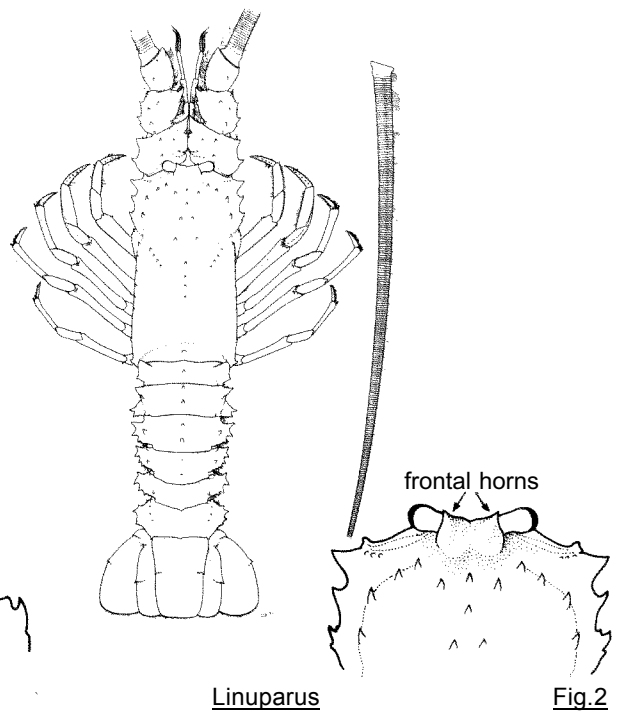
Justitia

Fig.1



Panulirus

Fig.3



Linuparus

Fig.2

4a. Abdominal segments with squamiform sculpturation before transverse groove; no distinct plate between bases of antennae (Fig.4) ..... Jasus

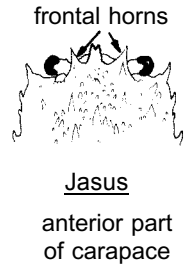
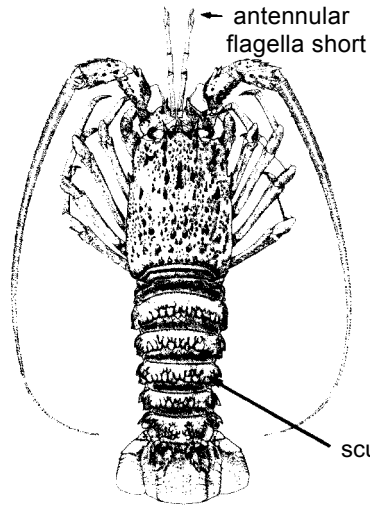
4b. Abdominal segments with a sometimes interrupted transverse groove, but without squamiform sculpturation; a distinct antennular plate between bases of antennae

5a. Frontal horns truncated with anterior margin crenulate; first segment of antennular peduncle reaching beyond antennal peduncle (Fig.5) ..... Palinustus

5b. Frontal horns tapering to a sharp point; first segment of antennular peduncle not over-reaching antennal peduncle

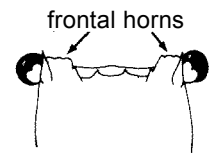
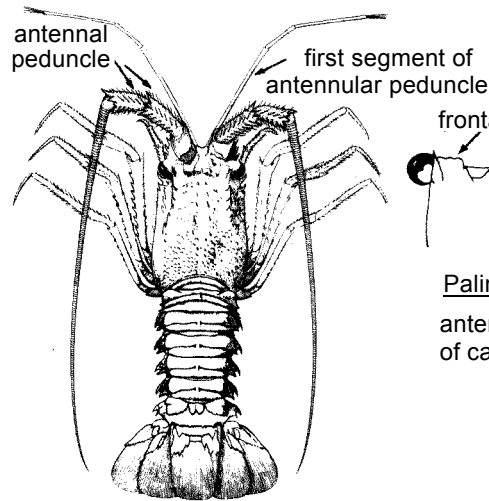
6a. Anterior margin of carapace between frontal horns with about 10 small, sharp teeth; pleura of second to fifth abdominal segments ending in a strong tooth with denticles on posterior margin (Fig.6) ..... Palinurus

6b. Anterior margin of carapace between frontal horns without teeth, only a single small tooth in basal part of anterior margin of each frontal horn; pleura of second to fifth abdominal segments ending in two about equally strong teeth (Fig.7) .... Puerulus



Jasus

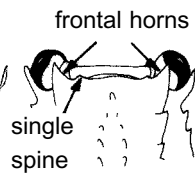
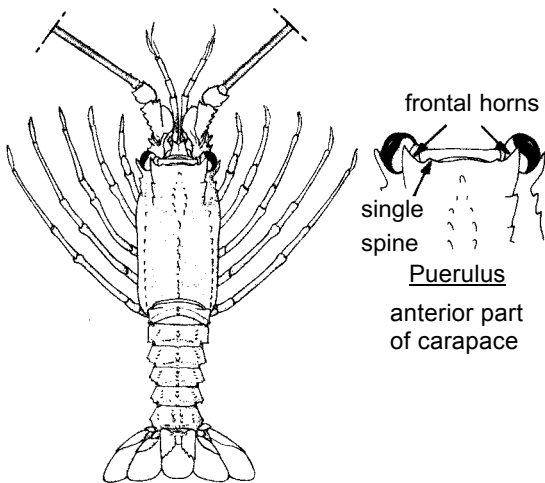
Fig.4



Palinustus  
anterior part of carapace

Palinustus

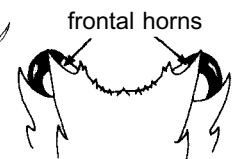
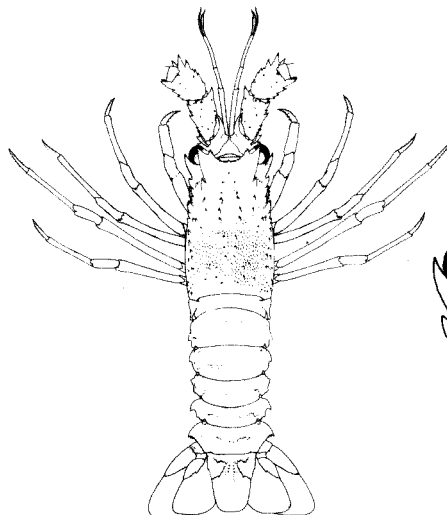
Fig.5



Puerulus  
anterior part of carapace

Puerulus

Fig.7



Palinurus  
anterior part of carapace

Palinurus

Fig.6

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

<u>Jasus paulensis</u> (Heller, 1862)	PALIN Jas 1
<u>Justitia japonica</u> (Kubo, 1955)	
<u>Justitia mauritiana</u> (Miers, 1882)	PALIN Just 1
<u>Linuparus somniosus</u> Berry & George, 1972	PALIN Lin 1
<u>Palinurus delagoae</u> Barnard, 1926	PALIN Palin 4
<u>Palinustus mossambicus</u> Barnard, 1926	
<u>Palinustus unicornutus</u> Berry, 1979	
<u>Panulirus homarus homarus</u> (Linnaeus, 1758)	}
<u>Panulirus homarus megasculptus</u> (Pesta, 1915)	
<u>Panulirus homarus rubellus</u> Berry, 1974	
<u>Panulirus longipes longipes</u> (A. Milne Edwards, 1868)	
<u>Panulirus ornatus</u> (Fabricius, 1798)	
<u>Panulirus penicillatus</u> (Olivier, 1791)	PALIN Panul 6
<u>Panulirus polyphagus</u> (Herbst, 1793)	PALIN Panul 7
<u>Panulirus versicolor</u> (Latreille, 1804)	PALIN Panul 8
	PALIN Panul 9
	PALIN Panul 10
	PALIN Pariul 11
<u>Puerulus angulatus</u> (Bate, 1888)	
<u>Puerulus carinatus</u> Borradaile, 1910	
<u>Puerulus sewelli</u> Ramadan, 1938	PALIN Puer 1

Prepared by L.B. Holthuis, Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands, and R.W. George, Western Australian Museum, Perth, Australia.

Main species illustrations redrawn from literature; original drawings of Linuparus somniosus and Palinurus delagoae prepared by W. Gertenaar

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)Jasus paulensis (Heller, 1862)

## OTHER SCIENTIFIC NAMES STILL IN USE:

Sometimes incorrectly identified with the South African Jasus lalandii (H. Milne Edwards, 1837)

## VERNACULAR NAMES:

FAO : En - St. Paul rock lobster  
Fr - Langouste de St. Paul  
Sp - Langosta de St. Paul

NATIONAL:

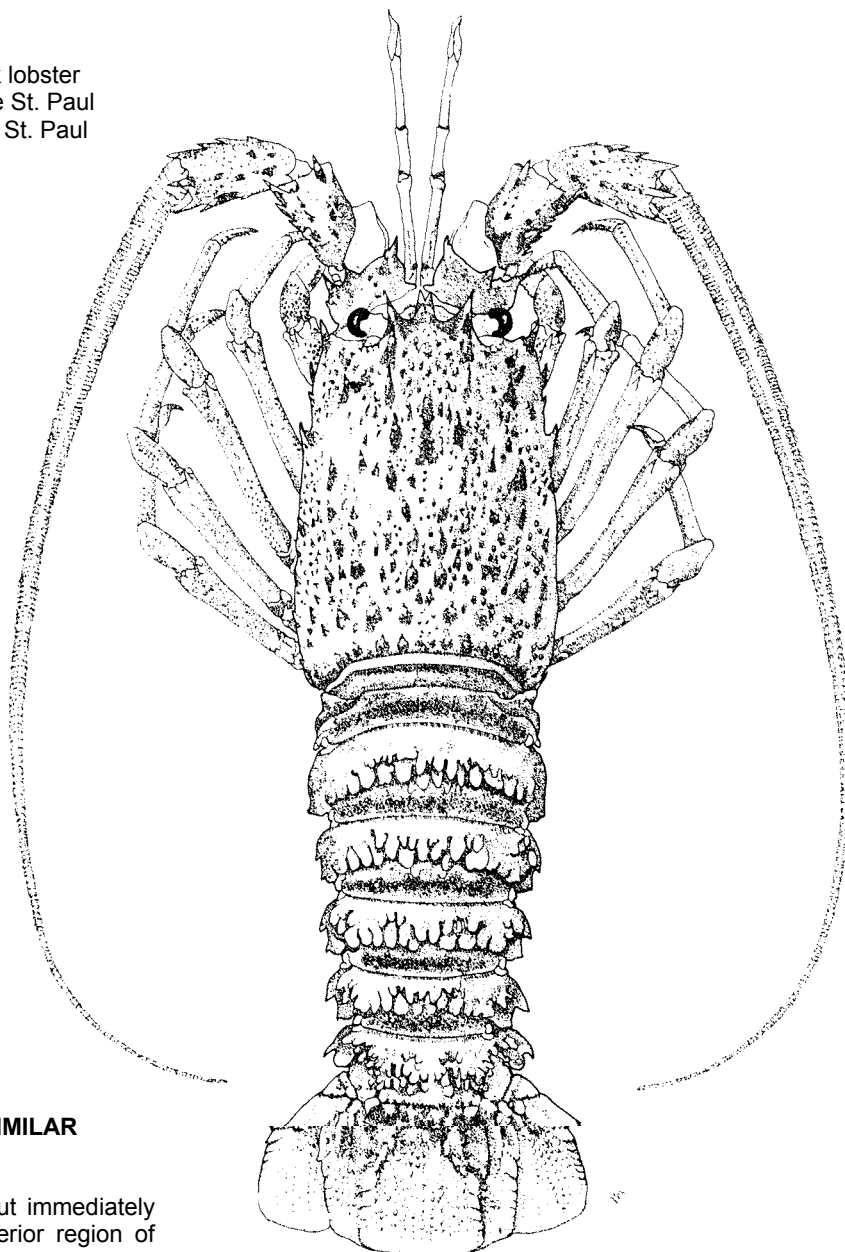
## DISTINCTIVE CHARACTERS:

Carapace cylindrical, closely beset with flattened larger and more cylindrical smaller spines; a small rostrum is present, clasped by 2 lateral processes; 2 strong frontal horns sharply pointed, without denticles. Antennular flagella very short, less than half the length of last segment of antennular peduncle; bases of antennae close together, not separated by an antennular plate; no stridulating organ. Abdominal segments 2 to 6 with a single transverse groove preceded by 1 or 2 rows of large, flattened, squamiform sculpturations, and followed by a single row of very small squamae; anterior and posterior parts of the segments smooth. First 4 legs without pinners; a broad spine in the distal half of the propodus sometimes gives the first leg (which might be swollen), a subchelar appearance.

Colour: brick red to dark brown, sometimes dark purple to almost black. The specimens in shallow water are usually lighter than those from greater depths.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Jasus lalandii (not in this area but immediately adjacent (West and South Africa)): anterior region of first abdominal segment with a row of squamiform sculpturations (naked in J. paulensis); merus of walking legs smooth (distinctly tuberculate in J. paulensis).



0. 7 cm

No other lobster species in the area shows the squamiform sculpturation on the abdomen, typical of J. paulensis.

Further distinguishing characters of other lobster genera are the following:

Justitia: abdominal segments with 4 or 5 transverse grooves (squamation sculpture in Jasus); upper margin of frontal horns toothed. Carapace (but not abdomen) covered with scale-like sculpturing.

Panulirus: antennular flagella longer than peduncle; antennular plate and stridulating organ present.

Linuparus: frontal horns fused to a quadrangular median process, with 2 points placed over bases of eyes.

Palinurus: anterior margin of carapace between frontal horns and anterior margin of these horns toothed.

Palinustus: antennular plate and stridulating organ present; frontal horns truncated, their distal margin crenulate.

Puerulus: antennular plate and stridulating organ present; frontal horns with a single tooth on anterior margin; carapace strongly ridged.

**SIZE:**

Maximum: total body length, 37.4 cm; average total body length in catches: 20 to 28 cm (males) and 19 to 21 cm (females).

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

The species is restricted to St. Paul and Amsterdam Islands in the southern Indian Ocean.

It lives in depths from 0 to 60 m, being most abundant between 10 and 35 m; it prefers rocky or gravel bottoms and is often found in the kelp zone.

**PRESENT FISHING GROUNDS:**

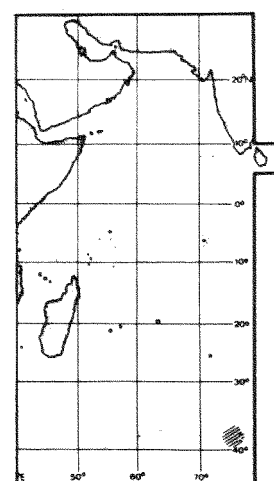
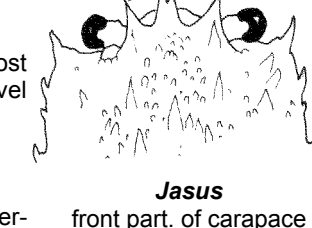
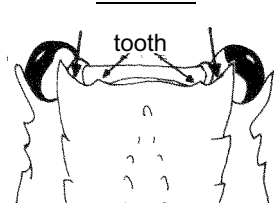
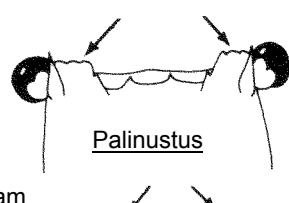
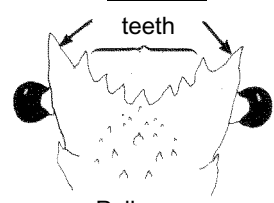
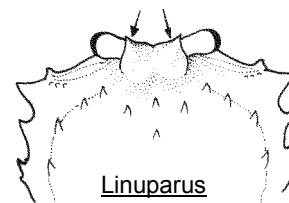
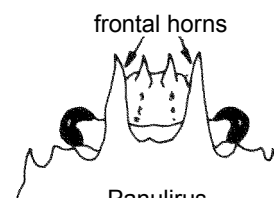
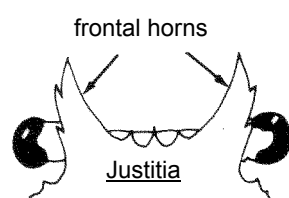
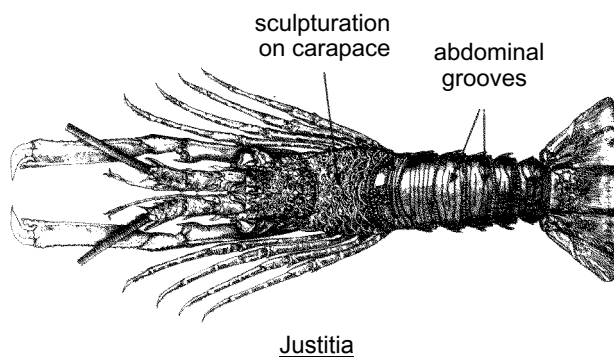
A fishery with lobster pots is run by French fishermen.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species; the annual catch for 1976 to 1981 is estimated at 210 metric tons.

A factory ship processes the animals that are brought in by small motor boats, the crews of which work the pots.

Marketed canned or frozen.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)*Justitia mauritiana* (Miers, 1882)

OTHER SCIENTIFIC NAMES STILL IN USE : None

## VERNACULAR NAMES:

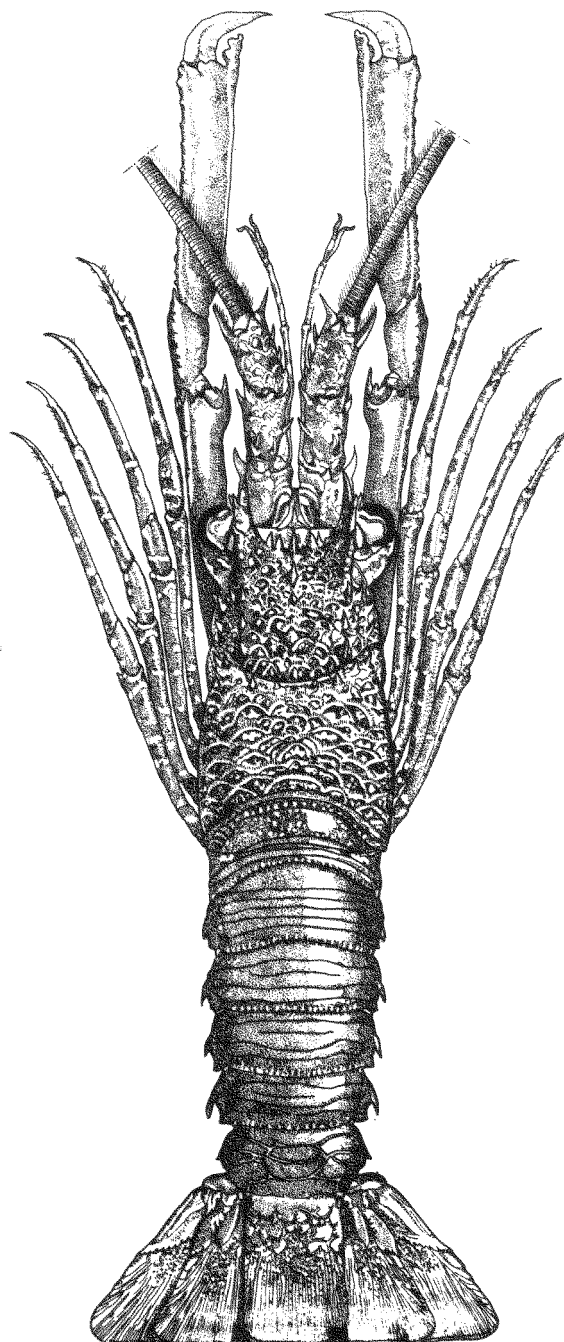
FAO :           En - Longarm spiny lobster  
                  Fr - Langouste gibbon  
                  Sp - Langosta de muelas

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace cylindrical, covered with a scale-like sculpturing; several spines or, anterior half and behind the cervical groove; anterior margin with a median spine flanked at either side by 2 or 3 smaller spines; frontal horns large, with teeth on upper margin. Antennae long, stiff, flagella very short, shorter than last segment of peduncle; antennular plate spineless, forming a stridulating organ with the antennal base. Each abdominal segment with 4 or 5 conspicuous transverse grooves not interrupted on midline. First pair of legs in males greatly enlarged and ending in apparent (false) pincers (fixed finger very small).

Colour: body red; antennae and antennules banded with red; outer surface of the large legs also with red bands, their inner surface almost entirely red; other legs banded or spotted with red.



0 3,5 cm

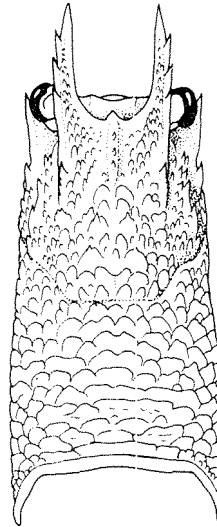
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Justitia japonica: abdominal segments with more than 5 transverse grooves, some interrupted (4 or 5 uninterrupted grooves in J. mauritiana); anterior margin of carapace between frontal horns with only a median spine; no spines on carapace behind cervical groove.

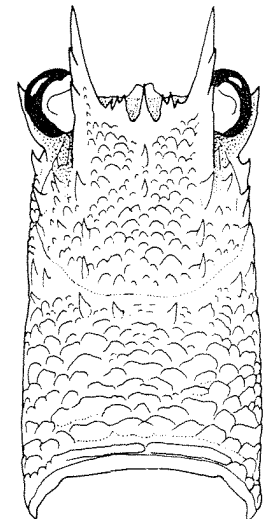
No other lobster species in the area has the characteristic sculpturing on carapace. None has more than one transverse groove on each abdominal segment.

### SIZE:

Maximum: total body length 16 cm, carapace length 6 cm. Average carapace length 4 or 5 cm.



Justitia japonica



Justitia mauritiana

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

J. mauritiana occurs off Mauritius, La Réunion and the Hawaiian Islands. Larvae assigned to this form have been reported from the Philippines, the Gilbert Islands and Tahiti. Another species, J. longimanus, is known from Bermuda, the tip of Florida and most of the Antilles.

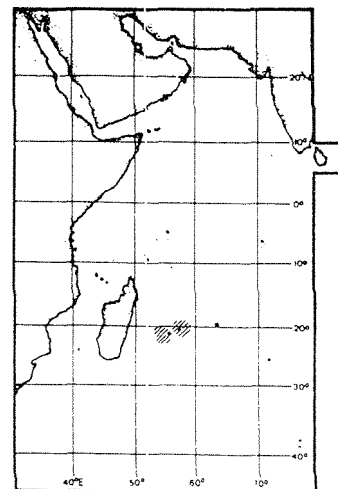
Its habits are not known, apart from the fact that it has been taken at depths between 30 and 200 m. J. longimanus has been reported from the outer parts of coral reef slopes. It seems to prefer rocky bottoms.

### PRESENT FISHING GROUNDS:

Not actively fished for in the area. Experimental fishing with lobster pots and trammel nets resulted in catches of this species near La Réunion. The small size, apparent scarcity and the great depths it inhabits, makes this species highly unlikely to ever prove interesting from a commercial point of view.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)Linuparus somniosus Berry & George, 1972

## OTHER SCIENTIFIC NAMES STILL IN USE:

Sometimes not distinguished from the Japanese Linuparus trigonus (Von Siebold, 1824)

## VERNACULAR NAMES:

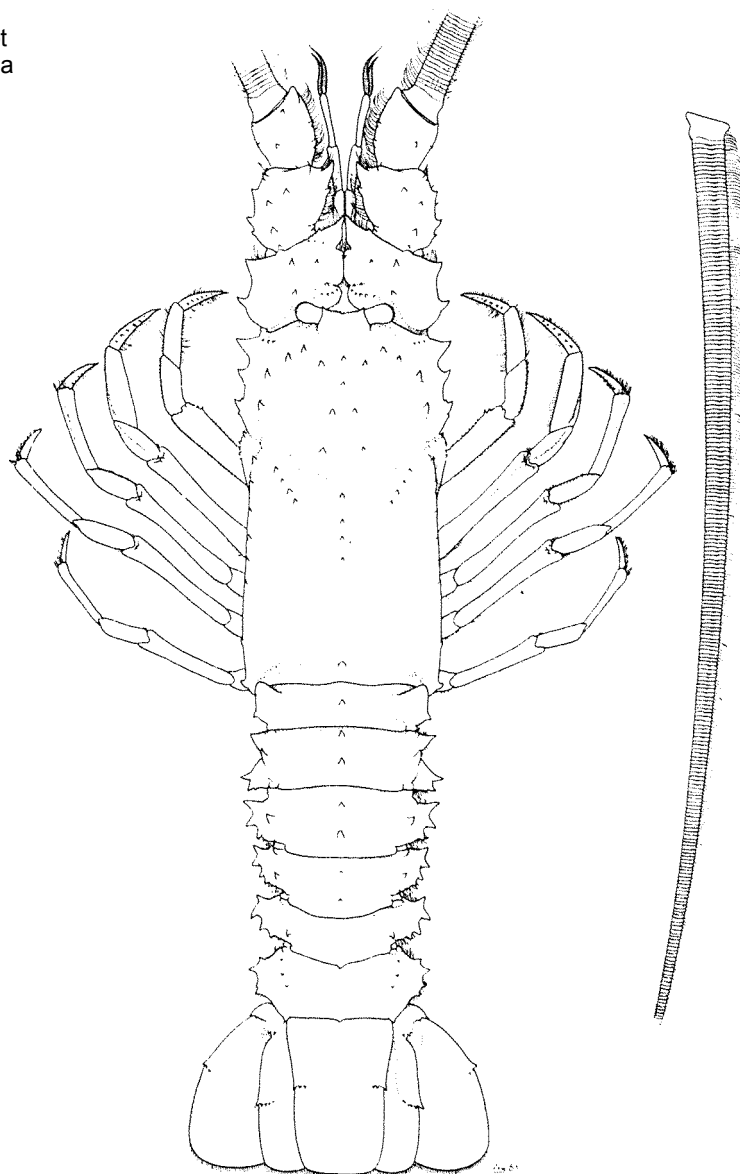
FAO : En - Spear lobster  
Fr - Langouste javelot  
Sp - Langosta jabalina

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace angular dorsally, with one median and 2 lateral longitudinal crests behind the cervical groove, each crest provided with tubercles; posterior groove of carapace wide in the middle, narrow laterally; the 2 frontal horns are moved to the central part of the anterior margin and fused to a single broad 2- or 4-pointed lobe between the eyes; surface of carapace with numerous small granules and larger tubercles. Antennules slightly over-reaching antennal peduncle, flagella short, slightly longer than last segment of antennular peduncle; antennae long, flagella long and stiff, slightly flattened and rigid; bases of antennae touching each other, antennular plate very small, covered by a stridulating organ. Tail powerful; each abdominal segment with at most 1 transverse groove; and, on each side, a longitudinal, tuberculate crest over the bases of the pleura; first 5 segments with a median crest bearing 1 or 2 larger and sometimes some smaller tubercles, crest of 6th segment double. Legs 1 to 4 without pincers.

Colour: reddish brown dorsally; laterally and ventrally mostly whitish; antennal flagella dirty white.



0 8 cm

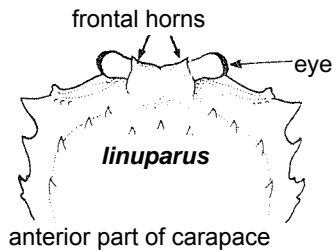


## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

All other species of Palinuridae: frontal horns widely separated, not fused; abdomen cylindrical, without a longitudinal crest over bases of pleura.

## SIZE:

Maximum: total body length about 35 cm, carapace length 14 cm; average carapace length about 10 cm.



## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Off the coast of East Africa between Kenya and Natal in depths between 216 and 375 m or, rough bottoms of sand and mud.

## PRESENT FISHING GROUNDS:

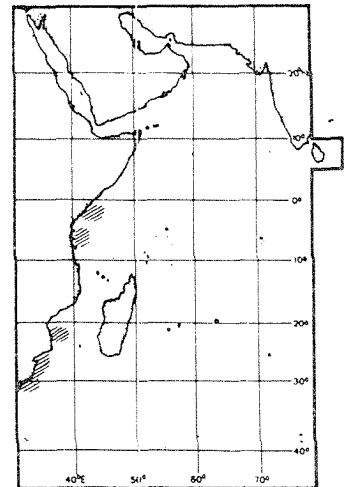
Not fished commercially in most of its range, but according to Ivanov & Krylov (1980, *Crustaceana*, 38:286) the species supports a commercial fishery off Tanzania, and off southern Zanzibar, where catches of over 10 kg/h were taken.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Taken with bottom trawls.

Marketed mostly fresh.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)*Palinurus delagoae* Barnard, 1926OTHER SCIENTIFIC NAMES STILL IN USE: *Palinurus gilchristi delagoae* Barnard, 1926

## VERNACULAR NAMES:

FAO: En - Natal spiny lobster  
Fr - Langouste de Natal  
Sp - Langosta de Natal

NATIONAL :

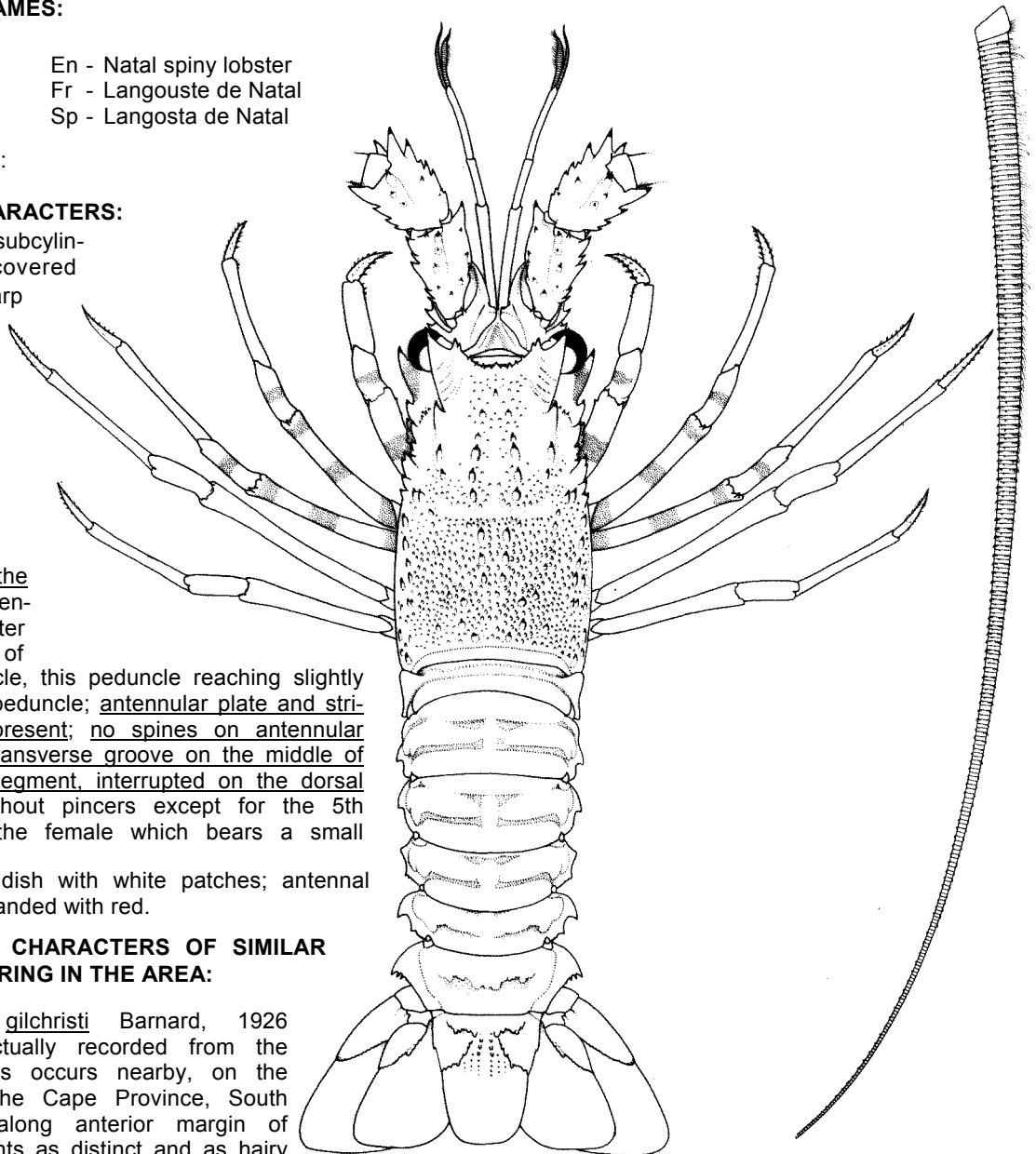
## DISTINCTIVE CHARACTERS:

Carapace subcylindrical dorsally, covered with numerous sharp spinules; frontal horns large, flattened with denticles on inner margin; anterior margin of carapace with a median spinule and some additional denticles between bases of the frontal horns. Antennular flagella shorter than last segment of antennular peduncle, this peduncle reaching slightly beyond antennal peduncle; antennular plate and stridulating organs present; no spines on antennular plate. A distinct transverse groove on the middle of each abdominal segment, interrupted on the dorsal midline. Legs without pincers except for the 5th pair of legs of the female which bears a small pincer.

Colour: reddish with white patches; antennal flagella and legs banded with red.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

*Palinurus gilchristi* Barnard, 1926 (although not actually recorded from the area, this species occurs nearby, on the south coast of the Cape Province, South Africa): groove along anterior margin of abdominal segments as distinct and as hairy as the groove over the middle (anterior groove inconspicuous in *P. delagoae*); carapace before cervical groove pubescent (naked in *P. delagoae*); merus of walking legs triangular in section, its flat outer surface hairy (merus cylindrical and naked in *P. delagoae*).



0 3.5 cm

Jasus paulensis: abdomen with squamiform sculpturation; antennal bases contiguous, antennular plate and stridulating organ absent.

Justitia species: abdomen with 4 or more transverse grooves on each segment; carapace with squamiform sculpturation; frontal horns dorsally with teeth.

Linuparus somniosus: abdomen with a longitudinal tuberculate crest running above the bases of the pleura; frontal horns close together, fused at their bases.

Palinustus species: abdominal pleura ending posteriorly in 2 almost equal spines, no additional spinules on posterior margin; anterior spinules present on second pleura; frontal horns truncated, their distal margin crenulate.

Panulirus species: abdomen either without grooves at all (P. ornatus, P. polyphagus) or with the anterior margin of the groove crenelated (P. homarus), or with the groove uninterrupted, or if interrupted, then not by a sharp median longitudinal ridge (P. longipes, P. penicillatus). Antennal flagella longer than the peduncle; frontal horns sharp, without denticles on either margin.

Puerulus species: median crest of first 5 abdominal segments high and interrupted, that of sixth segment double (in Palinurus delagoae median crest low, hardly protruding above the level of the segment, absent from sixth segment); frontal horns with a single tooth on inner margin, no denticles on anterior margin of carapace; posterior half of carapace with 3 longitudinal ridges.

**SIZE:**

Maximum: total body length about 35 cm, carapace length 17 cm; average carapace length about 10 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Along the southeast African coast, between Mozambique (south of 17°S) and Natal (north of 30°S); also off southeast Madagascar.

Reported from depths between 0 and 400 m; usually found between 180 and 324 m. Off southeast Africa it occurs on mud with sand or coral fragments, while off Madagascar it is taken on rocky bottoms. The species is gregarious and seems to migrate, and then can sometimes be caught in enormous numbers (Berry, 1971).

**PRESENT FISHING GROUNDS :**

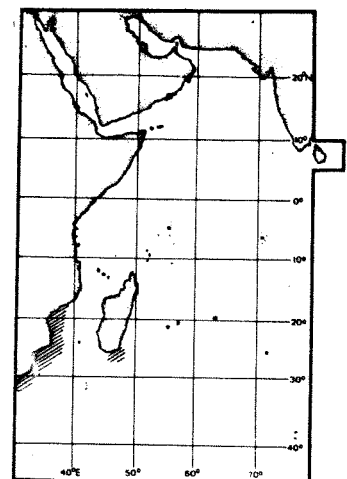
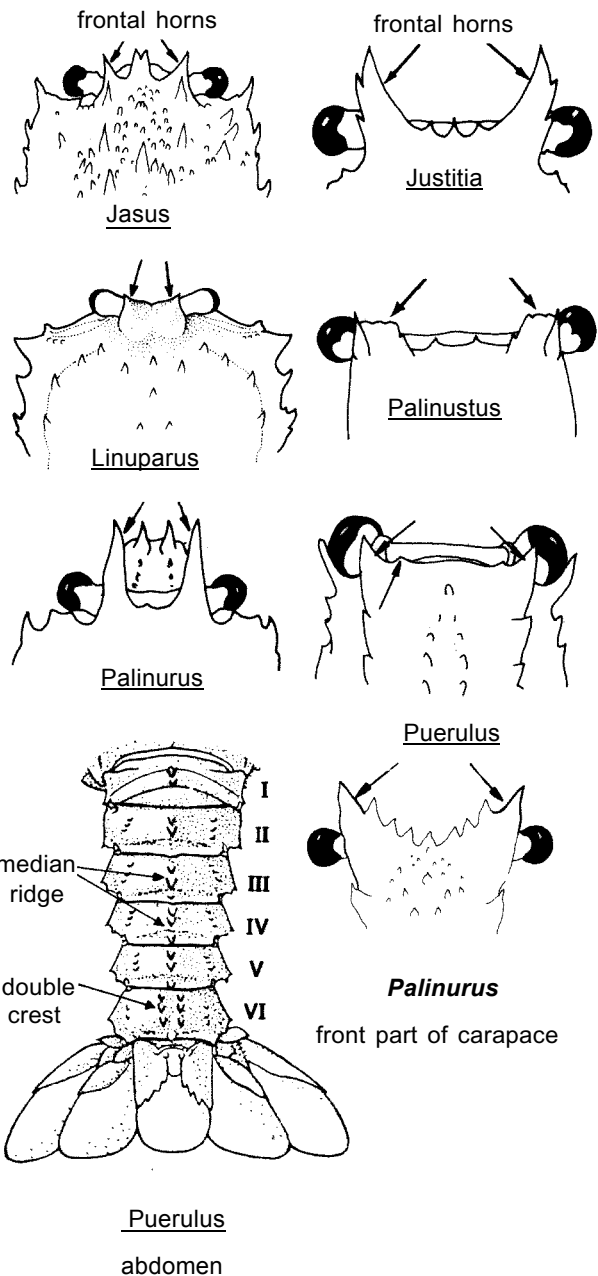
Southeast Africa.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :**

In South Africa the annual catch in metric tons was 100 (both in 1972 and 1973), 86 (in 1974), 53 (in 1975), 61 (in 1976), 19 (in 1977), 71 (in 1978), 106 (in 1979), 156 (in 1980) and 143 (in 1981).

Off Southeast Africa it is caught by trawlers, while off Madagascar it was taken in lobster pots during experimental fishing.

The species is marketed frozen.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)Panulirus homarus (Linnaeus, 1758)

## OTHER SCIENTIFIC NAMES STILL IN USE:

Panulirus dasyopus (H. Milne Edwards, 1837)Panulirus burgeri (De Haan, 1841)

## VERNACULAR NAMES:

FAO : En - Scalloped spiny lobster  
Fr - Langouste festonnée  
So - Langosta festoneada

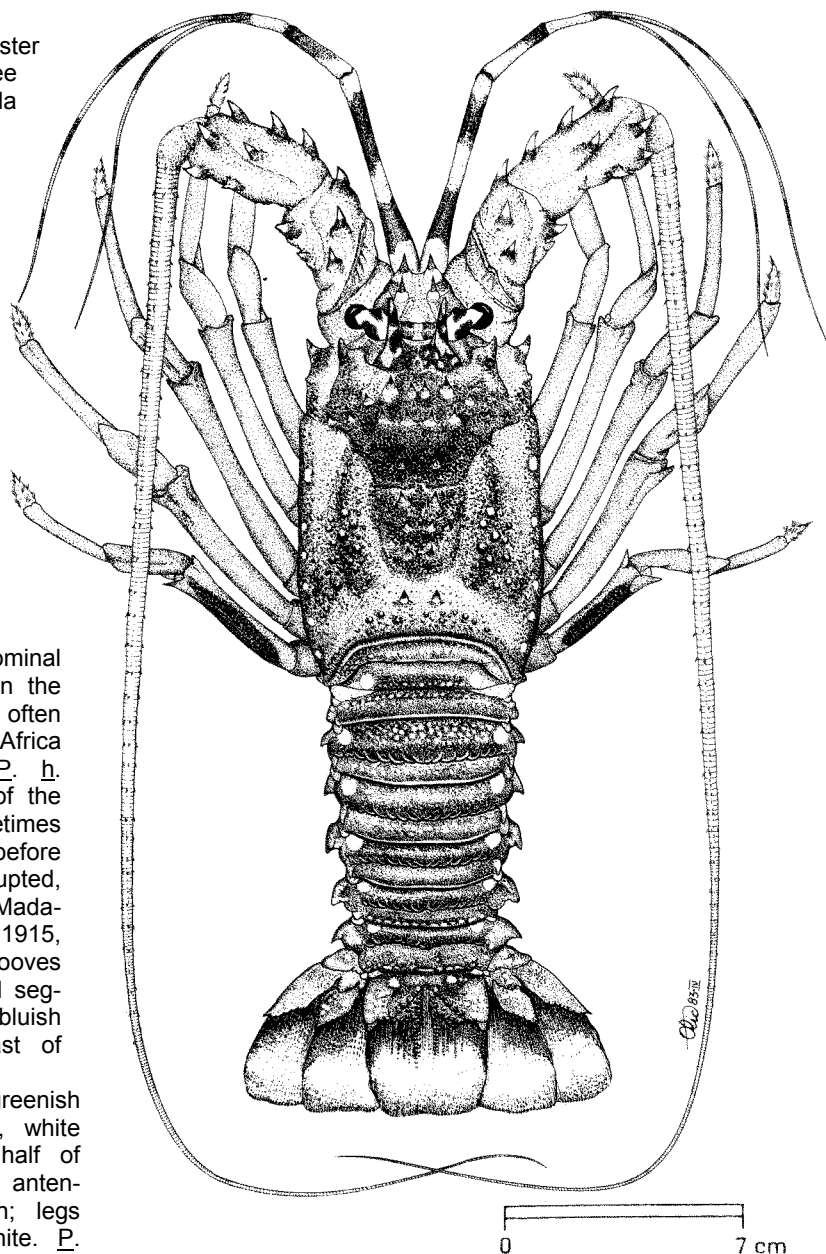
NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace rounded, covered with numerous spines of varying size. Flagella of antennules longer than peduncle, rostrum absent; bases of antennae separated by a broad antennular plate bearing 2 equal, well separated pairs of principal spines and scattered smaller spines in between. Each abdominal segment with a transverse groove, sometimes interrupted in the middle, its anterior margins formed into shallow scallops. Legs 1 to 4 without pincers. In the Western Indian Ocean 3 forms are recognized: P. h. homarus (Linnaeus, 1758) with the scallops of the abdominal grooves small and indistinct, especially in the median part of the groove, which is often interrupted there, colour greenish (East Africa to Japan, Indonesia and Australia); P. h. rubellus Berry, 1974, with the scallops of the abdominal grooves deep and large (sometimes with traces of a second row of scallops before the first), abdominal grooves uninterrupted, colour brick red (South East Africa, Madagascar) and P. h. megasculptus Pesta, 1915, with the scallops of the abdominal grooves large and deep, surface of the abdominal segments coarsely pitted, colour dark bluish brown (Socotra Island and South coast of Arabian Peninsula).

Colour: P. h. homarus is dark greenish to blackish with numerous, very small, white spots (especially distinct on posterior half of abdomen), without transverse bands; antennules banded with white and greenish; legs with indistinct spots and stripes of white. P. h. rubellus is brick red with the same arrangement of white small spots as in the previous form; white bands, spots and stripes of anten-

nules and legs as in P. h. homarus. P. h. megasculptus is dark bluish brown or bluish red, with the white spots on the abdomen more distinct than in the 2 other forms, a white transverse band along the posterior margin of abdominal segments 1 to 4, tips of scallops also with distinct white spots; antennules banded with white, legs with indistinct white spots and stripes.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The scalloped anterior margin of the transverse groove of the abdominal segments distinguishes *P. homarus* from all other species of the family Palinuridae. In this feature it comes closest to *Jasus paulensis*, in which, however, several rows of squamae are found on the anterior half of the segments; furthermore, *Jasus paulensis* lacks an antennular plate and is restricted to the St. Paul and Amsterdam Islands.

*Panulirus longipes* and *P. polyphagus* have only 2 large spines on the antennular plate, in *P. penicillatus* the 4 spines touch each other at the base and in *P. ornatus* and *P. versicolor* the posterior pair of 4 spines are smaller than the anterior.

All other lobster genera in the area have the antennular flagella shorter than the distal segment of the antennular peduncle.

**SIZE:**

Maximum: body length 30 cm; carapace length 12 cm; average body length 20 to 25 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

*P. h. homarus*: East Africa to Japan, Indonesia and Australia, possibly Tahiti. *P. h. rubellus*: southeast Africa, southeast Madagascar. *P. h. megasculptus*: south coast of the Arabian Peninsula, Socotra and perhaps the west coast of India.

Found in waters down to 90 m depth but its optimal depth ranges from 1 to 5 m. Gregarious and nocturnal, inhabiting shallow coastal, sometimes turbid waters; it shelters in and among rocks, often in the surf zone.

**PRESENT FISHING GROUNDS:**

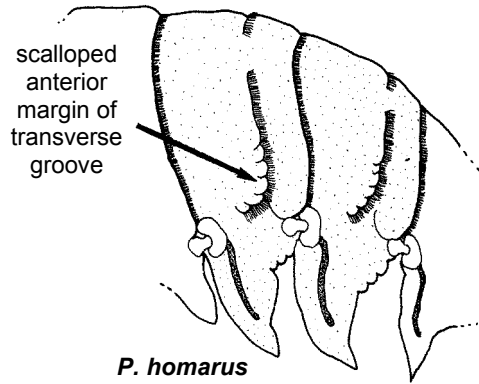
In South Africa, until 1965 the exploitation was "restricted to the efforts of Bantu children in the intertidal zone, and of divers in somewhat deeper waters; in 1969 a company was formed for the exploitation of this species on a commercial basis" (Heydorn, 1969). The exploitation of the species resulted in the necessity for conservation. Although off the southeast African coast (Natal) *P. homarus* is the most frequent of the *Panulirus* species, on the East African coast (Zanzibar, Kenya) it belongs to the less common lobsters. Off Somalia, the annual catch is about 120 metric tons (Druzhinin, 1973). It is the most important contributing species to the lobster fishery of the southwest coast of Madras and Kerala, India (Jhingran, 1982)

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

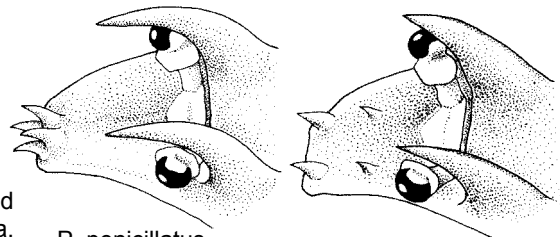
Caught by hand (often with a dead *Octopus* as a lure, S.E. Africa), with traps (Madagascar), with castnets or arrowhead traps (South Yemen) with anchor hooks, lobster traps and gillnets (India).

Marketed fresh, and in some areas exported frozen.



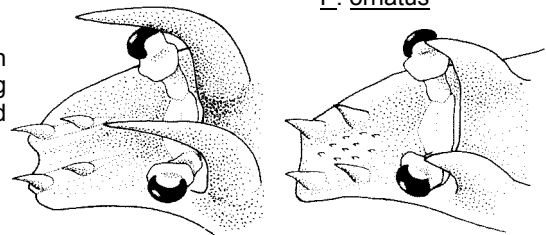
*P. homarus*

abdomen



*P. penicillatus*

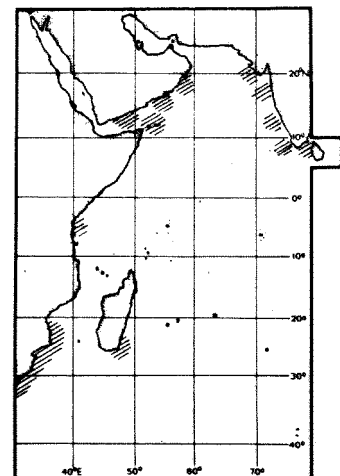
*P. ornatus*



*P. ornatus*

*P. homarus*

antennular plate (dorsolateral view)



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY : PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)Panulirus longipes longipes (A. Milne Edwards, 1868)OTHER SCIENTIFIC NAMES STILL IN USE : Panulirus japonicus auct. nec v. Siebold

## VERNACULAR NAMES:

FAO : En - Longlegged spiny lobster  
Fr - Langouste diablotin  
Sp - Langosta duende

NATIONAL:

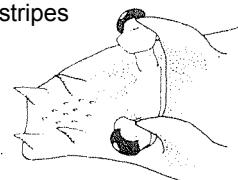
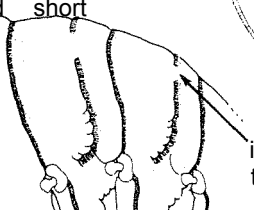
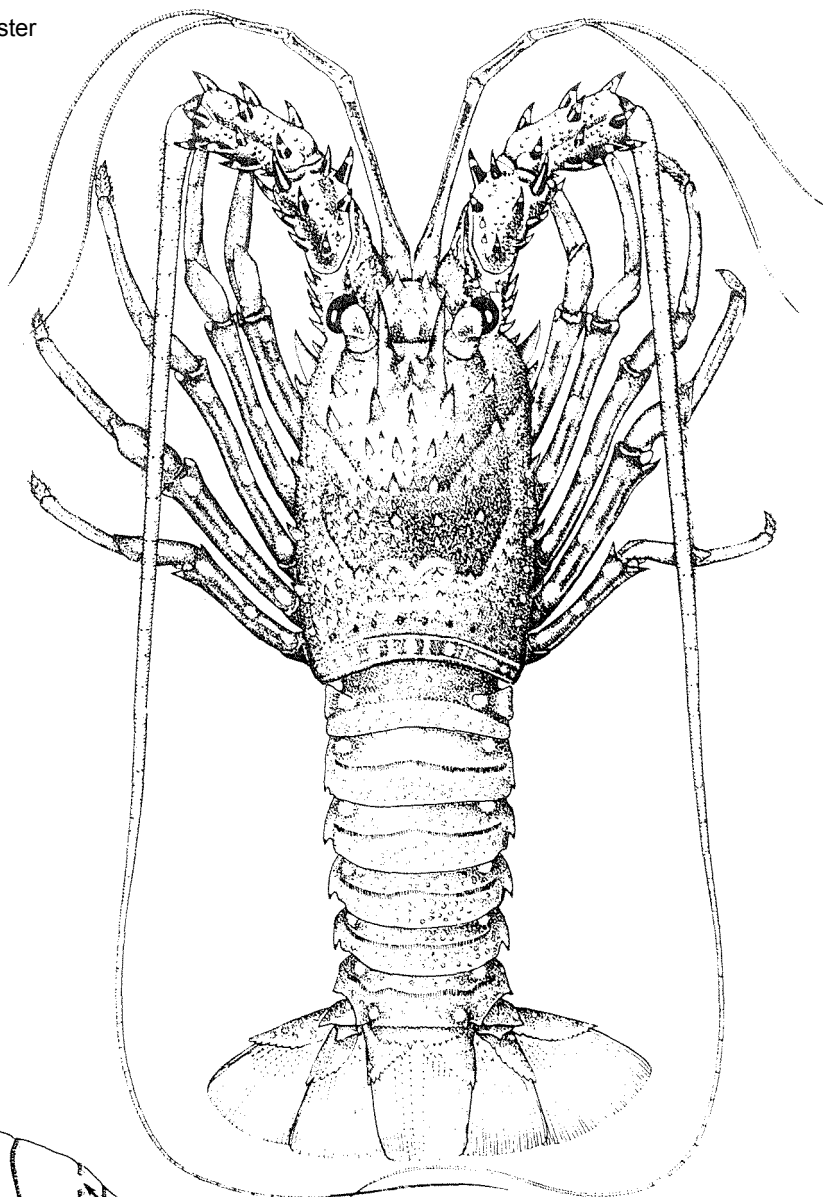
## DISTINCTIVE CHARACTERS:

Carapace rounded, covered with numerous spines of varying size. Flagella of antennules longer than peduncle, rostrum absent; bases of antennae separated by a broad antennular plate bearing 1 pair of principal spines followed by some scattered minor spines. Each abdominal segment with a complete transverse groove joining the pleural groove. Legs 1 to 4 without pincers.

Colour: ground colour variable from brown through blue to indigo; carapace and tail covered with numerous medium-sized pale spots, and a central darker region on the carapace; antennal and antennular flagella crossbanded; legs with spots of white and lines of yellow in between.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Panulirus homarus: abdominal segments with anterior margin of transverse groove scalloped; antennal plate with 2 pairs of large spines and a few spinules; legs with inconspicuous, irregular spots and short stripes

antennular plate  
dorsolateral viewinterrupted  
transverse  
grooveP. homarus abdomen

P. ornatus: abdominal segments smooth, without a transverse groove, with a broad transverse band of a brown colour over the middle and only 2 white blotches on either side; antennular plate with 2 pairs of large spines; legs conspicuously and irregularly spotted.

P. pencillatus: abdomen with numerous, closely placed, very small, pale spots all over; antennular plate with 2 pairs of large spines forming a single cluster, with their bases touching and their tips diverging; legs with distinct sharp longitudinal lines.

P. polyphagus: abdomen smooth, without a transverse groove; a transverse white band present along posterior margin of segments; antennular plate with 2 large spines, without spinules; legs irregularly and inconspicuously blotched.

P. versicolor: abdominal segments without a transverse groove, smooth; a distinct transverse white band flanked by dark blue along posterior margins of segments; a distinctive pattern of blue-black patches and white lines on carapace; antennular plate with 2 pairs of large spines; legs distinctly longitudinally striped.

All other lobster genera in the area: antennular flagella shorter than distal segment of antennular peduncle.

#### SIZE:

Maximum: body length 30 cm; average body length 20 to 25 cm; carapace length of females with eggs 5.5 to 7 cm (in Sri Lanka).

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

East coast of Africa from Natal north to at least Kenya, further in Madagascar, Mauritius, the Seychelles, southern India and Sri Lanka. Outside the area, at the Andaman and Nicobar Islands, the west coast of Thailand, and the west coast of Sumatra. The other subspecies, P. !. femoristriga does not occur in Fishing Area 51 It is reported from Japan, Taiwan Islands, the Philippines, Indonesia to Australia, the New Hebrides and Tahiti.

Found in clear or sometimes slightly turbid, shallow waters around coral reefs, in depths of 1 to 18 m, sheltering in daytime among corals and in deep inaccessible caves where moderate currents prevail and no direct wave action is noticeable. The animals are solitary or occur in pairs and are strictly nocturnal, moving about especially in moonlit nights.

#### PRESENT FISHING GROUNDS:

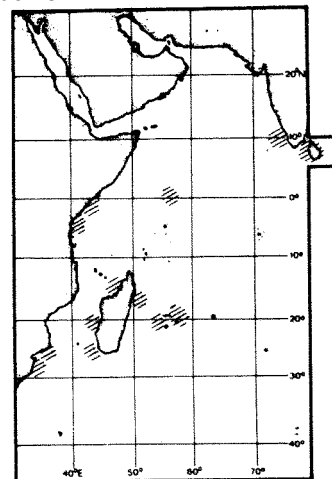
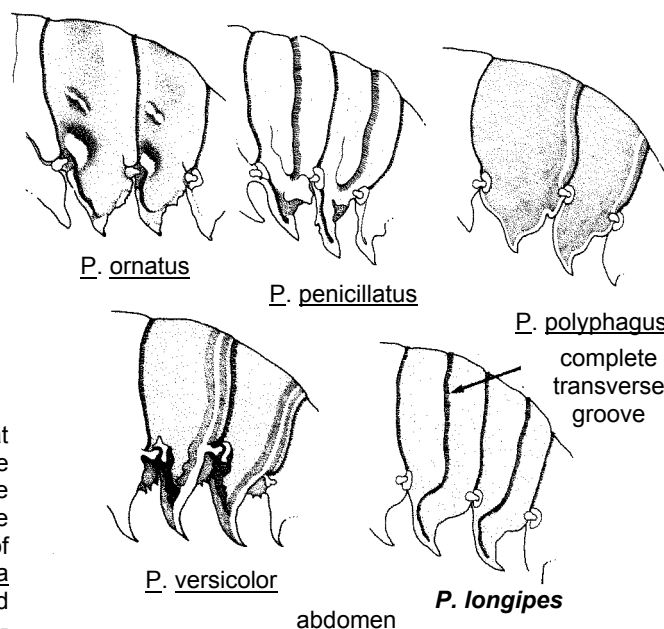
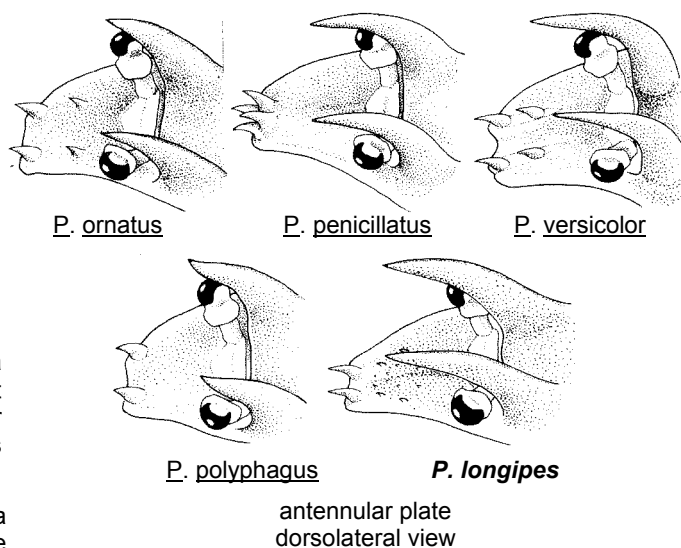
Caught incidentally throughout its range; apparently not abundant.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species. Wherever it occurs, it forms only a small percentage of the lobster catch.

It is usually caught by skin divers, by hand or with spears, but also obtained in lobster pots or traps.

Rarely seen in the markets. Dried specimens offered to tourists (Thailand).



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)*Panulirus ornatus* (Fabricius, 1798)

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

FAO : En - Ornate spiny lobster  
Fr - Langouste ornée  
Sp - Langosta ornamentada

NATIONAL:

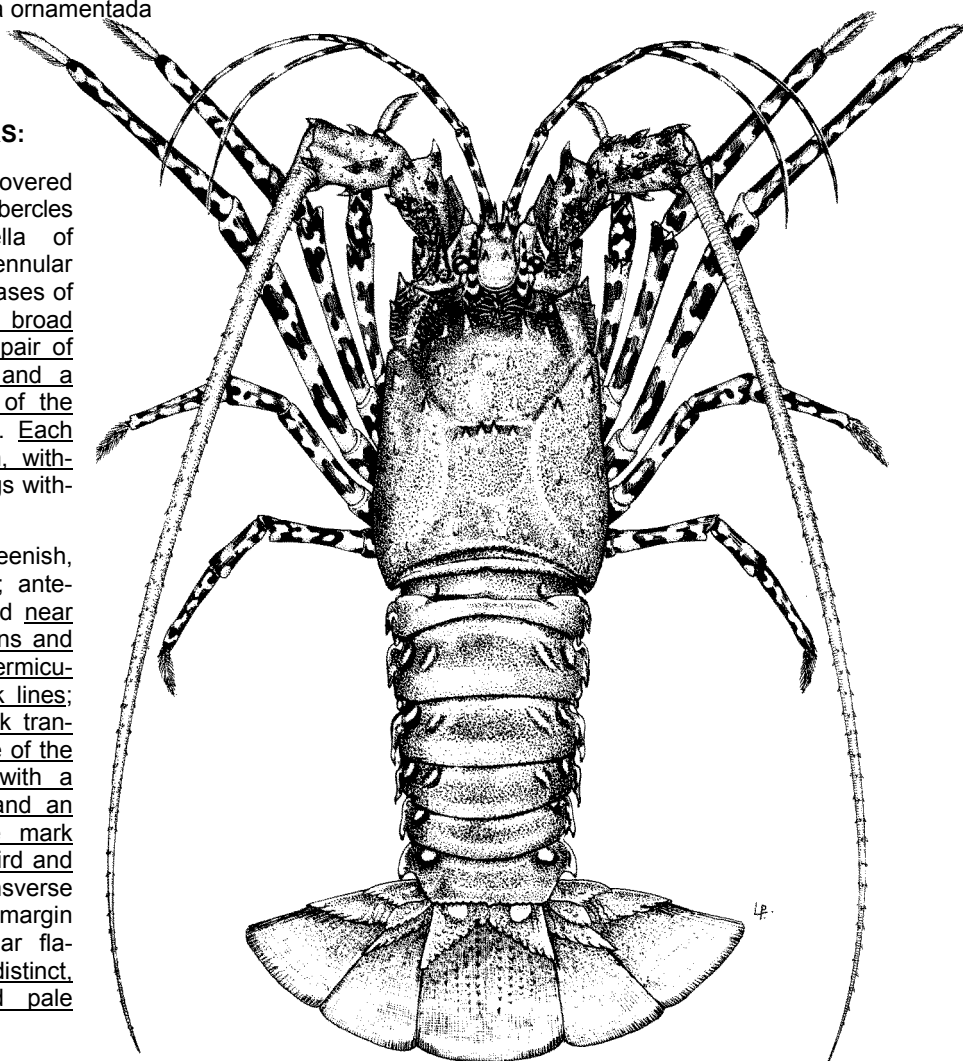
## DISTINCTIVE CHARACTERS:

Carapace rounded, covered with numerous spines and tubercles of different sizes. Flagella of antennules longer than antennular peduncle, rostrum absent; bases of antennae separated by a broad antennular plate bearing 1 pair of principal spines anteriorly and a second pair, half the size of the first, in middle of the plate. Each abdominal segment smooth, without a transverse groove. Legs without pincers.

Colour: bluish or greenish, spines on carapace yellow; anterior part of carapace on and near the bases of the frontal horns and the anterior spines with a vermicular pattern of pale and dark lines; abdomen with a broad, dark transverse band over the middle of the segments, each segment with a large pale spot on sides and an additional oblique elongate mark higher up on the second, third and fourth segments; no transverse white band along posterior margin of the segments; antennular flagella banded; legs with distinct, sharply defined dark and pale blotches.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

The presence of only 2 spots on either side of the second to fourth abdominal segments, and the presence of vermicular markings on and near the bases of frontal horns, distinguish this species from all other *Panulirus* species in the area. Additional distinguishing characters of similar species are the following:



0 11 cm



P. homarus: abdominal segments with a scalloped anterior margin on transverse groove; pale spots and stripes on legs indistinct.

P. longipes: abdominal segments with a transverse groove; ariterinular plate with only 2 large spines.

P. penicillatus: abdominal segments with a transverse groove; aritenular plate anteriorly with a cluster of 4 spines touching each other at their bases; legs striped.

P. polyphagus: abdominal segments with a white band along posterior margin; antennular plate with a single anterior pair of spines. Legs with indistinct, interrupted stripes and blotches.

P. versicolor: abdominal segments with a distinct transverse white band between 2 dark bands along posterior margin, carapace with a very characteristic pattern of dark blue fields; legs distinctly striped.

All other genera of Palinuridae in the area: antennular flagella shorter than distal segment of antennular peduncle.

**SIZE:**

Maximum: body length 50 cm; average body length 30 to 35 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

From the southern half of the Red Sea arid east coast of Africa (south to Durban) eastward to Pakistan, India and Sri Lanka. Outside the area, the species is found from the Bay of Bengal to southern Japan, the South China Sea, Gulf of Thailand, the Philippines, Indonesia, Solomon Islands. New Caledonia, Gulf of Papua. Fiji and the northwest, north and east coasts of Australia as far south as New South Wales.

Inhabits shallow, sometimes turbid coastal waters in depths of 1 to 8 m: other, near mouths of rivers, but also on coral reefs, on sandy or muddy, sometimes rocky bottoms. Lives solitary or in pairs; seasonal migrations have been observed.

**PRESENT FISHING GROUNDS:**

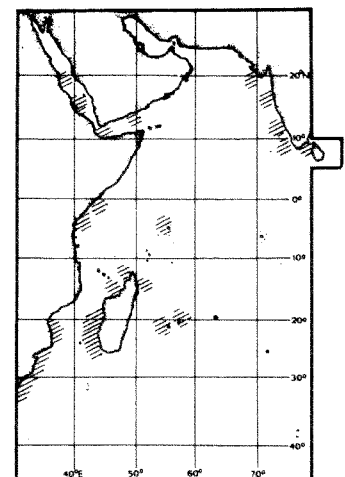
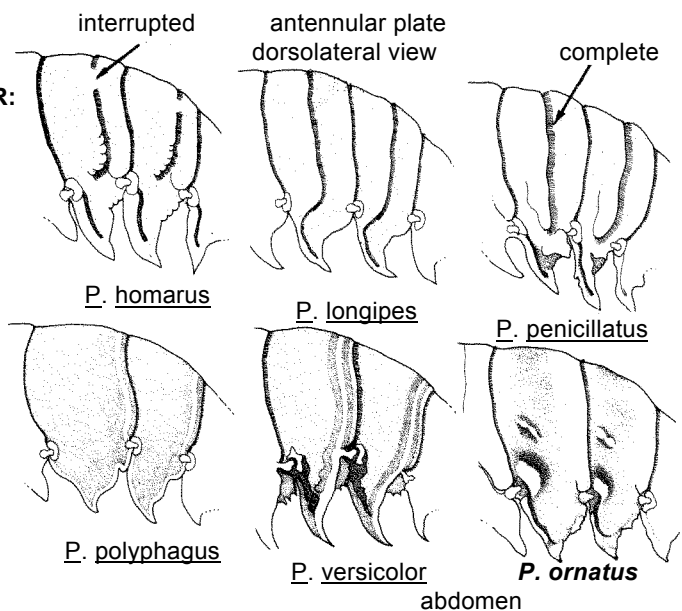
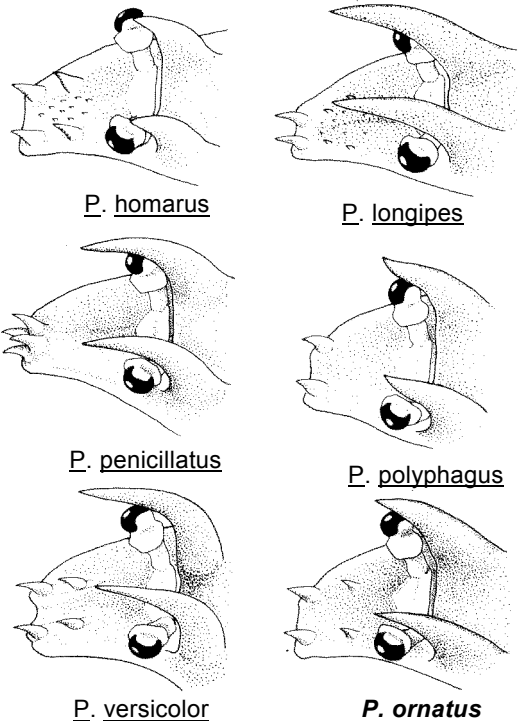
Usually taker, in well protected coastal waters in depths to 2 m. In East Africa it is the dominant species (e.g., in Zanzibar and Kenya; Hall, 1960). It is present but less frequent than other species in the southern Red Sea and the Gulf of Aden. In India it is fished for on both the west and east coasts. In Sri Lanka, it is the dominant spiny lobster in the north but much less frequent or, the other coasts.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

In South Africa it is sometimes taken with "fish kraals". Observations made in Madagascar (Charbonnier & Crosnier, 1961) and Sri Lanka (De Bruin, 1962) showed that the species does not enter traps; it is mostly obtained by divers who spear them or take them by hand: also caught with nets (castnets, handnets).

Used for local consumption or exported as frozen lobster tails.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)Panulirus penicillatus (Olivier, 1791)

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

FAO: En - Pronghorn spiny lobster  
Fr - Langouste fourchette  
Sp - Langosta horquilla

NATIONAL:

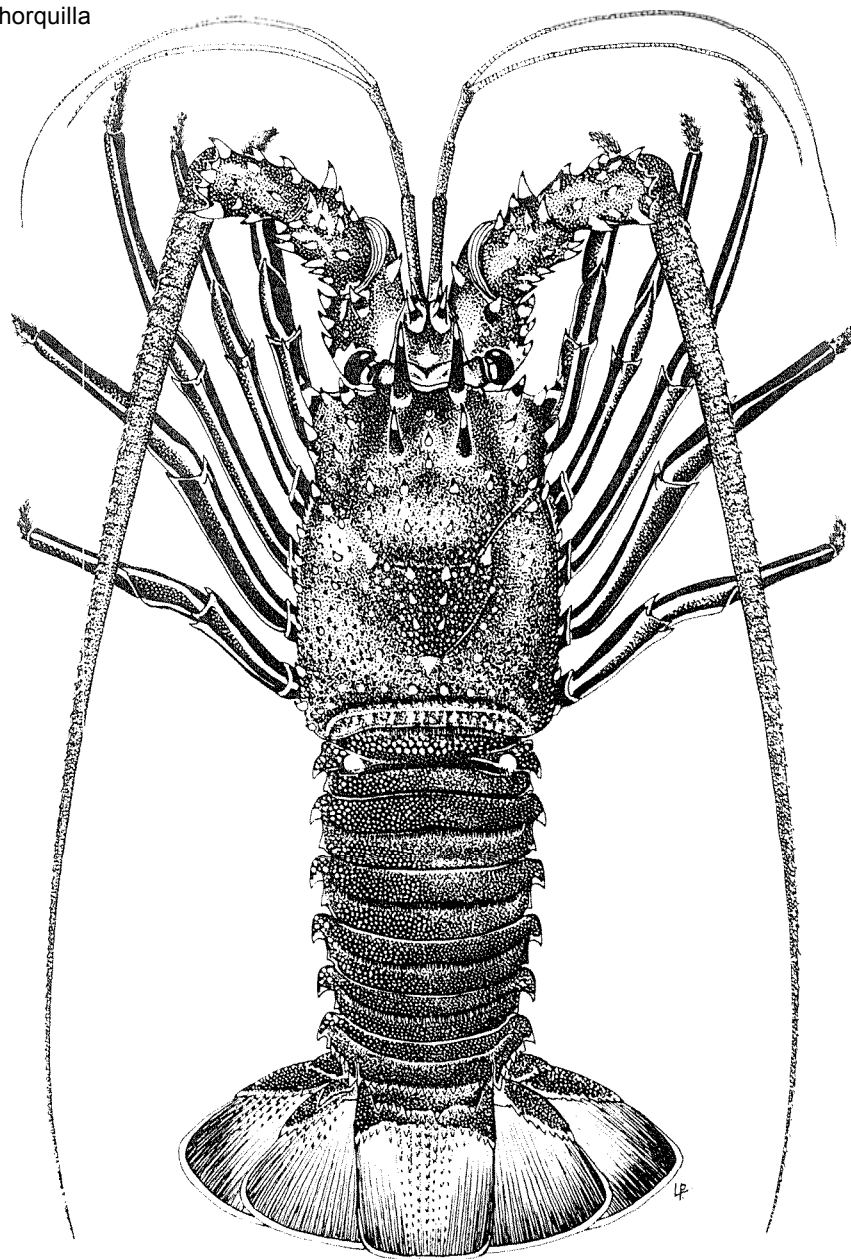
## DISTINCTIVE CHARACTERS:

Carapace rounded, covered with numerous spines and nodules of varying size. Flagella of antennules longer than antennular peduncle, rostrum absent; bases of antennae separated by a broad antennular plate bearing 2 pairs of almost equal principal spines joined at their bases, their tips diverging. Each abdominal segment with a transverse groove not joining the pleural groove. Anterior legs 1 to 4 without pincers.

Colour: ground colour ranging from yellow-green through brown-green to blue-black or dark reddish brown, with many cream spots on upper surface of carapace, and many tiny pale spots on abdomen; antennular flagella uniform green or brown; legs with fine or broader longitudinal white to yellow stripes. Males are usually darker than females in any one area.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

No other spiny lobster has 2 pairs of almost equal spines joined at their bases on the antennular plate. Additional distinguishing characters of other *Panulirus* species are the following:



0 11 cm

P. homarus: abdominal segments with a scalloped anterior margin on transverse groove; antennular plate with 4 spines wide apart; legs with indistinct spots and stripes.

P. longipes longipes: abdominal segments covered all over with medium-sized spots; antennular plate with a single pair of large spines; legs with white spots near the articulations, connected by yellowish stripes.

P. ornatus: abdominal segments smooth dorsally, without transverse grooves, each segment with a broad, dark transverse band and 2 large, white spots on either side, otherwise not spotted; the 2 pairs of spines on antennular plate set wide apart; legs with a distinct pattern of irregular blotches.

P. polyphagus: abdomen without grooves or spots, but with a pale band along posterior margin of each segment; antennular plate with a single pair of anterior spines; legs with indistinct blotches and short stripes.

P. versicolor: abdominal segments without transverse grooves, a white band, bordered by 2 dark bands, along the posterior margins of the segments; antennular plate with 2 pairs of widely separated, large spines; legs striped: carapace with a characteristic pattern of dark blue areas and white bands, bases of antennae pink.

All other genera of Palinuridae in the area: antennular flagella shorter than distal segments of antennular peduncle.

**SIZE:**

Maximum: body length 40 cm; average body length about 30 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

The range of this species occupies a larger area than that of any other spiny lobster. Within Fishing Area 51, it is known from the entire Red Sea, from the east coast of Africa south to Natal (South Africa), Madagascar, La Réunion, Mauritius, the Maldives, India and Sri Lanka. Also found in the Fasten, Indian Ocean, and the Pacific Ocean between 25°N and 25°S, not reaching the mainland coast of America, but rather abundant in off-shore islands like the Galapagos Archipelago, Çocos Island, Clipperton Island and the Revilla-Gigedo group.

Inhabits clear waters not influenced by rivers, which explains its occurrence near so many small islands, and along the arid coasts of the Red Sea, where it is the most frequent spiny lobster.

Lives on hard bottoms in 1 to 4 m depth and is often found in deep caves where surf or strong currents prevail. Nocturnal in its habits, living singly or in pairs.

**PRESENT FISHING GROUNDS:**

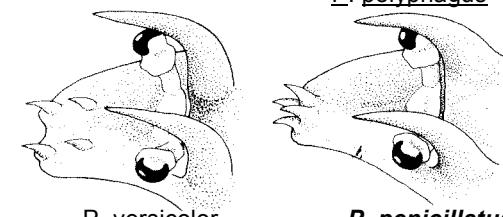
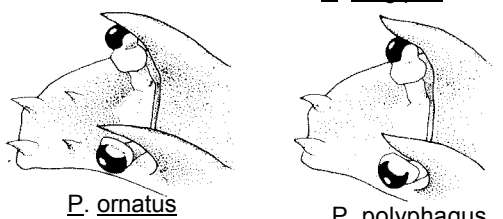
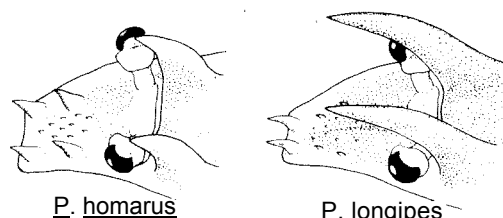
Hunted whenever it occurs. According to Gruvel (1936) this species is the only spiny lobster found in the Egyptian markets.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

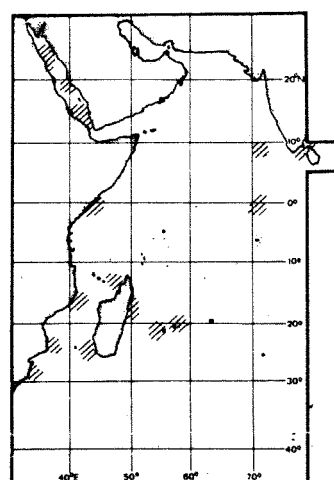
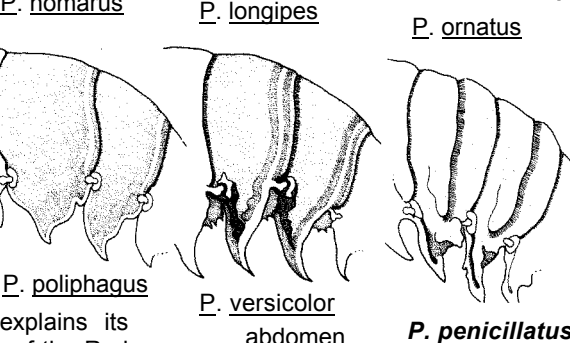
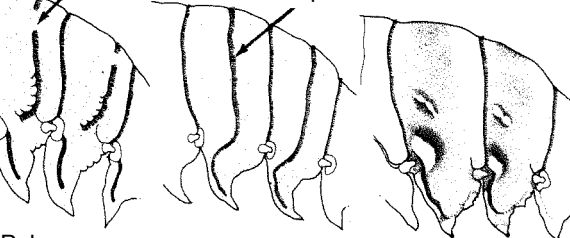
Separate statistics are not reported for this species.

Mostly taken by divers, either by hand or speared; traps seem to be little effective, but trammel nets do catch the species.

Used for local consumption or marketed fresh, cooked or as frozen lobster tails.



P. homarus                      P. longipes  
P. ornatus                      P. polyphagus  
P. versicolor                      P. penicillatus



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)Panulirus polyphagus (Herbst, 1793)OTHER SCIENTIFIC NAMES STILL IN USE : Panulirus fasciatus (Fabricius, 1798)

## VERNACULAR NAMES:

FAO : En - Mud spiny lobster  
Fr - Langouste de vase  
Sp - Langosta fanguera

NATIONAL:

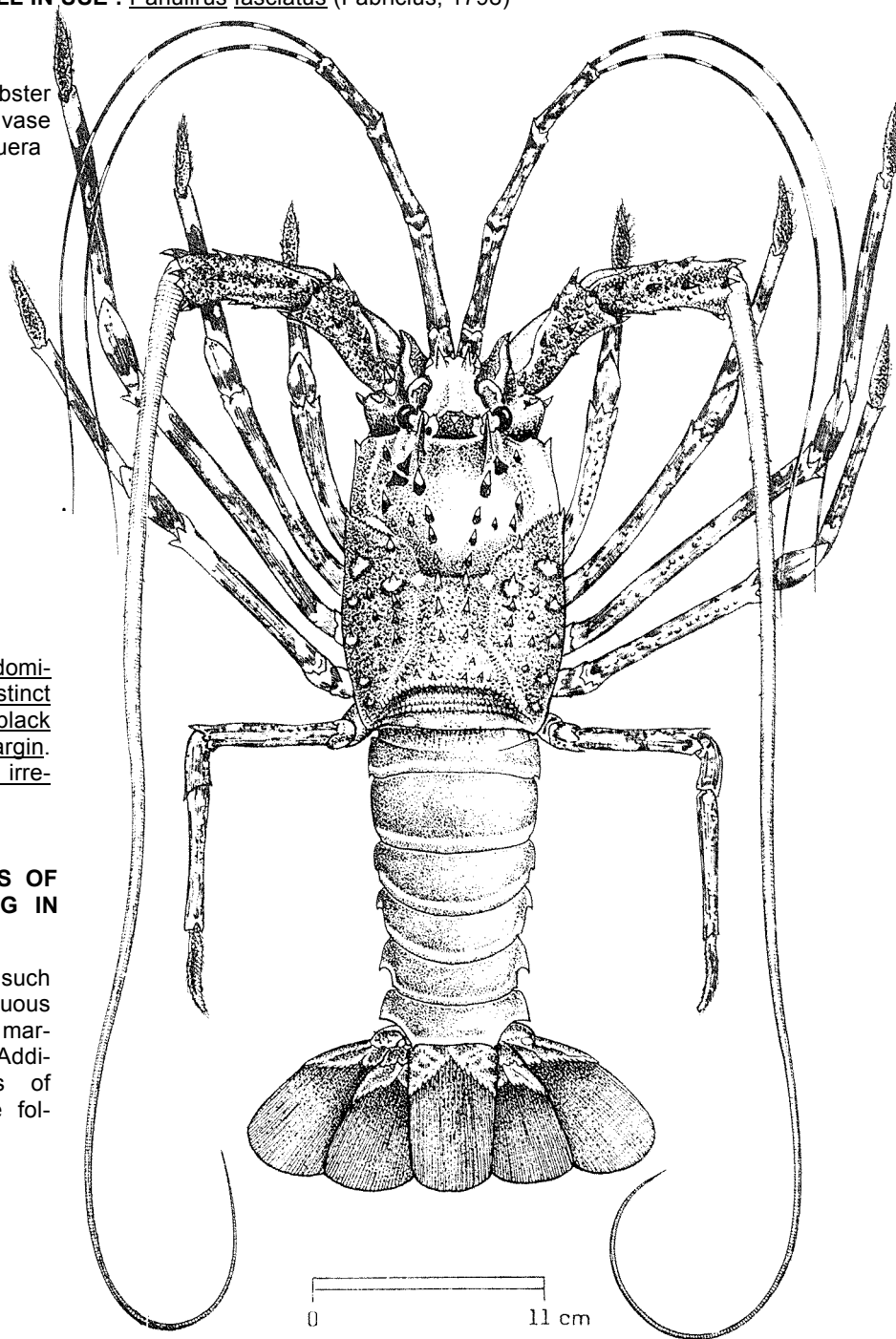
## DISTINCTIVE CHARACTERS :

Carapace rounded, covered with numerous spines and tubercles of different sizes. Flagella of antennules longer than antennular peduncle, rostrum, absent; bases of antennae separated by a broad antennular plate bearing a single pair of principal spines; antennules very long, about 1½ times the total body length; abdominal segments without transverse grooves. Legs: 1 to 4 without pincers.

Colour: dull greenish, abdominal segments each with a distinct transverse band of white (not black-edged) across posterior margin. Antennules broad-banded; legs irregularly blotched creamy white.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

No other spiny lobster has such long antennules nor the conspicuous plain white crossbands near hind margins of abdominal segments. Additional distinguishing characters of other Panulirus species are the following:



Panulirus homarus: abdominal segments with a scalloped anterior margin on transverse groove; antennular plate with 4 spines.

P. longipes: abdominal segments with a distinct transverse groove, upper surface with many medium-sized spots; antennular plate with an anterior pair of large spines and additional spinules; legs with white spots at articulations connected by yellow lines.

P. ornatus: abdominal segments without a white band along posterior margin, but with a broad dark band across middle and 2 white spots on either side; antennular plate with 2 pairs of large spines; legs with very distinct blotches.

P. penicillatus: abdominal segments with distinct transverse grooves and numerous, very small, white spots, but without a pale band along posterior margin; antennular plate with 4 spines joined at their bases; legs striped.

P. versicolor: abdominal segments with a white band along posterior margin, flanked at either side by a dark band; antennular plate with 4 large spines; legs striped; carapace with a characteristic pattern of dark blue areas and white lines; bases of antennae pink

All other genera of Palinuridae in the area: the antennular flagella shorter than the distal segment. of the antennular peduncle.

**SIZE:**

Maximum: body length about 37 cm;  
average body length 20 to 25 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, found along the coasts of Pakistan, India and Sri Lanka. Outside the area, from India east through the Bay of Bengal to Malaysia and Singapore, north through the Gulf of Thailand to Viet Nam, the Philippines and Indonesia; also in northwest Australia and the Gulf of Papua.

Found on mud bottoms, often in turbid water near the mouths of rivers. It has been reported from depths between 3 and 90 m. but is usually found in less than 40 m. Due to a mix-up of names, previous reports on the species from Mauritius and Polynesia need confirmation and should be treated with utmost reserve.

**PRESENT FISHING GROUNDS:**

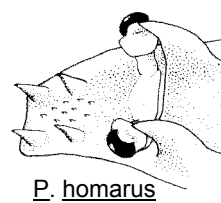
Fished for throughout its range. It was estimated that both in Bombay and at the west coast. of Thailand P. polyphagus accounted for more than 90% of the commercial lobster landings. Also on the east coast of India and in the Gulf of Thailand the species is commercially very valuable.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

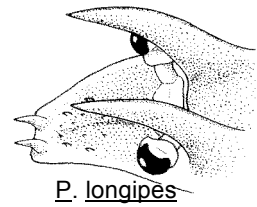
Separate statistics are not reported for this species.

Taken almost exclusively by trawling; sometimes obtained in setnets and only very rarely enters traps; in some areas taken by hoopnets or dropnets.

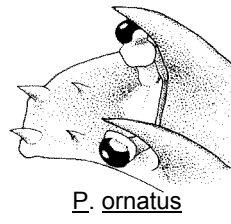
Sold fresh and frozen.



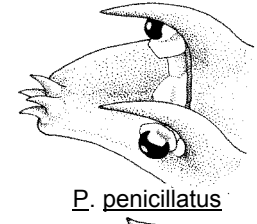
P. homarus



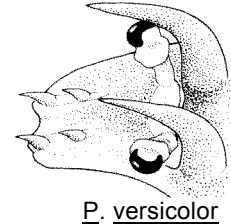
P. longipes



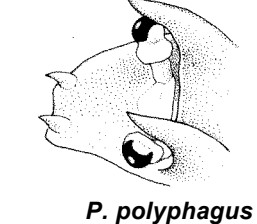
P. ornatus



P. penicillatus



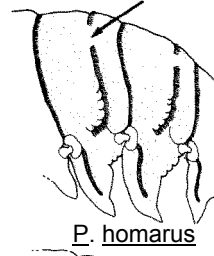
P. versicolor



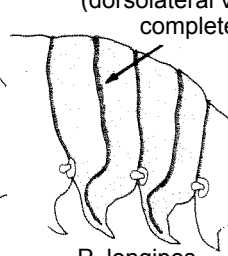
P. polyphagus

interrupter)

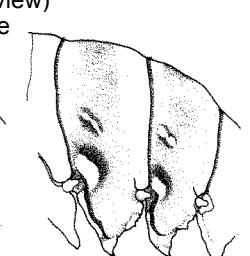
antennular plate (dorsolateral view) complete



P. homarus



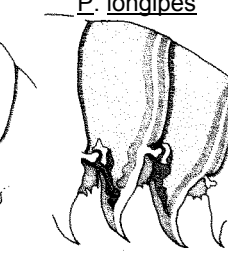
P. longipes



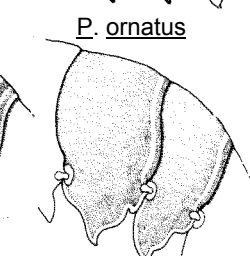
P. ornatus



P. penicillatus

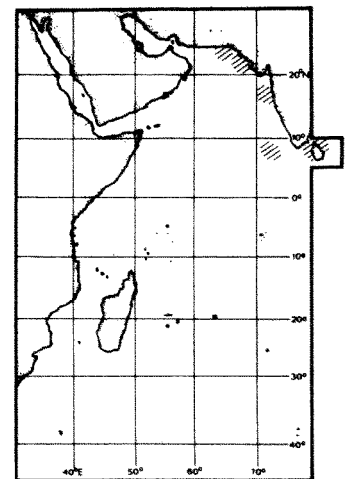


P. versicolor



P. polyphagus

abdomen



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)*Panulirus versicolor* (Latreille, 1804)

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

FAO: En - Painted spiny lobster  
Fr - Langouste barriolée  
Sp - Langosta colorete

NATIONAL:

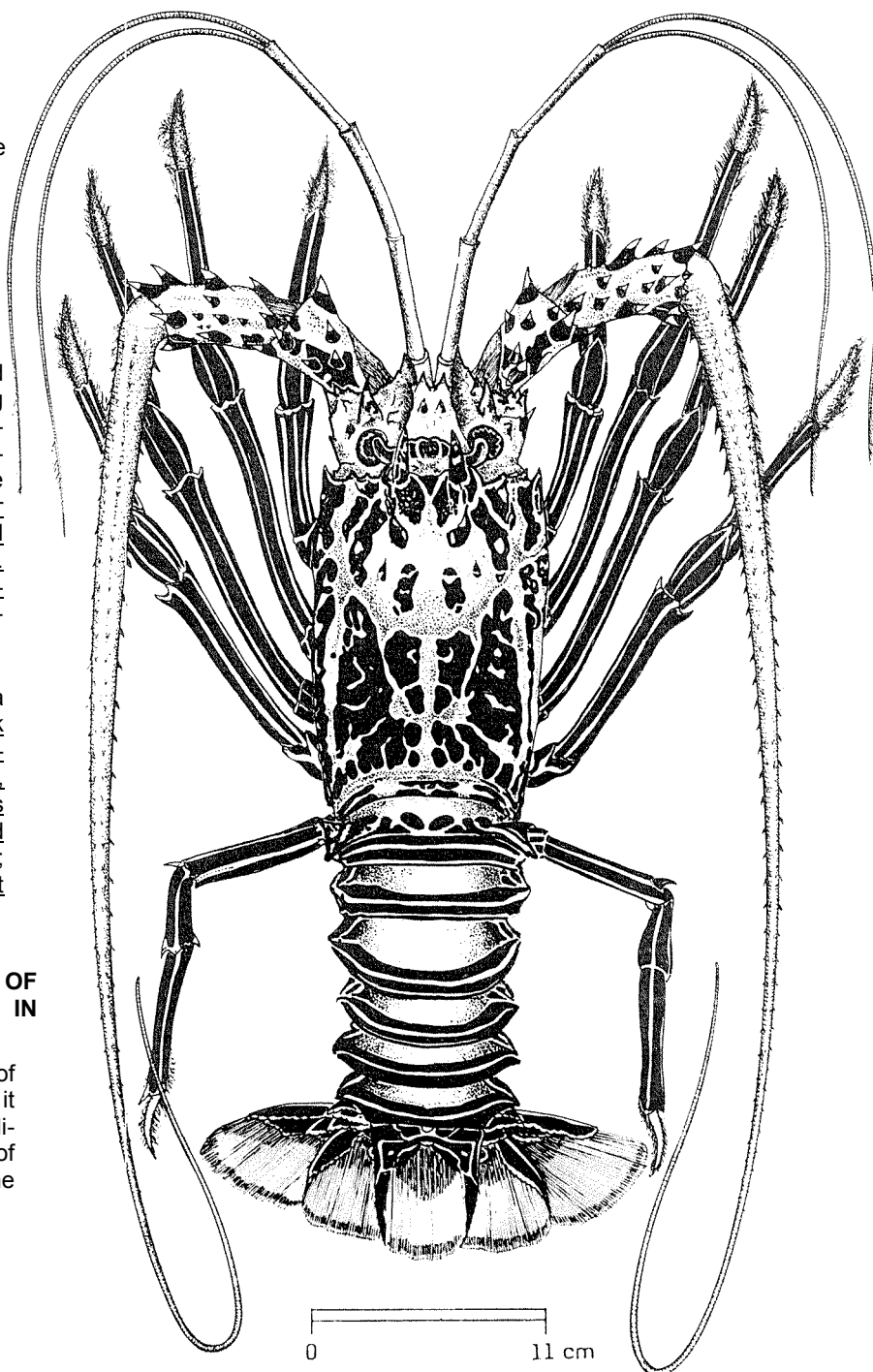
## DISTINCTIVE CHARACTERS :

Carapace rounded, covered with numerous spines of varying size. Flagella of antennules longer than, antennular peduncle, rostrum; absent; bases of antennae separated by a broad antennular plate bearing 2 pairs of unequal and separated principal spines. Abdominal segments without transverse grooves. Legs 1 to 4 without pincers.

Colour: green-blue with a distinctive pattern of blue-black patches and white lines on carapace; a transverse band of white, bordered by 2 black lines, across each abdominal segment; legs and antennules longitudinally striped; bases of antennae bright pink not extending on to antennular plate.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

The bright colour pattern of this species clearly separates it from all other lobsters. Additional distinguishing characters of other *Panulirus* species are the following:



Panulirus homarus: abdominal segments with a transverse groove, the anterior margin of which is scalloped; legs not striped, but with indistinct irregular spots.

P. longipes: abdominal segments with a transverse groove, dorsal surface with medium-sized spots; antennular plate with a single pair of large spines; legs with spots and stripes.

P. ornatus: abdominal segments with a broad brownish band across middle and 2 light spots on either side, no transverse stripe along posterior margin; carapace with vermicular coloration on and around bases of frontal horns, but no pattern of dark blue patches separated by white lines; legs spotted.

P. penicillatus: abdominal segments with a deep transverse groove; antennular plate with 4 large spines joined at their bases.

P. polyphagus: a white band along posterior margin, of abdominal segments, not flanked by dark blue lines; antennular plate with a single pair of spines; legs indistinctly blotched and with short stripes.

All other genera of Palinuridae in the area: antennular flagella shorter than distal segment of antennular peduncle.

**SIZE:**

Maximum: body length to 40 cm; average body length around 30 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Entire Red Sea (from Sinai Peninsula south), the Gulf of Aden, east coast of Africa south to Natal (South Africa), Madagascar, Seychelles, La Réunion, and coasts of Pakistan, India and Sri Lanka. Outside the area, in the Eastern Indian Ocean and the Western Central Pacific, southern Japan, Micronesia, Samoa and northwest and northeast Australia.

The species is found in shallow water (0 to 15 m) in coral reef areas, often on seaward edges of reef plateaux, where the water is usually clear and strongly flowing; also in surf areas. The species hides in daytime in more or less deep caverns and cavities in the rocks. Nocturnal and gregarious.

**PRESENT FISHING GROUNDS:**

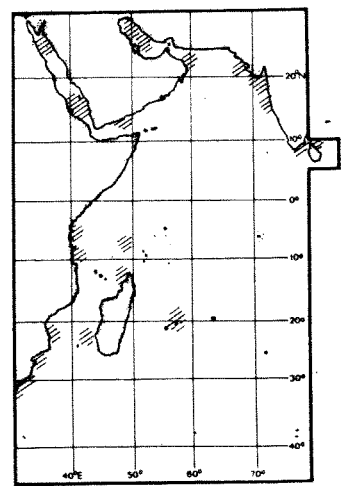
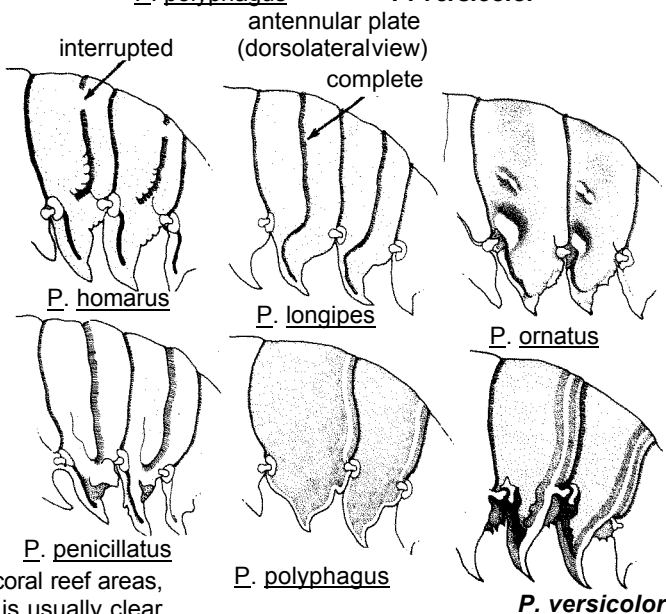
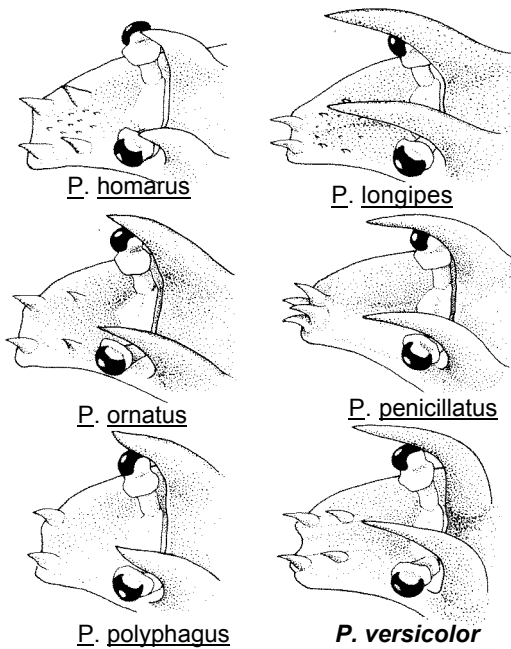
Taken and eaten wherever it occurs. Although it has a wide distributional range it is nowhere very abundant.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Taken by hand or speared (especially at night, when the animals come out of hiding); it does not enter traps.

Not often seen in markets.





## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALINURIDAE

FISHING AREA 51  
(W. Indian Ocean)Puerulus sewelli Ramadan, 1938

OTHER SCIENTIFIC NAMES STILL IN USE: None

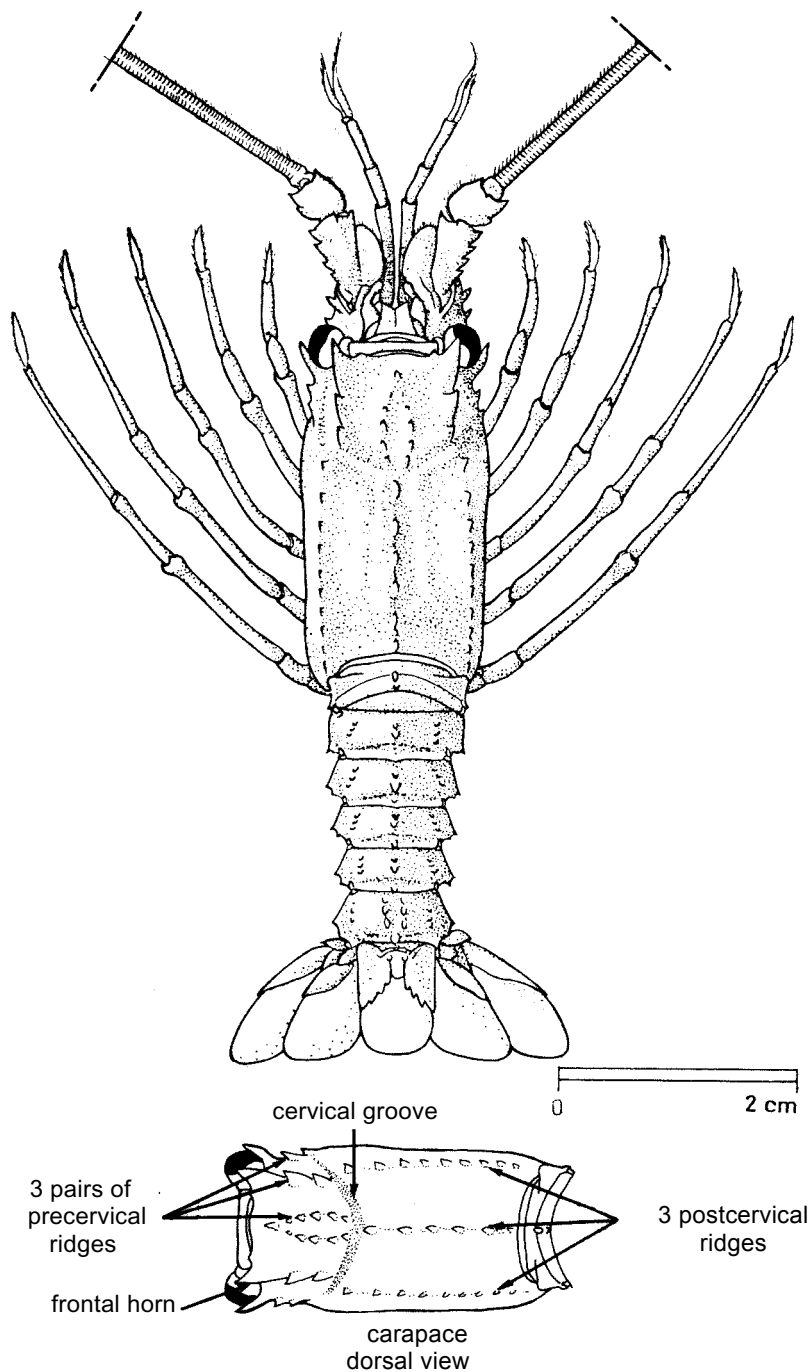
## VERNACULAR NAMES:

FAO : En - Whip lobster  
Fr - Langouste fouet  
Sp - Langosta de fusta

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace angular, with a median and 2 lateral tuberculate longitudinal ridges behind the transverse cervical groove, and 3 pairs of ridges in front (the first pair submedian, converging anteriorly and posteriorly; the second originating behind the frontal horns and the third behind the antennal bases); median postcervical ridge with 8 small teeth (5 postcervical followed by 3 intestinal); frontal horns compressed and sharply pointed, with a single, small, sharp tooth on basal part of anterior margin; surface of carapace covered with scattered granules, and larger tubercles or teeth on the ridges. Antennules slightly over reaching antennal peduncle, with 2 short flagella, which are about as long as distal segment of antennular peduncle; antennular plate present, without spines, forming stridulating organs with the antennal peduncle; basal part of antennal peduncle with a large, rounded, ciliated lobe on inner margin. Tail powerful, segments 1 to 3 with a low, tuberculate median longitudinal ridge, 6th segment with 2 submedian, tuberculate ridges. Surface of abdominal segments with some sculpturation, and with at most 2 transverse grooves; pleura ending in 1 or 2 sharp teeth. Legs 1 to 4 without pincers.





## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Puerulus angulatus (off Mozambique and Natal, at 280 to 320 m depth, on soft mud with some sand): median keel of carapace with 5 teeth (3 postcervical, 2 intestinal); body spines distinct and sharp; 3 spines behind supraorbital spine; antennal flagella banded red and white.

P. carinatus (off Mozambique and Natal, some substrate and depth as P. angulatus): median keel of carapace with 5 to 7 teeth (3 postcervical, 2 to 4 intestinal); fifth pair of legs of male with chelae; antennal flagella plain red.

Linuparus somniosus: abdomen with 2 large, often spinous median tubercles on each of segments 2 to 5; pleura of segments 2 and 3 with 3 lateral teeth; the 2 orbital horns form together a wide median process between the eyes. No antennular plate or stridulating organ.

None of the other lobster species of this family have the 6 precervical and 3 postcervical ridges on the carapace typical of Puerulus.

### SIZE:

Maximum: total body length about 20 cm; maximum carapace length about 8 cm; average total body length about 15 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Recorded from off Somalia, the Gulf of Aden, Pakistan, southwest India and the Gulf of Mannar. Known from depths between 180 and 1 300 m, but most commonly found from 180 to 300 m, on hard bottoms of coarse sand, mud or shells.

### PRESENT FISHING GROUNDS:

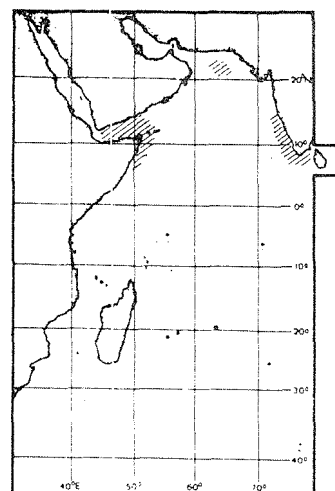
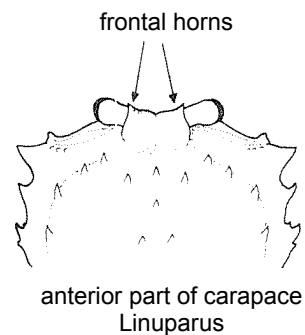
From 1974 to 1977 the species was commercially fished for off the east coast of Somalia by a Soviet-Somali joint venture fishing company, which was dissolved in 1977 (Venema, 1978, IOFC/DEV/78/432:110). In the Gulf of Aden, in experimental trawling, average catches of 10 to 129 kg/h were made and the maximum sustainable yield was estimated to be about 200 tons annually (Druzhinin, 1973, FI:SF/DP 9/12; PDY 64/501/7:11,34,40). Rich grounds are also found off southwest India, where the lobster is potentially commercial and where catches of 180 kg/h were made. The annual sustainable yield in the southwest Indian area is estimated at 6 700 tons. The best catches were made in depths between about 180 and 300 m. The distribution of the whip lobster seems to be spotty within some areas.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Taken by deep-sea trawls.

The animals are beheaded, the tails are deep-frozen either shell-on (after removal of telson, pleopods and spines and cleaning in hypochloride) or the shell is removed and the meat washed, packed and deep-frozen (Oommen & Philip, 1974, Indian Journ.Fisher., 21(2): 369-85).



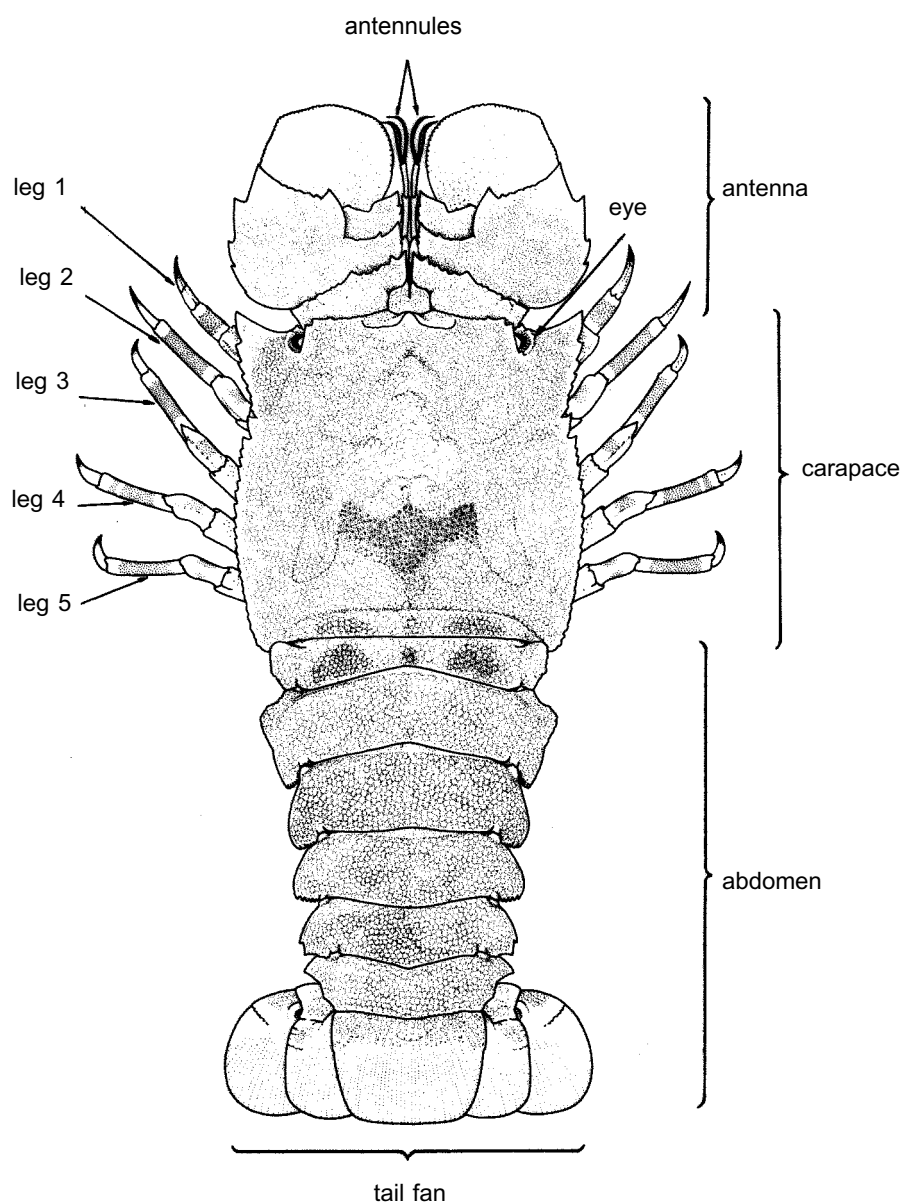
## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

## SCYLLARIDAE

## Slipper lobsters

Small to large crustaceans (total length between 2 and 40 cm). Body more distinctly flattened than in any other group of lobsters. Carapace usually granular, sometimes with teeth, spines and ridges; eyes movable but recessed into anterior margin of carapace. Antennae short and broad, plate-like, lacking flagella; antennules short and slender, with 2 short flagella. Tail broad and powerful, with a well developed tail fan. All legs without pincers (except the fifth leg of the female which in most species ends in a small pincer); all legs of about same size.



Colour: usually drab, brownish in various shades; central part of first abdominal segment often with a characteristic pattern of brightly coloured large spots.

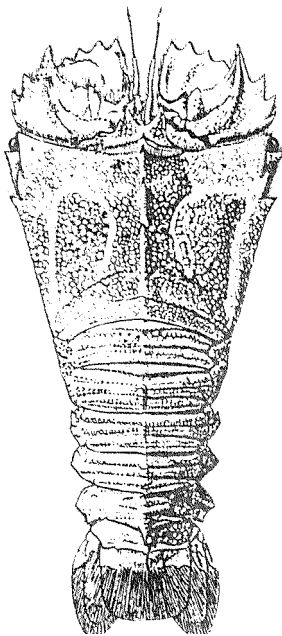
This family comprises 5 genera and 18 species in Fishing Area 51, ranging in size from 2 to 40 cm in total length, and occurring from the coastline to at least 330 m depth. All slipper lobsters are benthic species, many of them occurring on level bottoms (sand, mud or rock) but some preferring reef areas. An established fishery exists for one of the Western Indian Ocean species, viz., Thenus orientalis. Some of the species - especially the larger Scyllarides - are fished locally or caught incidental to other fishing operations, and may be sporadically seen in local markets.

**SIMILAR FAMILIES OCCURRING IN THE AREA:**

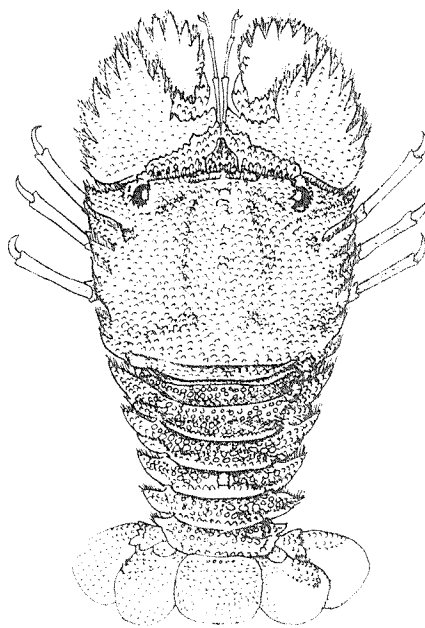
No other family of lobsters has such a flattened body or plate-like antennae without flagella.

**KEY TO GENERA OCCURRING IN THE AREA:**

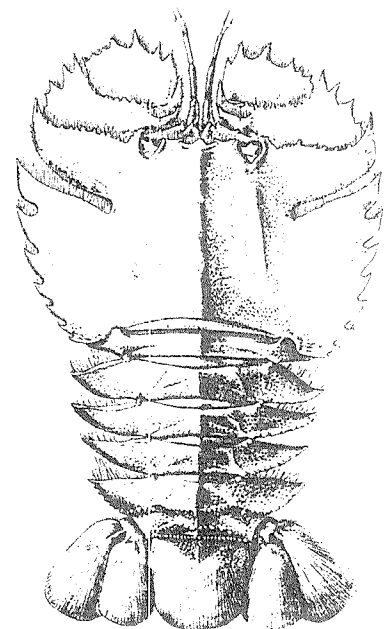
- 1a. Eyes placed at the anterolateral corners of carapace; carapace flat, triangular, narrowing posteriorly; posterior lateral margin without teeth (Fig.1)..... Thenus
- 1b. Eyes placed on the anterior margin of carapace at considerable distance from the anterolateral corners; carapace quadrangular, not strongly narrowing posteriorly
  - 2a. Carapace much wider than long, its sides thin; lateral margin of carapace with a very deep incision (occupying about 1/4 of the carapace width) in the anterior part; behind this incision the margin is dentate
    - 3a. Body covered rather uniformly with high granules and short stiff erect hairs, giving the animal a rough, hairy appearance; distance between the eyes much larger than that between each eye and the closest anterolateral angle (Fig.2) ..... Parribacus
    - 3b. Body smooth or with low rounded tubercles, naked or with inconspicuous appressed hairs, giving the impression of a naked smooth animal; distance between the 2 eyes shorter than that between each eye and the nearest anterolateral angle of carapace (Fig.3) ..... Ibacus



Thenus Fig.1



Parribacus Fig.2



Ibacus Fig.3

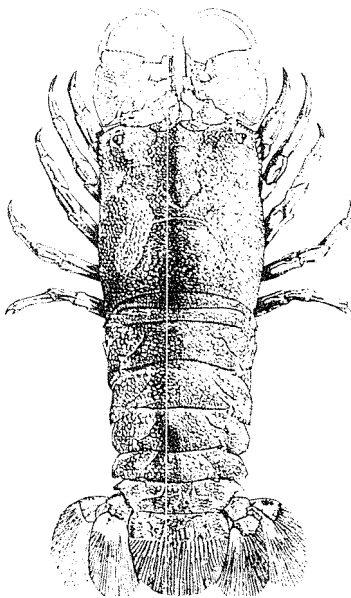
2b. Carapace as long as or longer than broad, its sides broadly rounded, not thin; lateral margin in the anterior part with at most a shallow inconspicuous indentation; teeth on lateral margin of carapace small or practically absent

4a. Large lobsters (up to 40 cm total length); first segment of abdomen smooth, without transverse groove; surface of following segments uniformly granulated, without sculpturation; distal margin of last segment of antenna finely crenulated (Fig.4) ..... Scyllarides

4b. Medium- or small-sized lobsters (total length always less than 20 cm); first segment of abdomen usually with distinct transverse groove; last segment of antenna with few large or many small teeth; abdominal segments with transverse grooves or arborescent markings

5a. Medium-sized lobsters (adults more than 12 cm total length); margin of distal segment of antenna with numerous (more than 20) small teeth; abdominal segments with elevated crenulated areas separated by hairy wide grooves ..... Arctides

5b. Small-sized lobsters (adults less than 10 cm in total length); margin of distal segment of antenna with few (less than 10) distinct wide teeth; abdominal segments either with a transverse groove or with arborescent narrow grooves, without elevated crenulated structures (Fig.5) ..... Scyllarus



Scyllarides Fig.4



Scyllarus Fig.5

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Arctides regalis Holthuis, 1963

Ibacus novemdentatus Gibbes, 1850

SCYLL Ib 1

Parribacus antarcticus (Lund, 1793)

SCYLL Par 1

Scyllarides elizabethae (Ortmann, 1894)

SCYLL Scyld 5

Scyllarides haanii (De Haan, 1841)

Scyllarides squamosis (H. Milne Edwards, 1837)

SCYLL Scyld 6

Scyllarides tridaenophaga Holthuis, 1967

<u>Scyllarus</u> <u>batei</u> Holthuis, 1946	SCYLL Scylr 2
<u>Scyllarus</u> <u>cultrifer</u> meridionalis Holthuis, 1960	
<u>Scyllarus</u> <u>gibberosus</u> (De Man, 1905)	
<u>Scyllarus</u> <u>lewinsohni</u> Holthuis, 1967	
<u>Scyllarus</u> <u>martensii</u> Pfeffer, 1881	
<u>Scyllarus</u> <u>ornatus</u> Holthuis, 1960	
<u>Scyllarus</u> <u>pumilus</u> Nobili, 1905	
<u>Scyllarus</u> <u>rubens</u> Alcock & Anderson, 1894	
<u>Scyllarus</u> <u>rugosus</u> H. Milne Edwards, 1837	
<u>Scyllarus</u> <u>sordidus</u> (Stimpson, 1860)	
<u>Thenus</u> <u>orientalis</u> (Lund, 1793)	SCYLL Then 1

Prepared by L.B.Holthus, Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands. Partly based on Species Identification Sheets for the Western Central Atlantic (Fishing Area 31) prepared by R.B. Manning, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington D.C. 20560, USA

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SCYLLARIDAE

FISHING AREA 51  
(W. Indian Ocean)*Ibacus novemdentatus* Gibbes, 1850

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

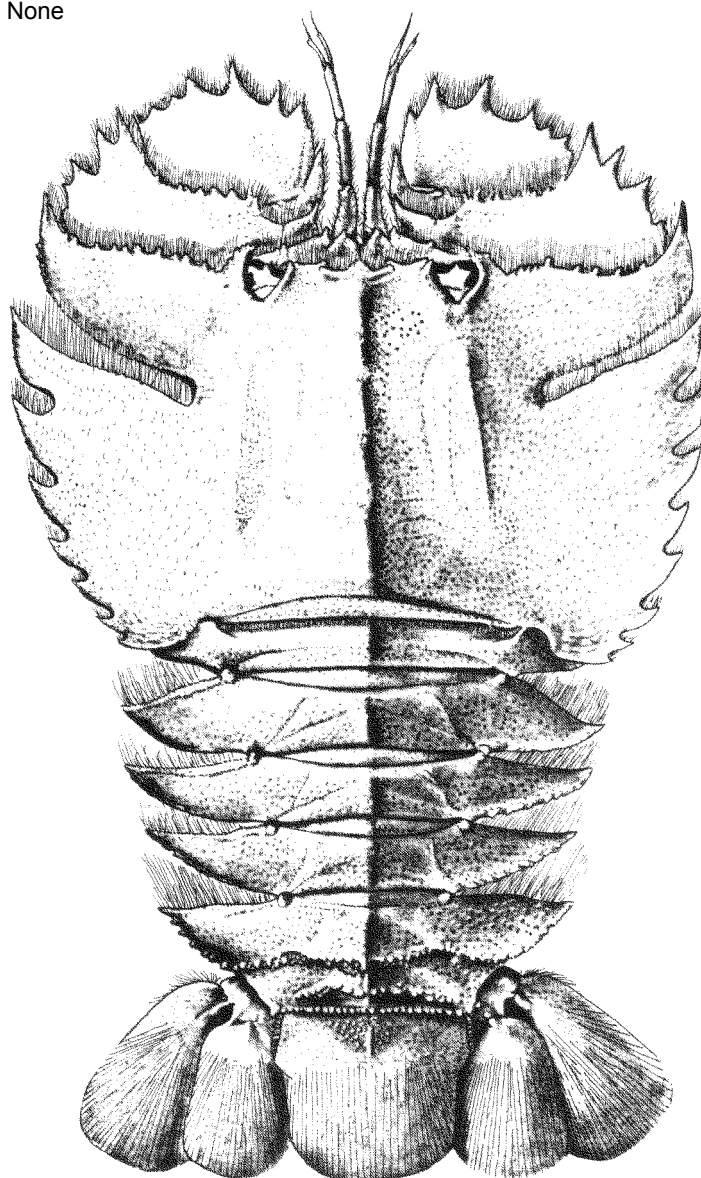
FAO : En - Smooth fan lobster  
Fr - Cigale glabre  
Sp - Cigarro liso

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body very strongly flattened, carapace broader than long, upper surface coarsely pitted, otherwise smooth, without tubercles. Orbits on anterior margin of carapace closer to median line of body than to anterolateral angles. Upper surface with two straight diverging ridges, starting somewhat behind each orbit. Lateral margins of carapace flattened, with a deep (more than 1/4 of width of carapace) incision (cervical incision in anterior part); behind this incision 7 or 8 distinct teeth; anterior margin of incision gradually merging into anterolateral tooth. Antennae broad, without flagella, the two large segments both with several distinct teeth. Antennules short and slender. Third maxilliped swollen and of a yellowish colour. Tail broad, powerful, with a well developed tailfan. All legs (except fifth leg of female) without pincers, none of them enlarged.

Colour: pale yellowish orange with scattered red stipples.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of Scyllaridae: species of Arctides, Scyllarides, Scyllarus and Thenus do not show the deep cervical incision, they have at most a shallow cervical indentation there which occupies less than 1/10 of the width of the carapace. Parribacus has the dorsal surface of the body covered with numerous small tubercles and stiff short hairs. Thenus has the carapace strongly narrowing posteriorly, and the eyes are placed at the anterolateral angles of the carapace.

### SIZE:

Maximum: 16.5 cm total length (male), 18.5 cm (female); maximum carapace length 7 cm (male), 8 cm (female).

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, known from East Africa (Kenya to Natal). Elsewhere recorded from the Mascarene Ridge banks, Viet Nam, South China Sea, Taiwan Island, Korea and Japan.

Occurs at depths between 40 and 360 m on a substrate of fine sediments (fine sand, muddy sand, sandy mud, etc.).

### PRESENT FISHING GROUNDS:

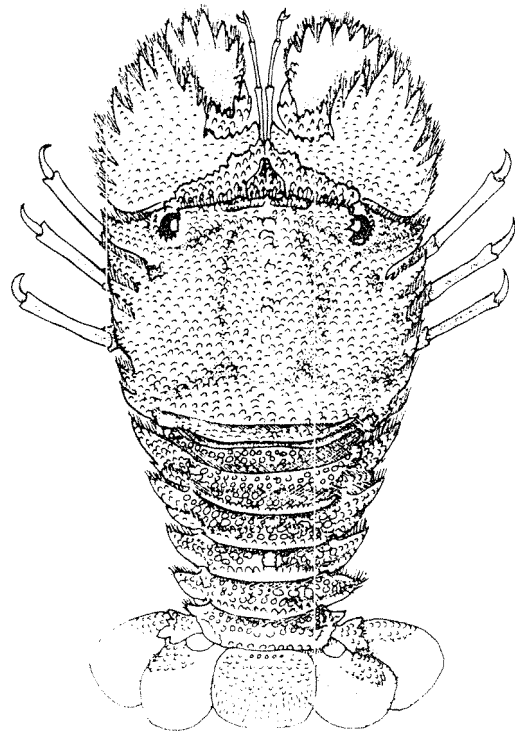
There is no organized fishery at present; although the species has, at one occasion at least, been found on a local market (at Pusan, see Kim, 1973, Illustr. Encycl. Fauna Flora Korea, 14:336-400). Ivanov & Krylov (1980, Crustaceana, 38(3):287) mentioned the species to be very common in trawl catches made on the East African continental shelf: the numbers obtained were sometimes as high as 22.6 kg/h.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

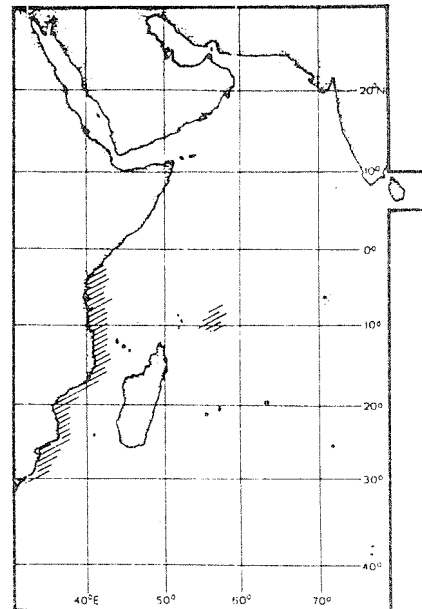
Separate statistics are not reported for this species.

It is mostly taken by trawlers as an admixture to the main catch.

Marketed fresh locally.



Parribacus  
(dorsal view)



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SCYLLARIDAE

FISHING AREA 51  
(W. Indian Ocean)Parribacus antarcticus (Lund, 1793)OTHER SCIENTIFIC NAMES STILL IN USE : Parribacus ursusmajor (Herbst, 1793)

## VERNACULAR NAMES:

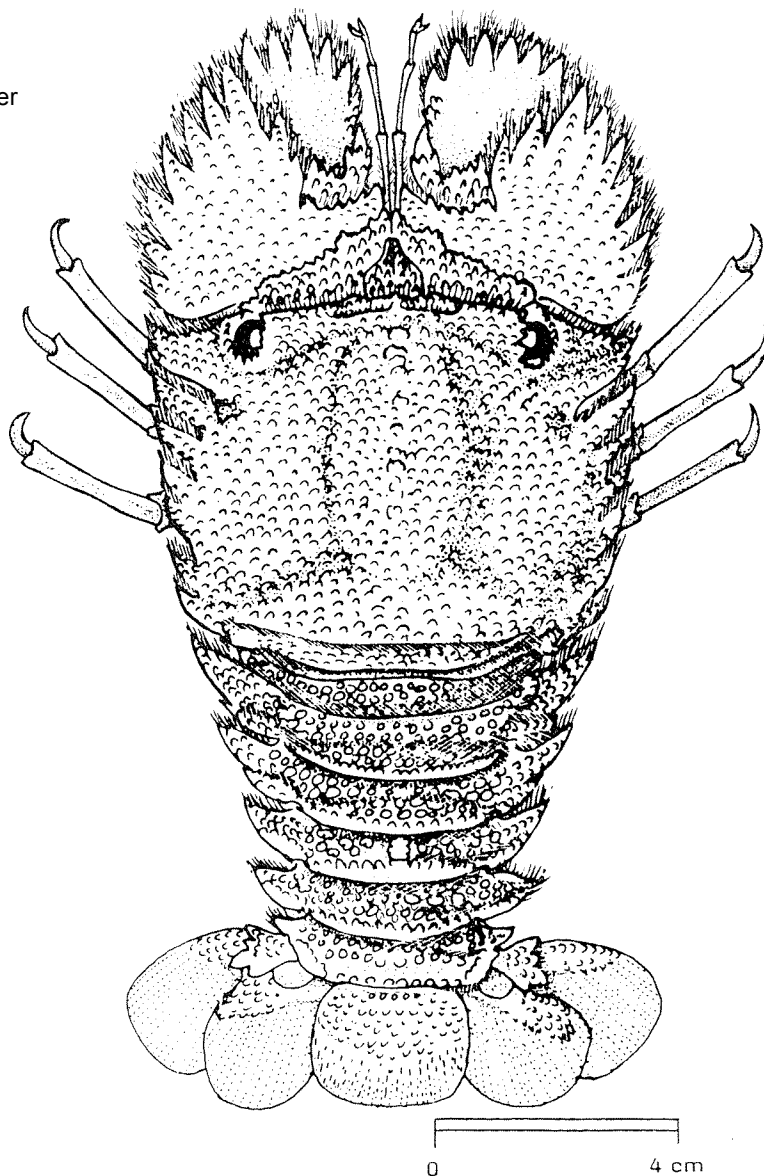
FAO : En - Sculptured slipper lobster  
Fr - Cigale savate  
Sp - Cigarro chino

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body very strongly flattened, with pebblelike and scalelike sculpture on surface. Carapace broader than long, its sides very thin and cut into large flattened, toothlike, triangular projections. Antennae short and broad, scalelike, lacking flagella, their anterior margins cut into moderately large teeth; antennules short and slender. Tail broad, powerful, with a well developed fan. All legs (except fifth leg of female) without pincers, none of them enlarged.

Colour: dorsal surface tan, mottled with brown and red, but without enlarged red spots on first abdominal segment.





## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

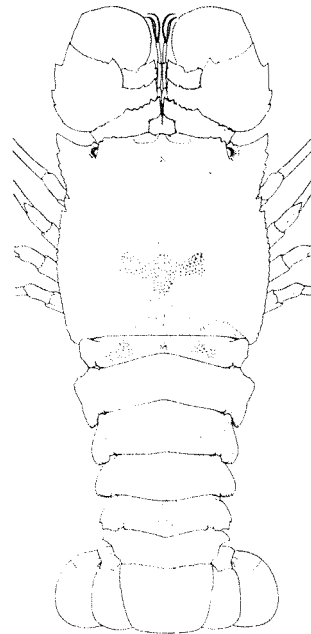
Ibacus novemdentatus: surface of carapace smooth, but pitted, without tubercles; number of teeth on the antennal segments smaller.

Thenus orientalis: no teeth on posterior half of carapace; eyes placed at anterolateral angles of carapace.

Scyllarus and Scyllarides species: carapace usually longer than broad and less flattened, its sides not very thin and either smooth or denticulate (but without large, triangular projections). In addition, adults of Scyllarides species are much larger, with lateral margins of carapace and anterior margins of antennae smooth or nearly so, and the first abdominal segments are marked with conspicuous large red spots; adults of Scyllarus species are much smaller and have a raised, irregular ridge on midline of carapace.

### SIZE:

Maximum: about 20 cm total length.



Scyllarides elisabethae



Scyllarus batei

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, reported from Kenya and Tanzania, Durban (South Africa), Réunion, Mauritius, Chagos Archipelago and Sri Lanka. Also present in the Eastern Indian Ocean, the Western Central Pacific and the Western Central Atlantic.

Habits not well known, the species apparently not being very abundant; reported to live in water deeper than 10 m.

### PRESENT FISHING GROUNDS:

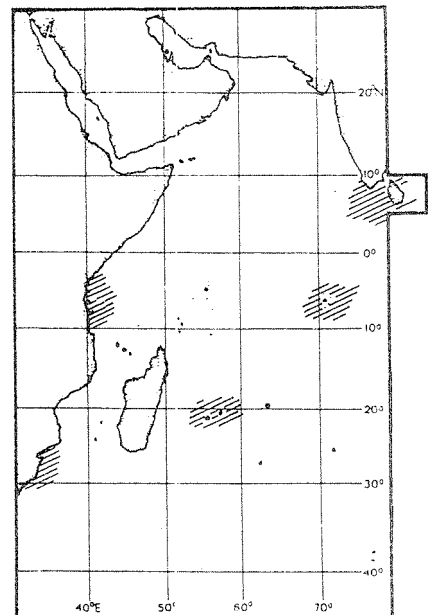
There is no organized fishery at present; like the species of Scyllarides, it is probably caught incidental to fisheries for spiny lobsters.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mainly by hand, with dipnets, spears, or with traps, often taken when torch fishing.

Used for private consumption, or marketed locally.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SCYLLARIDAE

FISHING AREA 51  
(W. Indian Ocean)*Scyllarides elisabethae* (Ortmann, 1894)

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

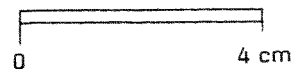
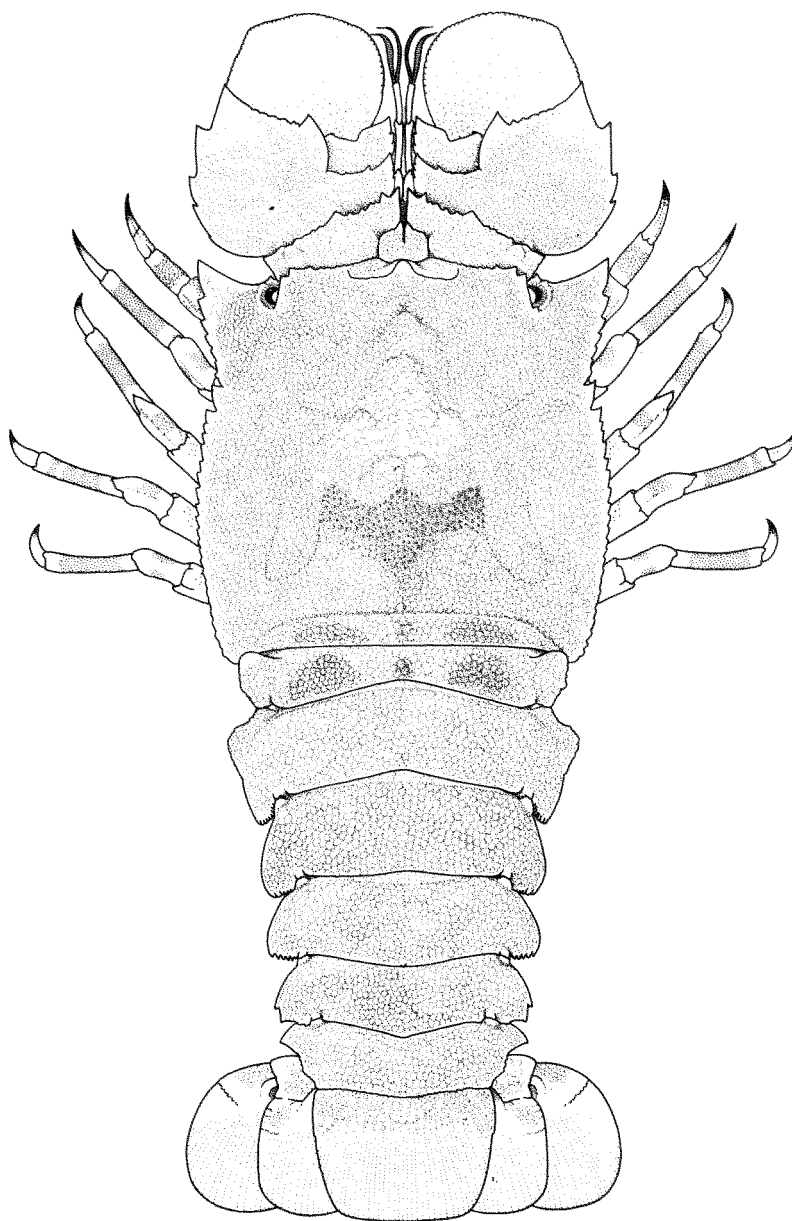
FAO : En - Cape locust lobster  
Fr - Cigale du Cap  
Sp - Cigarro del Cabo

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace massive, about as wide as long; anterolateral margins produced and ending in a sharp tooth, distinctly constricted at level of cervical incision, so that the lateral margin shows a broadly triangular indentation in anterior half. Eyes placed on the anterior margin of the carapace, slightly closer to the anterolateral angle than to the median line of the carapace. Upper surface of body densely covered with low small tubercles and very short hairs; shallow and wide grooves present on carapace. Abdominal segments slightly elevated in the middorsal line, but without a distinct carina and without pronounced median humps on third and fourth segments. Anterior margin of pleuron of second abdominal segment strongly curved, ending in a strong, posteriorly directed tooth, but without anterior teeth, posterior margin with teeth that become smaller proximally. Antennae transformed into paddle-shaped plates; margin of distal segment finely crenulate, the other large segment with 3 or 4 blunt teeth on outer margin, anterolateral angle sharply pointed.

Colour: upper surface of carapace bright red with grey areas, under surface yellowish. Median dorsal area of first abdominal segment with 3 to 5 red spots, the median of which is the smallest. Legs with a distinct, sharply defined, red band on each of the distal four segments. Antennules red distally.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

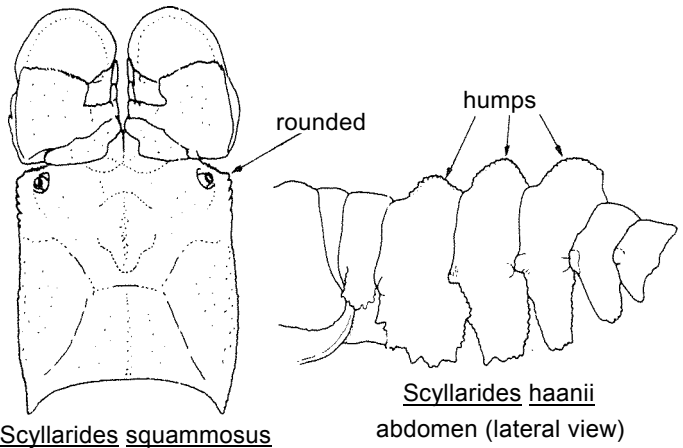
Other Scyllarides species: anterolateral angle of the carapace not produced and not sharply pointed. Also the lateral margin of the carapace is almost straight in the anterior half. S. squamosus has large teeth on anterior margin of second abdominal pleura and has the median red spot on first abdominal segment larger than the laterals. S. haanii has a large median hump on the third and fourth abdominal segments.

Scyllarus species: much smaller; last segment of antenna with few large marginal teeth, rather than being minutely crenulate.

Ibacus and Parribacus species: a deep and narrow cervical incision, which measures about 1/4 of the width of the carapace.

Arctides regalis: abdomen with conspicuous elevated, crenulated, smooth-topped structures.

Thenus orientalis: carapace distinctly narrowing posteriorly, and eyes placed at anterolateral angles of carapace.



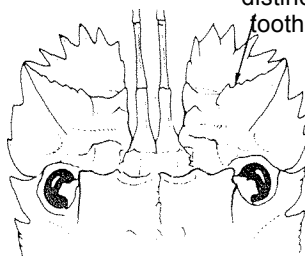
Scyllarides squamosus

Scyllarides haanii  
abdomen (lateral view)

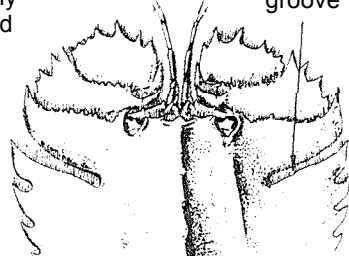
anterior part  
(dorsal view)

this margin  
distinctly  
toothed

cervical  
groove



Scyllarus  
anterior part. of body  
(dorsal view)



Ibacus  
anterior part of body  
(dorsal view)

**SIZE:**

Maximum: over 20 cm total length; carapace length to about 9 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Restricted to the southeast coast of Africa, from Inhambarie (Mozambique) (about 24°S) to Cape Agulhas (South Africa) (34°50'S).

Occurs in depths between 37 and 380 m, on a bottom of fine sediments: mud, sandy mud, muddy sand, or fine sand. The species seems to dig in the mud, being described as "digger lobster" or "mud burrowing crustacean".

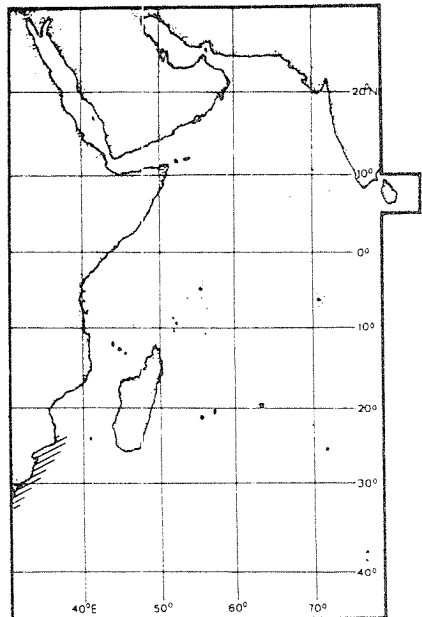
**PRESENT FISHING GROUNDS:**

There seems to be no special fishery for the species, although Von Bonde (1930, Rep.Fisheries mar.biol.Survey, S.Africa, 8:5) remarked that it "occurs off the coast of Natal in such numbers as to be of economic importance".

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Seems to be occasionally taken by trawlers. There is a closed season for it in South Africa from 1 July to 31 October; soft-shelled specimens and females carrying eggs are completely protected.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SCYLLARIDAE

FISHING AREA 51  
(W. Indian Ocean)*Scyllarides squammosus* (H.Milne Edwards, 1837)

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

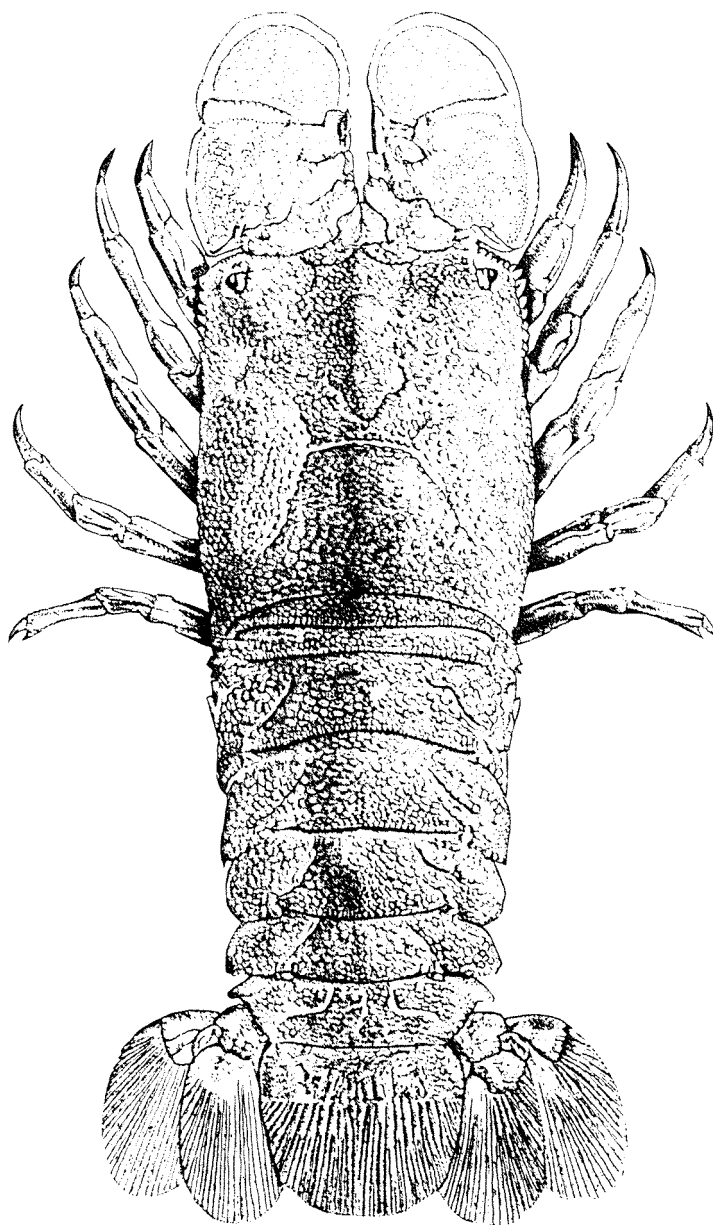
FAO : Erg - Blunt locust lobster  
Fr - Cigale grenue  
Sp - Cigarro nato

NATIONAL

## DISTINCTIVE CHARACTERS:

Carapace massive, rectangular, slightly longer than broad, with the anterolateral angles bluntly rounded or rectangular, not produced. Lateral margins in the anterior part about straight, the cervical incision hardly noticeable. Eyes placed on anterior margin of carapace, slightly closer to anterolateral angle than to midline of carapace. Upper surface of body densely covered by many small blunt tubercles and very short hairs; carapace with some shallow, wide grooves. Abdominal segments slightly elevated in the midline but without distinct median carina; no median humps on third and fourth abdominal segments, pleuron of second abdominal segment with large teeth on anterior and lateral margins, posterior margin without large basal tooth. Antennae transformed into paddle-shaped plates; margin of distal plate minutely crenulate, without teeth, anterolateral angle rounded; the other large plate without large teeth on outer margin, teeth on inner margin rather small, anterolateral angle blunt.

Colour: body reddish, marbled with brown or grey. First abdominal segment bearing dorsally 3 large red spots, the median of which is up to twice as wide as the other two; the spots are often somewhat fused anteriorly, but always distinct posteriorly. Legs not distinctly banded. Antennules brownish.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Scyllarides elisabethae: carapace distinctly constricted in the anterior half near the cervical incision, which is very distinct; anterolateral angles sharply produced; second abdominal pleura without large teeth on anterior margin; legs with distinct sharp red bands.

Scyllarides haanii and S. tridacnophaga: posterior margin of second abdominal pleuron with a large basal tooth above which the margin is concave and unarmed. Furthermore, a large median hump on both the third and fourth abdominal segments in S. haanii and dorsal spots on the first abdominal segment in S. tridacnophaga placed widely apart and of about the same size.

Scyllarus species: much smaller; last segment of antenna with few large marginal teeth, rather than being minutely crenulate.

Ibacus and Parribacus species: a deep and narrow cervical incision, which measures about 1/4 of carapace width.

Thenus orientalis: carapace strongly narrowing posteriorly, and eyes placed at anterolateral angles of carapace.

Arctides regalis: upper surface of abdomen not uniformly granular, but with elevated, crenulated, smoothly topped structures.

**SIZE:**

Maximum: carapace length of males about 10 cm, of females about 15 cm. Maximum reported total length about 40 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Only scattered distributional records are available for this species. Within the area, it is known from Kenya and Tanzania, Gulf of Aden, Réunion, Mauritius and Rodrigues Islands. Elsewhere, from Japan, the Hawaiian Archipelago, New Caledonia and the Loyalty Islands.

Lives at depths between 0 and 80 m (evidently most common between 20 and 50 m) on reefs and in rocky areas, hiding in daytime in crevices in the rocks.

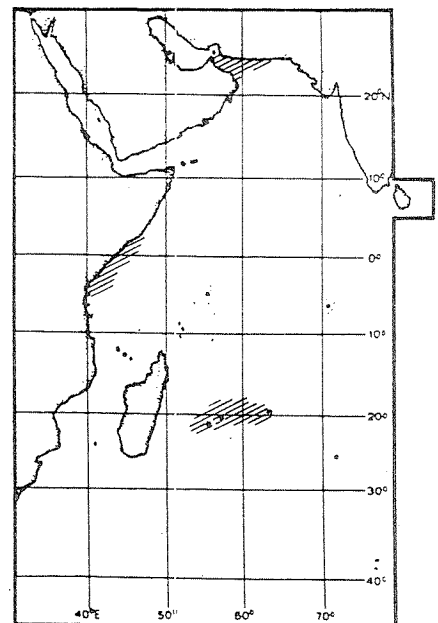
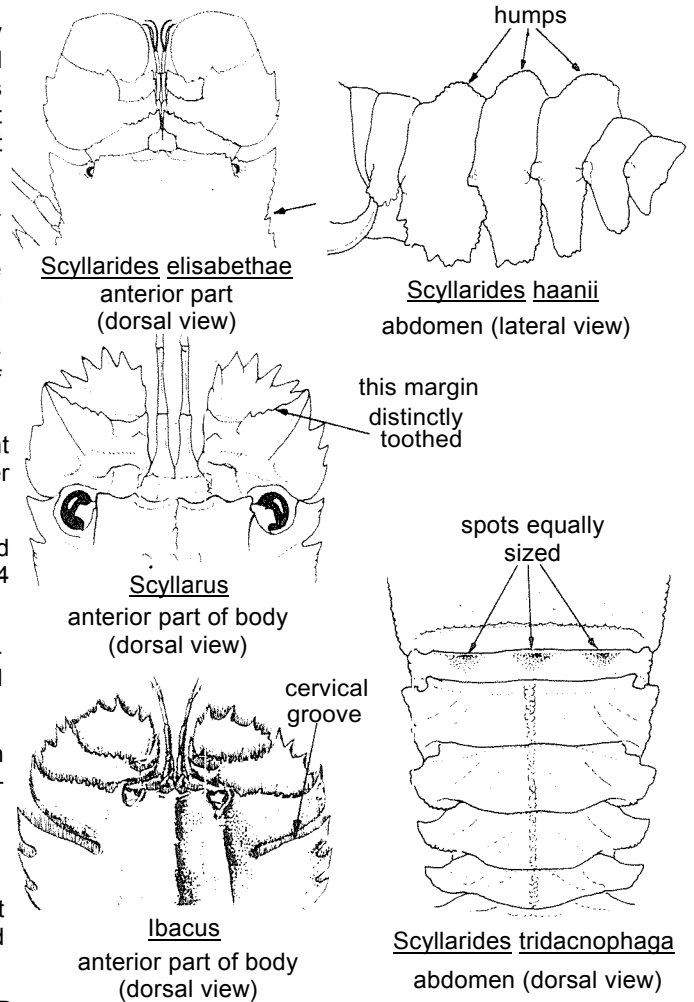
**PRESENT FISHING GROUNDS:**

There is no special fishery for the species, but when taken, it is esteemed as food.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

The species is only occasionally taken. According to Tinker (1965, Pacific Crustacea, 44), in Hawaii the species is caught in wire traps and by divers and is sometimes offered for sale in local markets.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SCYLLARIDAE

FISHING AREA 51  
(W. Indian Ocean)*Scyllarus batei* Holthuis, 1946OTHER SCIENTIFIC NAMES STILL IN USE: *Scyllarus orientalis* (Bate, 1888) not Lund, 1793

## VERNACULAR NAMES:

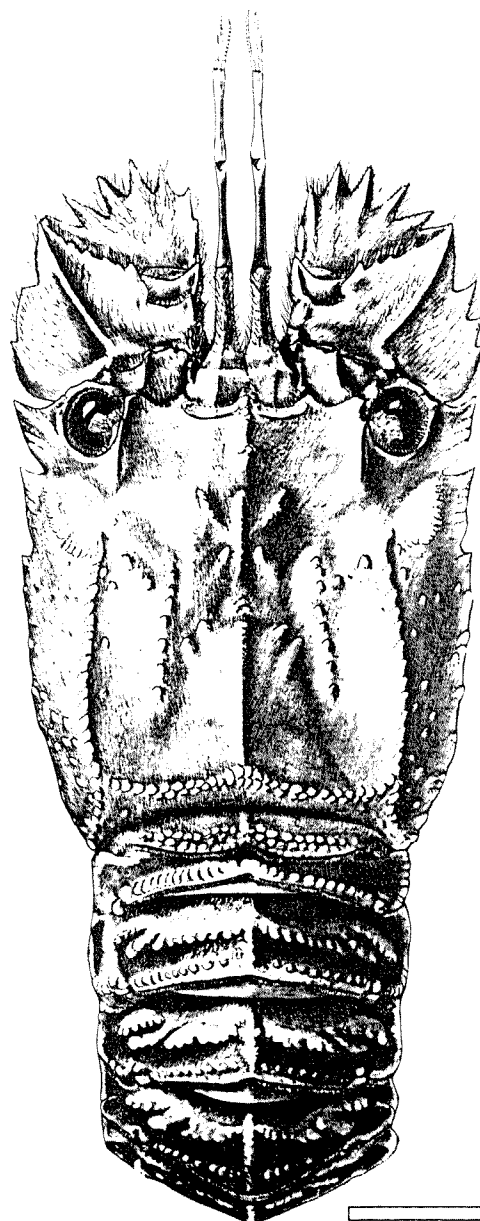
FAO: En - Soft locust lobster  
Fr - Cigale douce  
Sp - Cigarro blanducho

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace rectangular, about as long as broad, lateral margin with 2 shallow incisions, the anterior deepest. Dorsal surface with 3 rather sharp longitudinal keels: the median keel with 3 teeth, one behind and two before the cervical groove; the 2 lateral keels start at inner margin of orbit, are widely interrupted behind the orbit and continue almost to the posterior margin of carapace. Surface of carapace with distinct pubescence, tubercles numerous on the ridges, scarce in between. Antennae large, paddle-shaped, each with two large and some small segments; the anterior large; segment with 6 or 7 sharp triangular teeth; posterior large segment dorsally with a single sharp oblique carina, lateral margin with 2 or 3 teeth. Abdomen with a rather sharp high median carina, and on each segment 1 or 2 transverse carinae with high or squamiform tubercles; hardly any arborescent ornamentation on the segments.

Colour: pale brown with the ridges and tubercles pale purple; a rather conspicuous red spot in each posterolateral angle of the carapace.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Scyllarides rubens, S. rugosus, S. martensii, S. lewinsohni and S. gibberosus: the posterior of the two large plates of the antenna shows in addition to the large oblique carina a shorter carina or a row of large tubercles, in S. batei the surface of the segment is quite smooth on either side of the oblique carina.

S. ornatus: can be immediately distinguished by the presence of a strong sharp median spine on the ventral surface between the bases of the last legs.

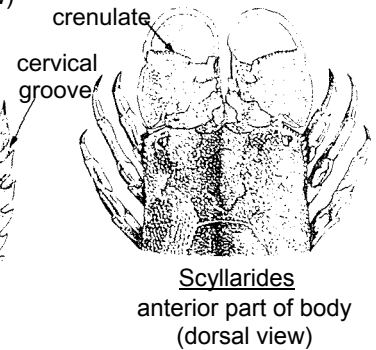
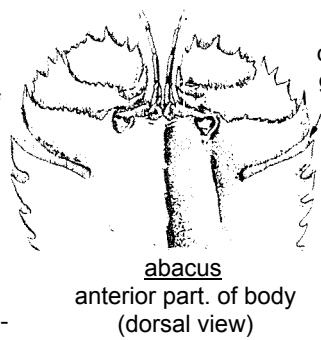
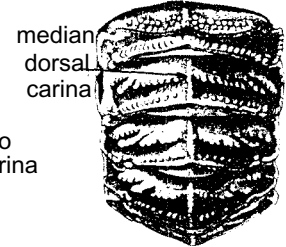
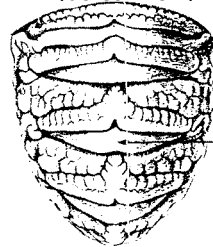
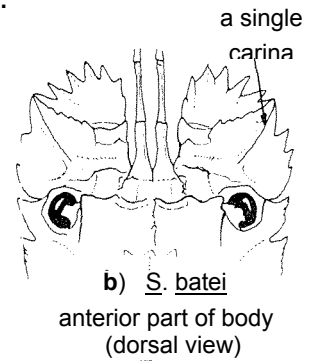
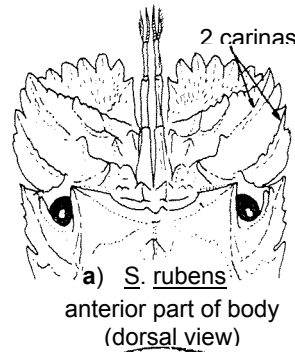
S. cultrifer, S. gibberosus, S. sordidus and S. pumilus: abdomen without a sharp median dorsal carina.

Arctides regalis: distal segment of the antenna with numerous (more than 20) small teeth on anterior margin.

Ibacus and Parribacus species: a deep cervical incision (measuring at least 1/4 of the width of the carapace).

Scyllarides species: much larger and have the distal margin of the anterior large segment of the antenna finely crenulated.

Thenus orientalis: straight lateral margins of the carapace distinctly converging posteriorly; eyes implanted on the anterolateral angles of the carapace.



**SIZE:**

Maximum: about 7 cm total length, corresponding with a carapace length of about 3 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, known from the Gulf of Aden, south coast of the Arabian Peninsula, East African waters (off Kenya and Zanzibar) and southwest coast of India. Also present in the Eastern Indian Ocean and the Western Central Pacific to the Philippines and Indonesia.

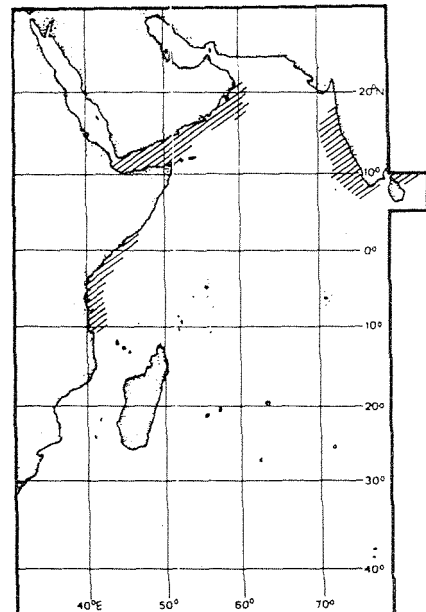
Found on sandy or muddy bottoms at depths between 160 and 270 m.

**PRESENT FISHING GROUNDS:**

There is no special fishery for the species, which is taken occasionally by deep-sea trawlers.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

The species is sometimes taken in small quantities by deep-sea shrimp trawlers (George, 1969, Journ.mar.biol.Assoc. India, 9:433), but certainly cannot be classed as commercially (or potentially commercially) important.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SCYLLARIDAE

FISHING AREA 51  
(W. Indian Ocean)*Thenus orientalis* (Lund, 1793)

OTHER SCIENTIFIC NAMES STILL IN USE: None

## VERNACULAR NAMES:

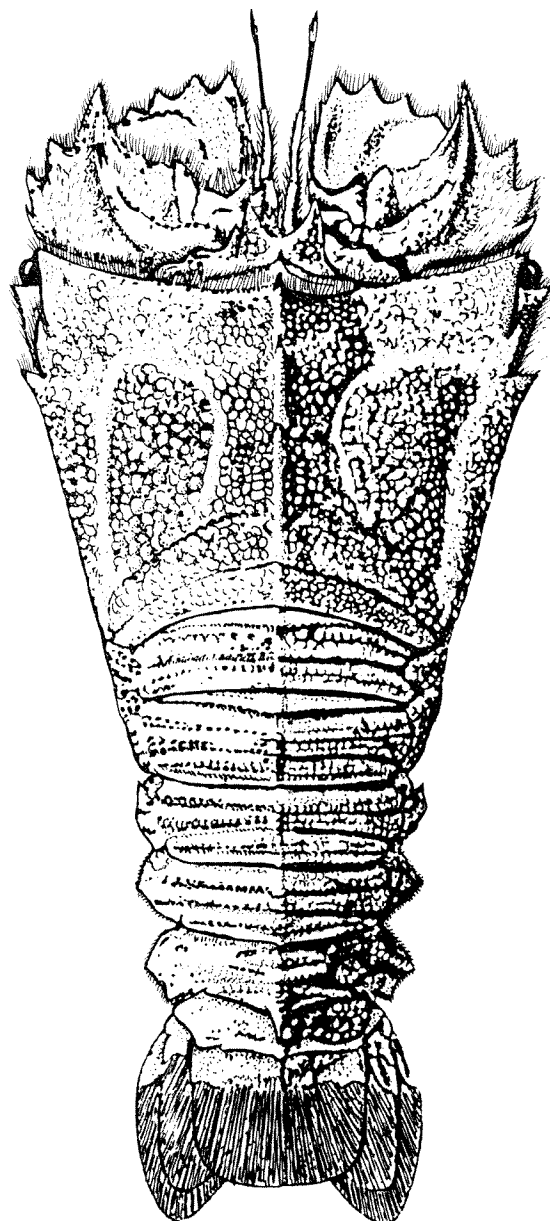
FAO : En - Flathead locust lobster  
Fr - Cigale raquette  
Sp - Cigarro chato

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace flat, widest in front, distinctly narrowing posteriorly; lateral margins straight, with only 2 teeth, one at the end, the other in the anterior fourth, posterior 3/4 without teeth. Anterior tooth forming part of the orbit, which is situated at the antero-lateral angle of carapace. Upper surface of carapace with numerous small granules and a median carina with 3 sharp teeth; a sharp tooth behind the orbit. Anterior large segment of antenna with 3 sharp triangular teeth on inner half of distal margin, some small teeth at either side of these. Posterior large segment ending in a large, sharply pointed, inward curved tooth; outer margin with 3 smaller teeth. Abdomen granular with transverse groove over middle of each segment; fifth segment with a sharp spini-form tooth in the middle of posterior margin.

Colour: pale yellowish brown with the granules of a darker brown. Tips of the teeth whitish. Tail fan with a yellow tinge.





## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

None of the other Scyllarids has the orbits placed at the anterolateral angles of the carapace. Ibacus and Parribacus have the lateral margin of the carapace curved and provided with distinct teeth over the whole length, while furthermore the cervical incision is very deep. Arctides, Scyllarides and Scyllarus have the carapace quadrangular, not strongly narrowing posteriorly, the carapace is not so strongly flattened, and the abdomen lacks the strong posterior median spine of the fifth segment.

## SIZE:

Maximum: about 8 cm carapace length and 25 cm total length.

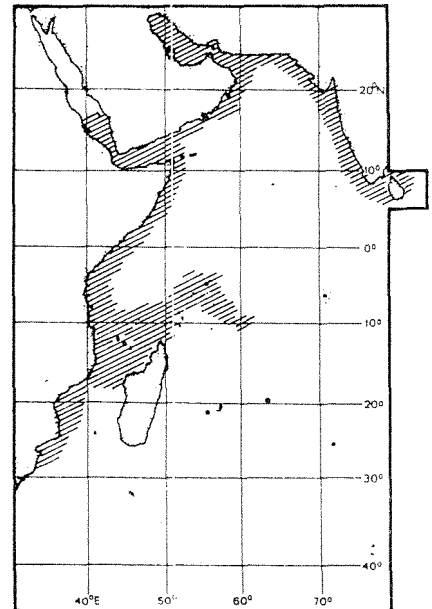
## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

The range of the species extends eastward from the East African coast (southern Red Sea to Natal) to China, Taiwan Island, the Ryukyu Islands, the Philippines, Indonesia and tropical Australia (Western Australia to Queensland).

Found on soft bottoms (mud and/or sand, sometimes mixed with shells or gravel) in depths between 8 and 70 m (exceptionally 100 m), usually between 10 and 50 m.

## PRESENT FISHING GROUNDS:

These lobsters are taken practically throughout their range, although there seems to be no special fishery for them; they form an admixture to shrimp catches.



## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Within, Fishing Area 51 catch statistics of this species are only known from Bahrein where the annual number of metric tons landed amounted to 2 (in 1979), 4 (in 1980) and 7 (in 1981). The catches are classed as "slipper lobsters, Scyllaridae", but evidently consist almost, if not entirely, of this species Ivanov & Krylov (1980, Crustaceana, 38:287) mention rather meager catches off Kenya, Tanzania, Central Mozambique and Mascarene Ridge (up to 30 specimens per hour trawling)

The species is taken with otter-trawls by shrimp trawlers; there are reports that they also are taken by divers.

It is marketed fresh, or frozen (lobsters caught in the southern Red Sea by Israeli trawlers in the 1960s were sold in Israel). In Australia the species is highly esteemed as food, being far superior in taste to Ibacus.

FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

SYNAXIDAE

Furry lobsters

A single species in the area; see species sheet for:

Palinurellus wianeckii (De Man, 1881)      SYNAX Pali 2

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SYNAXIDAE

FISHING AREA 51  
(W. Indian Ocean)Palinurellus wieneckii (De Man, 1881)OTHER SCIENTIFIC NAMES STILL IN USE: Palinurellus gundlachi wieneckii (De Man, 1881)

## VERNACULAR NAMES:

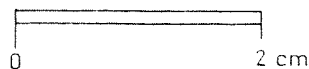
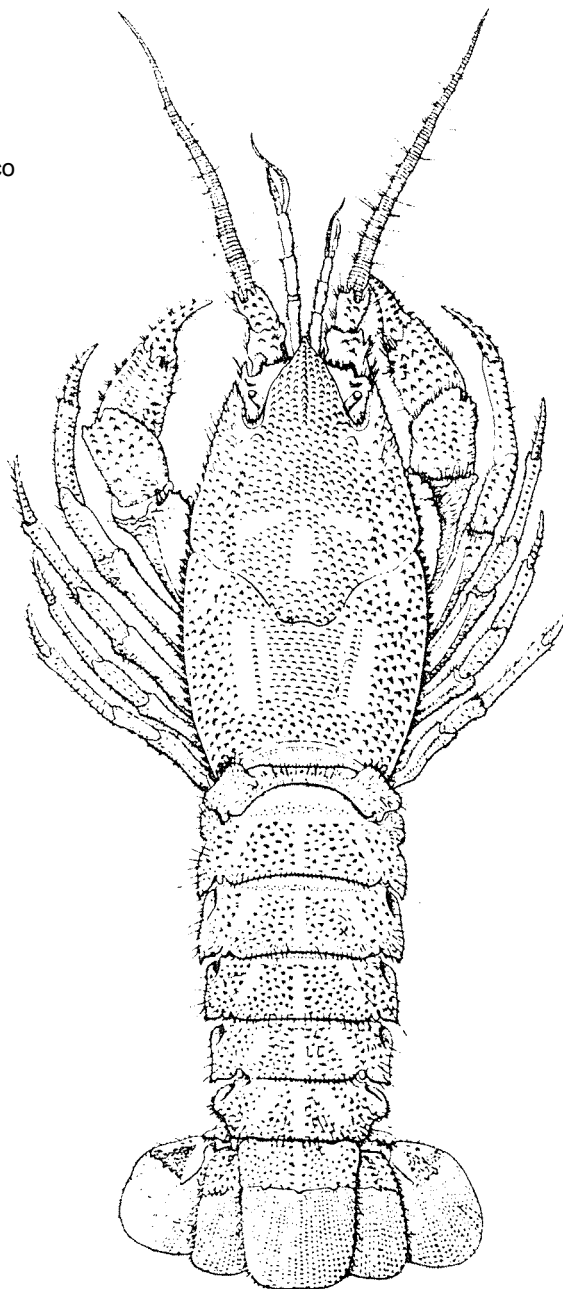
FAO :           En - Indo-Pacific furry lobster  
                   Fr - Cacahouète Indopacifique  
                   Sp - Langosteta del Indo-Pacífico

NATIONAL

## DISTINCTIVE CHARACTERS:

A small lobster. Carapace long and rounded, entirely covered with small, rounded nodules and short hair, but without enlarged spines; a small triangular rostrum present between eyes; frontal horns absent. Antennae shorter than carapace, antennular flagella shorter than antennular peduncles. Abdominal segments hairy like the carapace, with a low smooth keel along dorsal midline, but without transverse grooves. Legs without true pincers, the first pair not longer than, but at least twice as thick as the second.

Colour: uniformly bright orange or orange-red.



**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

The small size, hairy body and the uniformly bright orange or orange-red colour distinguish this species at first sight from any other lobster in the area. The spiny lobsters (Family Palinuridae) are superficially similar in shape and they also lack pincers, but can be easily distinguished by their larger size, the presence of spines on the carapace, (including a pair of strong frontal horns), the long antennae and the absence of a median flattened triangular rostrum.

**SIZE:**

Maximum: total body length about 20 cm, maximum carapace length about 8 cm; common total body length 10 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

There are scattered finds throughout the Indo-West Pacific region. Within Fishing Area 51, the species has been reported from South Africa (Natal) and Mauritius. Outside the area, from west Sumatra, north Borneo, Japan (Amami Islands), the Caroline Islands, and the Tuamotu Archipelago. Larvae probably referable to this species have been reported from the Philippines, New Caledonia, Hawaii and Polynesia.

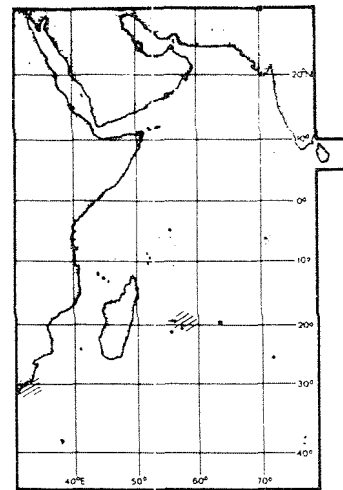
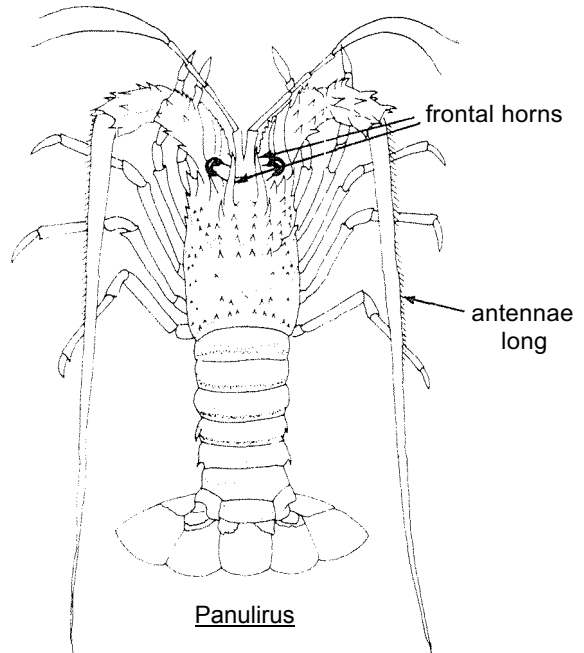
This rather rare species seems to inhabit coral reefs and probably lives in depths of a few metres.

**PRESENT FISHING GROUNDS:**

There is no special fishery for the species. Occasional specimens may be taken by divers.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Too rare and too small to be of significant importance as food. It can be kept in tropical marine aquaria and has caught the interest of the aquarium trade.



# SHRIMPS/ PRAWNS

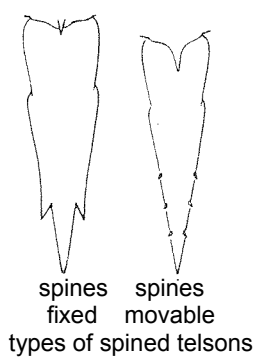
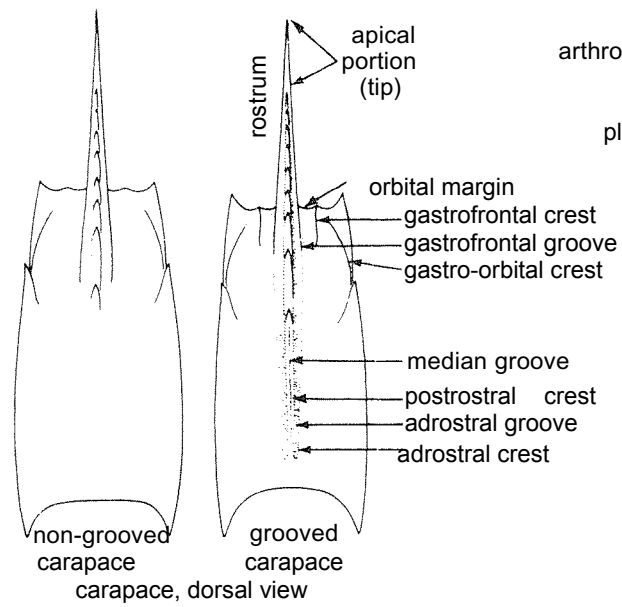
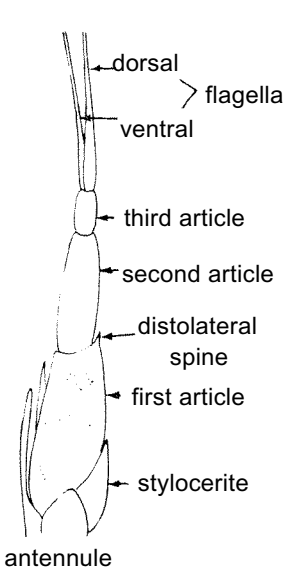
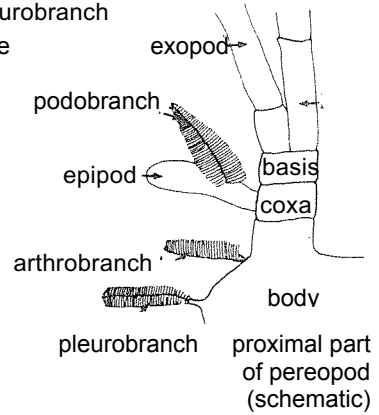
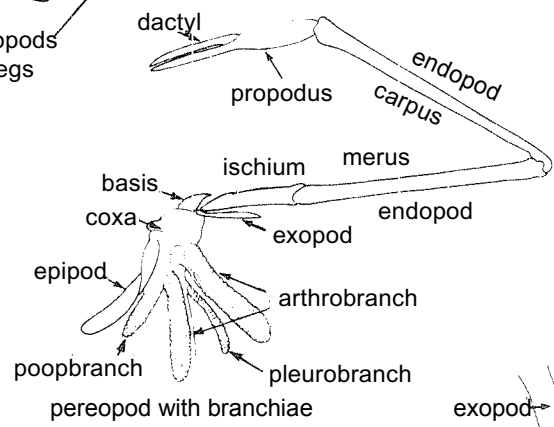
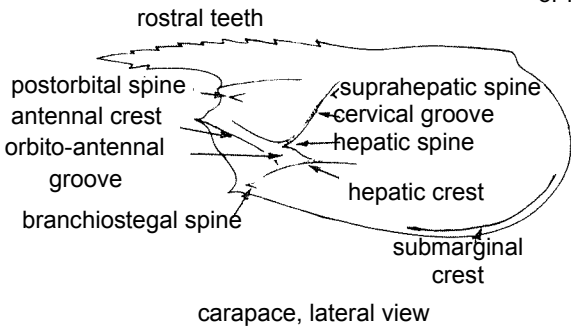
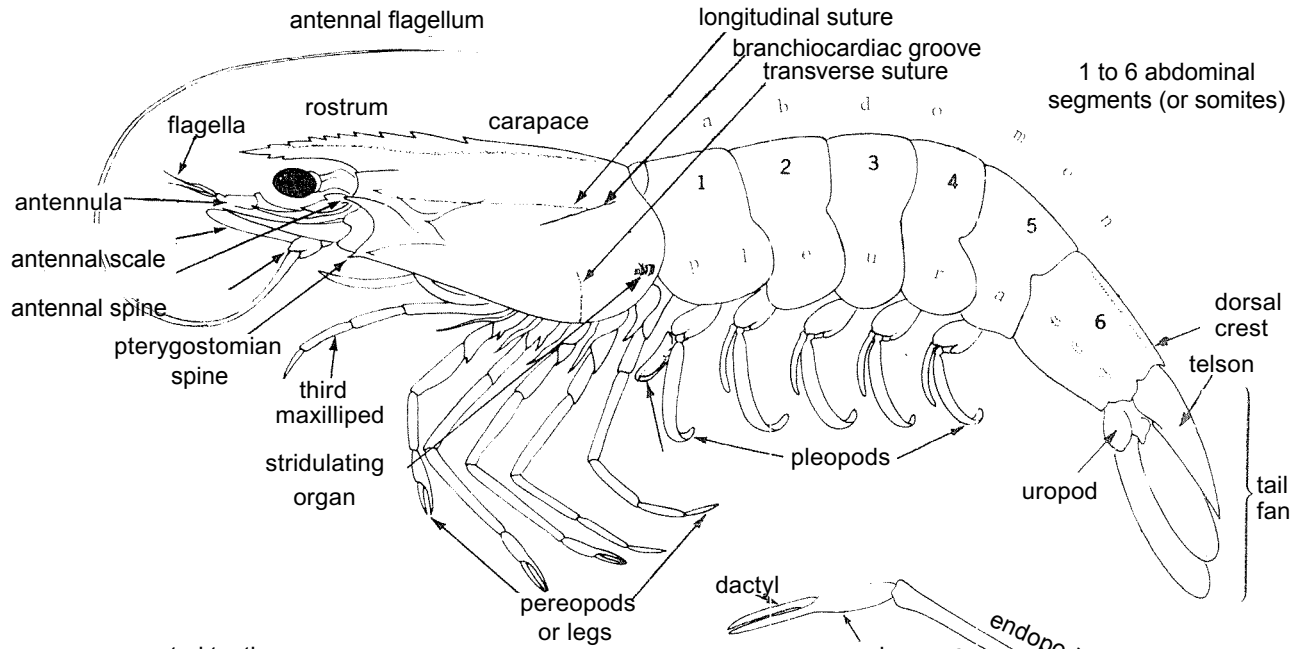
[click for previous page](#)

### IMPORTANT NOTE FOR USERS

These identification sheets may appear rather technical for users not familiar with shrimp taxonomy. It should be borne in mind, however, that many of the shrimp species occurring in Fishing Area 51 cannot be reliably identified by general appearance or easily apparent morphological characters and misidentifications will undoubtedly result from such practice. The user is herewith encouraged to learn the basic terminology and anatomical features used in the family and species accounts presented in this volume, by studying carefully the sections on technical terms and general remarks, and locate the various crests, spines, grooves, appendages, etc. on shrimp specimens. Examination of shrimp specimens for identification purposes often requires magnification (a hand lens of 10 X is usually sufficient), in particular for inspection of the thelycum in females and the petasma in males. Please do not get discouraged by the amount of technical terms and seemingly complicated descriptions. They can be mastered in a relatively short time and they are applied similarly to all species within a family. The present identification sheets, when properly used, should in all cases lead to correct identification of the species in question. Should you have nonetheless doubts we recommend you to preserve the specimen in alcohol, wrap it in a damp cloth, pack and seal it carefully in a plastic bag, and send it for identification to the Division of Crustacea, Rijksmuseum van Natuurlijke Historie, Postbus 9517, 2300 RA Leiden, the Netherlands.

TECHNICAL TERMS AND PRINCIPAL MEASUREMENTS USED

TECHNICAL TERMS



GENERAL REMARKS

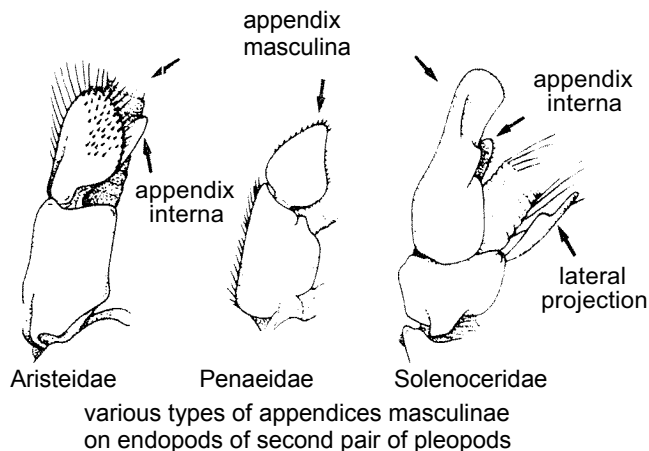
The shrimps constitute a large group of crustaceans varying in size from microscopic to about 35 cm long. Although nearly 2 500 species are known, only slightly less than 300 are of economic interest, and of these about 100 comprise most of the annual world shrimp catches (about 1 600 000 tons, 1978-79-80). The body of the shrimps is almost always laterally compressed, the rostrum usually compressed and toothed, and the abdomen long, longer than the carapace or head. The antennules, or first pair of feelers, in most species bear a small scale or spine, the stylocerite, at their bases, and the antennal scales of the second pair of feelers, the antennae, are generally large and plate-like. The pereopods or legs are usually slender, but in some a single leg or pair of legs may be stout and some pereopods (the chelipeds) end in pincers or chelae. The pleopods or abdominal appendages used for swimming, are well developed and, except in a few species, are present on all five anterior abdominal segments.

Shrimps are widely distributed, occurring in marine, brackish, and freshwaters from the equator to the polar regions. Although the majority of the marine species occupy shallow or moderately deep water, some are found at depths of nearly 5 700 m; however, most of the commercial shrimps are taken on the continental shelves at depths of less than 100 m. In the Western Indian Ocean, only 2 deep-water shrimp, Haliporoides triarthrus and Heterocarpus woodmasoni, are exploited commercially at present but several other deep-water species are of potential interest.

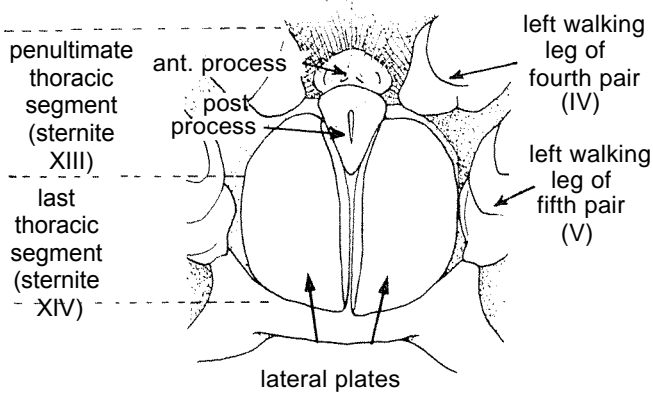
Many shrimps are pelagic but the majority by far are benthic, living on a large variety of bottoms such as rock, mud, peat, sand, fragments of shells or mixtures of these materials. In addition, some frequent coral reefs, and a few species live in sponges and other invertebrates.

In most shrimps, the sexes are separate but certain species such as some Pandalus, commonly first undergo a male phase and later are transformed into females. The paired reproductive organs are situated on each side and just below the heart: in the females the ovaries (which may extend posteriorly along the entire length of the abdomen) are connected by oviducts to openings on the basal article of the third pair of pereopods. In the male, the sperm ducts lead from the testes to terminal ampoules which open on, or adjacent to, the basal article (coxa) of the last pair of pereopods.

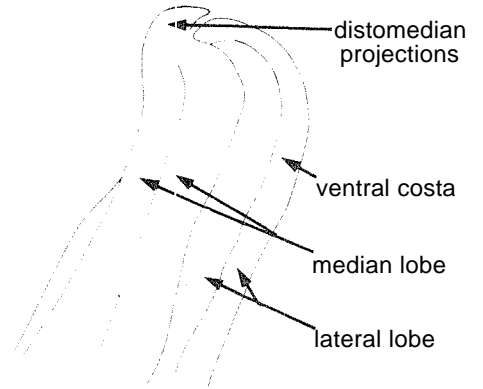
In some penaeidean shrimps the females possess sperm receptacles on the ventral side of the last thoracic segments (between the last pairs of pereopods), where the males deposit the sacs carrying the sperm, whereas in others the females exhibit protuberances and grooves for the attachment of such sacs. Either genital modification is called the thelycum, and there the sperm remain until the eggs are released. In the males there is a petasma formed by the longitudinally folded endopods of the first pair of pleopods. Most male shrimps bear an appendix masculina, a lappet borne on the endopod of the second pair of pleopods, the presence or absence of which constitutes a ready means for distinguishing males from females. In many shrimps an appendix interna (slender rod or blade) occurs adjacent to the appendix masculina; among carideans such a structure is also present on the third through the fifth pleopods of both sexes.



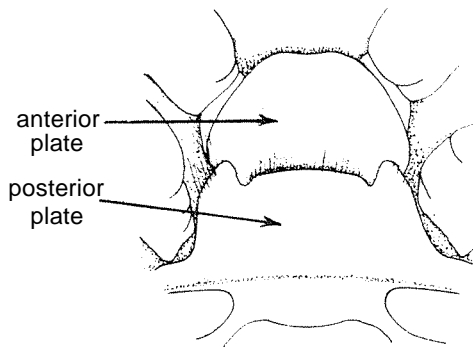




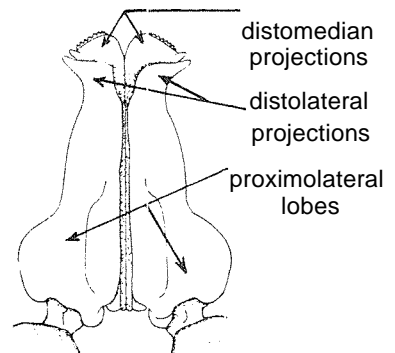
Penaeus



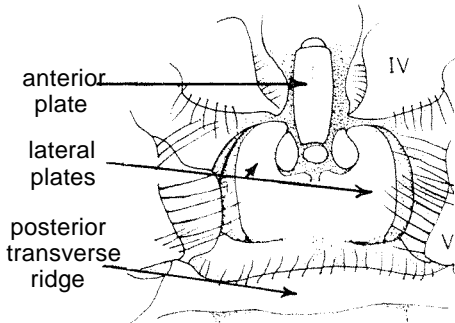
lateral view  
Penaeus



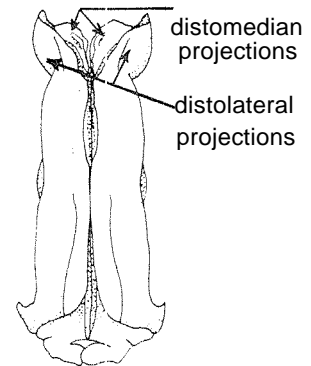
Parapenaeopsis



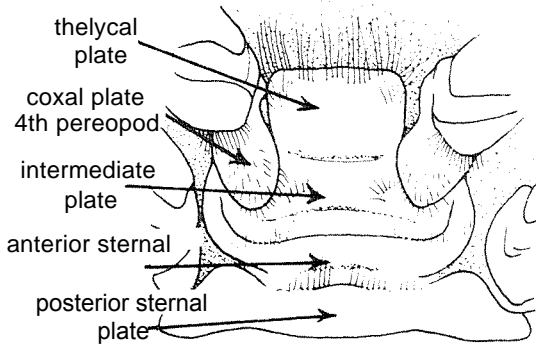
Parapenaeopsis



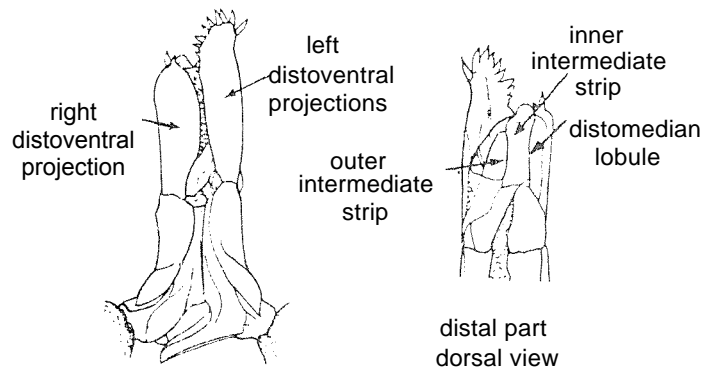
Metapenaeus



Metapenaeus

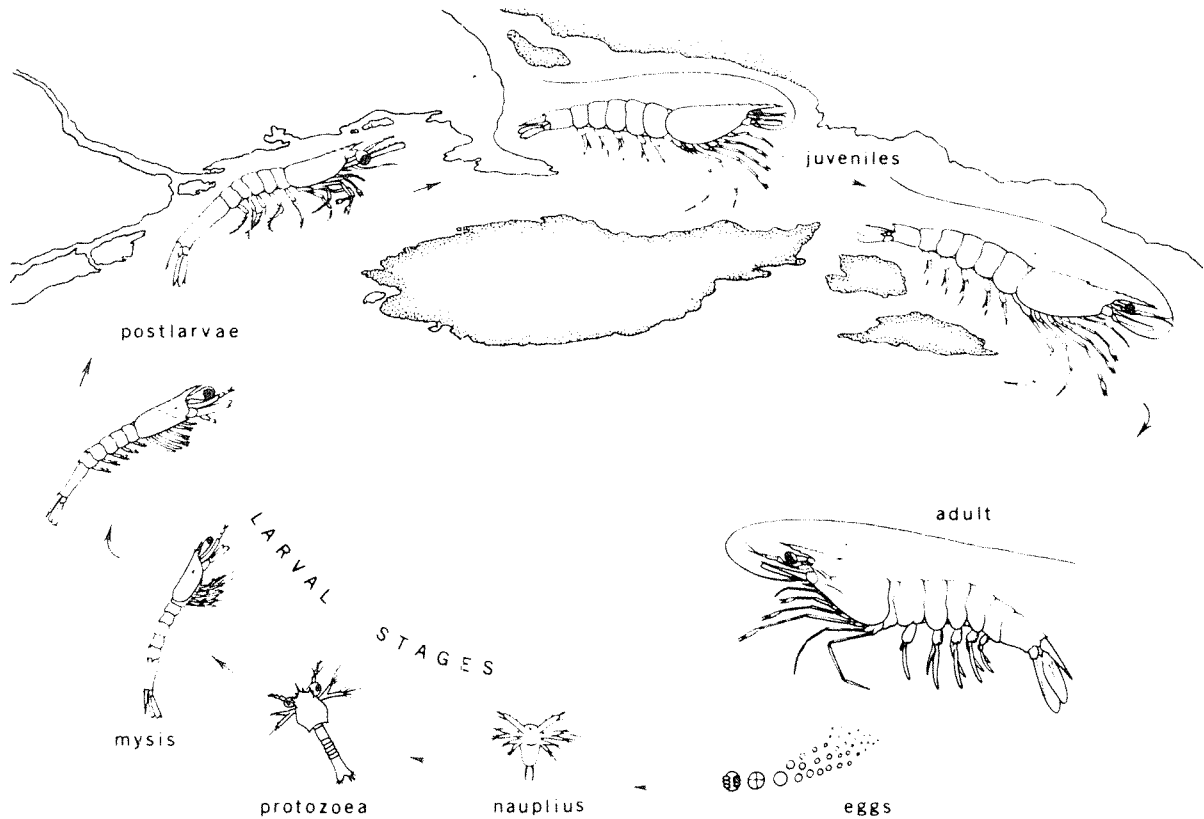


Metapenaeopsis  
principal types of thelycum  
of female penaeid shrimps,  
ventral view



Metapenaeopsis  
principal types of petasma  
(joined endopods of first pair  
of pleopods) of male penaeid shrimps,  
ventral view - except: otherwise stated

In the stenopodidean and caridean shrimps the female carries the eggs after extrusion, masses of them being fastened to the pleopod where they remain until they hatch at a relatively advanced larval stage or as juveniles. In contrast, in the penaeideans the eggs are not retained by the female, but released directly into the water, and the larvae undergo an extensive metamorphosis, the first part of a complex life cycle, which may require both oceanic and brackish waters. For example, the members of the genus Penaeus, the most valuable commercial shrimps, spawn offshore at depths of about 10 to 80 m.



Life-cycle: of shrimps of the genus Penaeus

Eggs hatch within a few hours, releasing very small, simple larvae, the nauplii, the first of usually 11 larval stages, which include 5 nauplii, 3 protozoaeae and 3 mysis. The larvae are planktonic and are carried by currents toward shore where they arrive as postlarvae; this occurs about 3 weeks after hatching when the animals are about 6 to 14 mm long, and shrimp-like in appearance. The postlarvae invade inshore, brackish waters, abandon their planktonic way of life, and become bottom dwellers living in shallow littoral areas. In these rich nursery grounds they grow rapidly, develop into juveniles and, as size increases, move gradually back toward the mouths of bays or estuaries, where they become subadults. Soon the shrimp migrate offshore, continue growing, and finally, as adults, reach the spawning grounds, where the mature females spawn and the cycle is repeated; most shrimps in these grounds are less than a year old. Penaeidean shrimps are very prolific, for example, a single female of Penaeus may produce as many as 500 000 eggs. Carideans, in contrast, produce a much smaller number -correlated with the fact that the females carry their eggs until hatching.

Most of the commercial shrimp species belong to the 5 penaeidean families Solenoceridae, Aristeidae, Penaeidae, Sicyoniidae and Sergestidae - and 3 caridean ones - Pandalidae, Crangonidae and Palaemonidae. The penaeideans are exploited mainly in tropical and subtropical waters, the members of Pandalidae and Crangonidae in temperate seas, and those of Palaemonidae in brackish waters from the tropic to the temperate zones. Another 2 caridean families, Hippolytidae and Alpheidae, contain species of some economic interest in the Western Indian Ocean. The shrimp fauna of the latter area is grouped into 27 families, only 9 of which include species fished commercially or of potential interest. The shrimp catch reported from Fishing Area 51 in 1980 totalled nearly 260 000 tons (heads-on).

**LIST OF FAMILIES OCCURRING IN THE AREA:**

Code numbers are given for those families for which Identification Sheets are included

Phylum Arthropoda		Infraorder Caridea	
Class Crustacea		Family Oplophoridae	
Subclass Malacostraca		Family Nematocarciridae	
Series Eumalacostraca		Family Atyidae	
Superorder Eucarida		Family Stylodactylidae	
Order Decapoda		Family Pasiphaeidae	
		Family Disciadidae	
Suborder Dendrobranchiata		Family Eugonatonotidae	
		Family Rhynchocinetidae	
Infraorder Penaeidea		Family Campylonotidae	
		Family Palaemonidae	PALAE
Superfamily Penaeoidea		Family Gnathophyllidae	
Family Solenoceridae	SOLENO	Family Psalidopodidae	
Family Aristeidae	ARIST	Family Alpheidae	ALPH
Family Penaeidae	PEN	Family Ogyrididae	
Family Sicyoniidae	SICYON	Family Hippolytidae	HIPPOL
		Family Processidae	
Superfamily Sergestoidea		Family Pandalidae	PANDL
Family Sergestidae	SERG	Family Thalassocarididae	
Family Luciferidae		Family Glyphocrangonidae	
		Family Crangonidae	
Suborder Pleocyemata			
Infraorder Stenopodidea			
Family Stenopodidae			

Prepared by J.C. Miguel, temporary address: Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.

Technical Terms and General Remarks are based on similar sections of FAO Species Identification Sheets for the W.C. Atlantic, prepared by I. Pérez-Farfante.

## FAO SPECIES IDENTIFICATION SHEETS

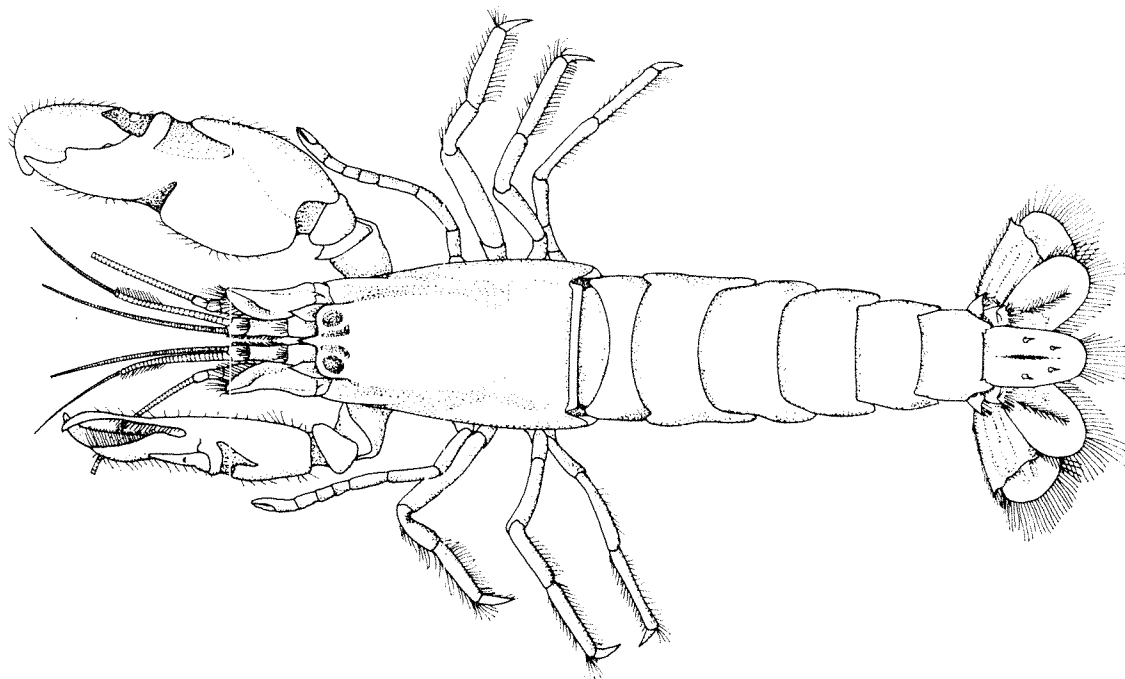
FISHING AREA 51  
(W. Indian Ocean)

## ALPHEIDAE

## Snapping shrimps

Small to medium-sized shrimps. Carapace cylindrical or laterally compressed, usually covering the eyes, so that these are not visible in dorsal view; rostrum very small, without teeth, sometimes entirely absent. Pleura of second abdominal somite wide and covering both those of first and third somites. Telson usually wide. First pereopods very heavy, usually unequal; pincer of larger leg swollen, often with sound-producing teeth and sockets on the fingers. Second legs very slender and rather short, equal and with pincers; carpus subdivided into several segments. Following pereopods with simple or bifid dactyls, without pincers. No exopods on any of the legs. Males without petasma, females without thelycum. Colour very diverse, sometimes very bright and often with a pattern that is characteristic for the species.

This family includes a great number of marine representatives, but only a few species belonging to the genus *Alpheus* are sporadically found in the landings.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

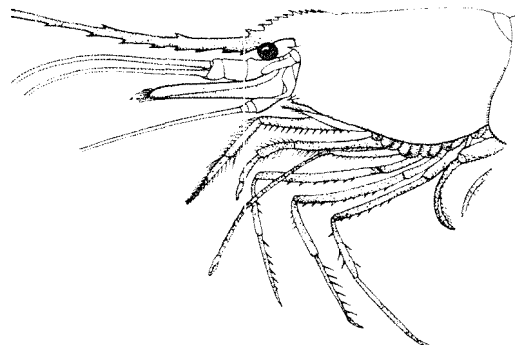
Hippolytidae: eyes free; first pair of pereopods short and rather heavy but not swollen; tips of fingers usually dark coloured.

Ogyridae: eyes extremely elongate, reaching to end of antennular peduncle, cornea small; first pair of pereopods shorter than and about as robust as second.

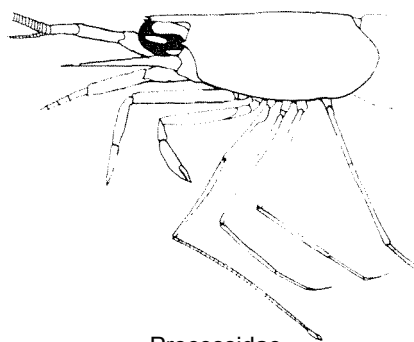
Processidae: eyes free; usually only one leg of first pair of pereopods with pincer, the other ending in a simple claw-like dactyl.

Other families of Caridea: either pincer of first pair of pereopods microscopically small or absent (Superfamily Pandatoidea), or first pair of pereopods subchelate (Superfamily Crangonoidea), or carpus of second pair of pereopods not subdivided.

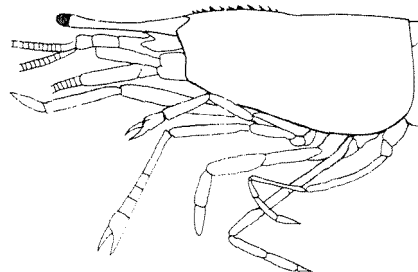
Families of the Infraorder Penaeidea: pleura of second abdominal segment not overlapping those of first; 3 first pairs of pereopods ending in pincers.



Hippolytidae



Processidae



Ogyridae

A key to genera occurring in the area is not presented here since out of about 20 genera only one, Alpheus, is of some interest to fisheries.

Alpheus can be distinguished by the following combination of characters from the other genera of Alpheidae: eyes completely covered by the carapace, which forms orbital hoods that hide them from both dorsal and anterior view; carapace cylindrical; epipods present at bases of pereopods; sixth abdominal segment not showing a posterolateral plate; first pair of pereopods very unequal, movable finger of the larger pincer with a molar-shaped tooth, which fits in a cavity of the immovable finger.

The genus Alpheus is one of the Caridean genera that has the most species; however practically all of these species are small and of no commercial interest. The following 2 species are of reasonably big size (more than 3.5 cm in total length) and have been occasionally found in fish markets or landing places in the area:

Alpheus euprosyne De Man, 1897

Alpheus malabaricus Fabricius, 1798

## FAD SPECIES IDENTIFICATION SHEETS

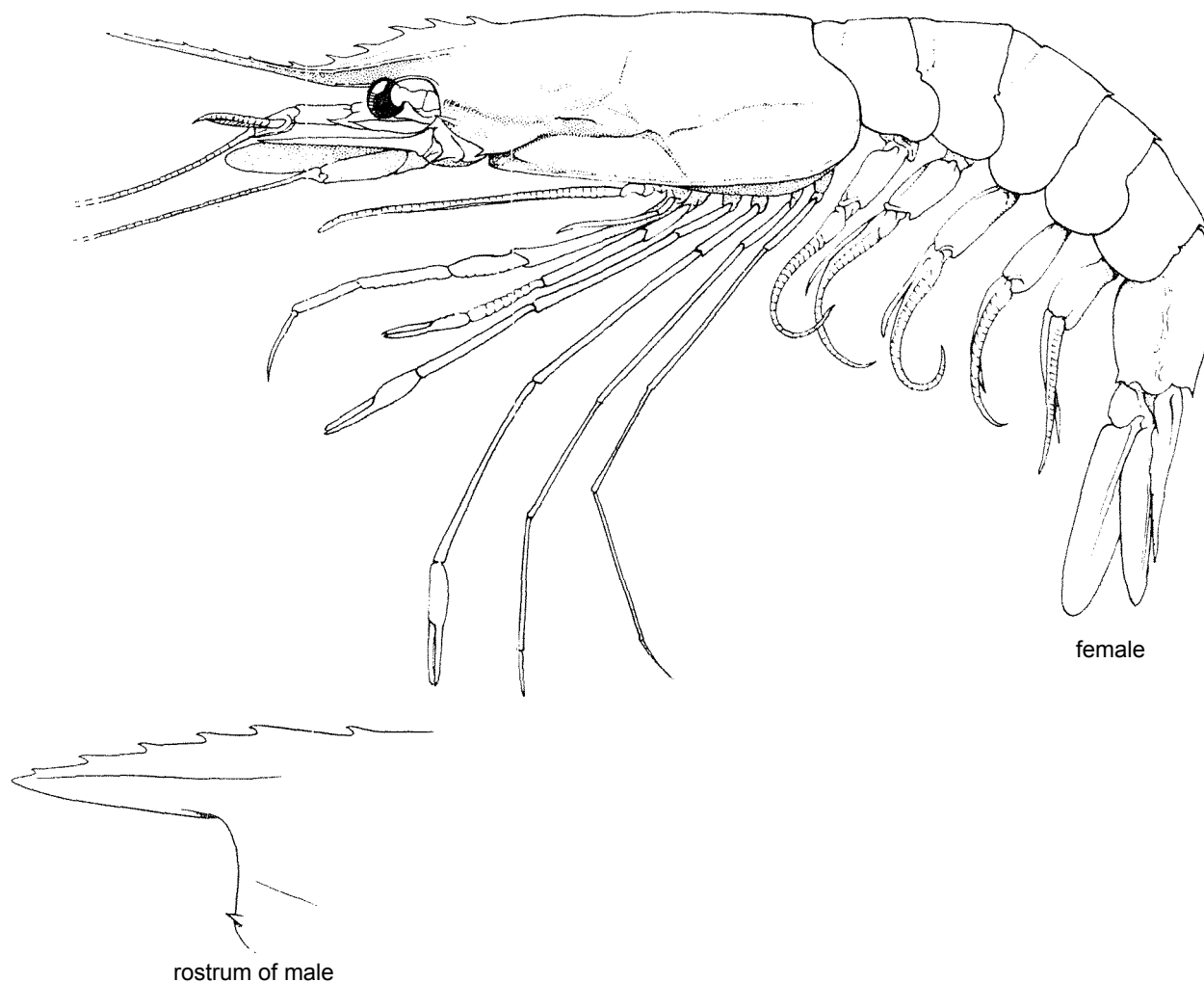
FISHING AREA 51  
(W. Indian Ocean)

## ARISTEIDAE

## Aristeid shrimps

Rostrum usually very long in females and young males but becoming rather short in adult males (subfamily Aristeinae) or, rostrum short, not exceeding the eye (subfamily Benthesicyminae); no styliform projection at base of eyestalk, but a tubercle present on its mesial (inner) border (very small in *Aristaeomorpha*). Carapace without postorbital spine; cervical groove either long, extending almost to dorsal midline of carapace, or very short; last 2 pairs of pereopods well developed; endopods of second pair of pleopods in males bearing appendix masculina and appendix interna, but no lateral projection; third and fourth pairs of pleopods biramous; telson armed with 1 to 4 movable spines on each side. Two well developed arthrobranchs on penultimate thoracic segment (hidden beneath the carapace).

All the representatives of this family are marine and occur in deep waters. At present none of them is regularly fished in the area, but during recent exploratory surveys, several species belonging to the genera *Aristaeomorpha*, *Aristeus* and *Plesiopenaeus* have been found to be abundant enough as to be considered of potential interest to fisheries. The species of the subfamily Benthesicyminae are of no interest to fisheries.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

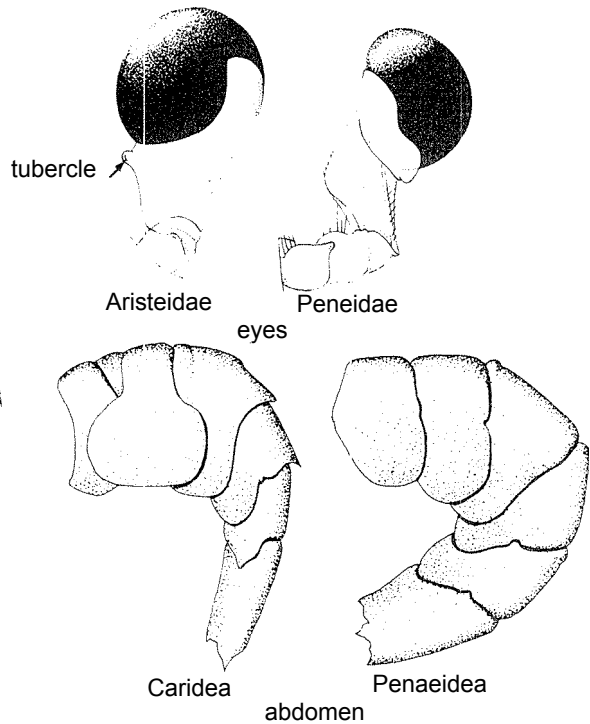
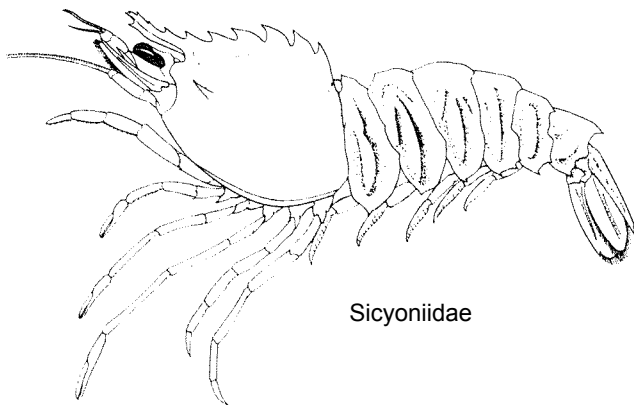
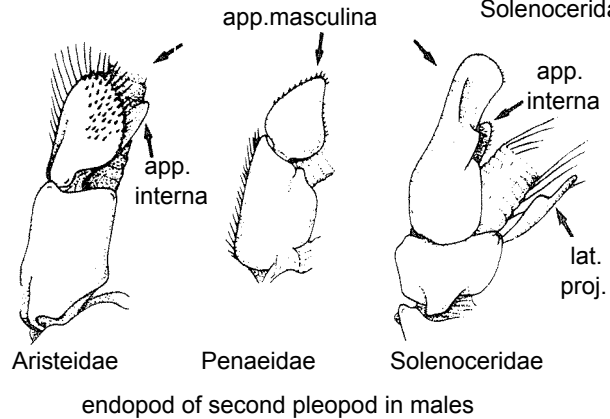
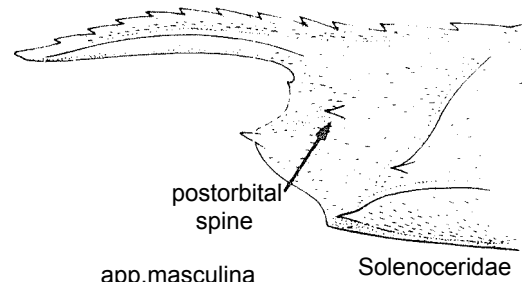
**Solenoceridae:** carapace with postorbital spine; telson with a fixed spine on each side of tip; endopods of second pair of pleopods in males bearing appendix masculina, appendix interns and lateral projection.

**Penaeidae:** eyestalk without a tubercle on mesial (inner) border; endopods of second pair of pleopods in males bearing appendix masculina only; a single, well developed arthrobranch on penultimate thoracic segment.

**Sicyoniidae:** body thick, stony in appearance; abdomen with deep grooves and numerous tubercles; third and fourth pair of pleopods single-branched.

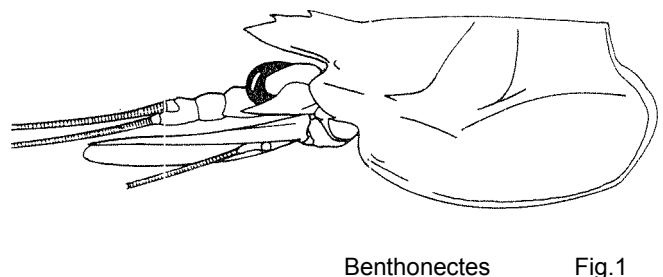
**Sergestidae:** small size shrimps; rostrum very short; last 2 pairs of pereopods shorter than anterior legs (fifth pair much shorter) or absent.

Shrimps belonging to the Infraorder Caridea: pleura of second abdominal segment overlapping those of first and third segments; no pincers on third pair of pereopods.



**KEY TO SUBFAMILIES OCCURRING IN THE AREA:**

- 1a. One or 2 dorsal rostral teeth; upper antennular flagella very long and filiform almost throughout their length (Fig.1); bathypelagic species ..... Benthosicyminae
- 1b. Three or more dorsal rostral teeth; upper antennular flagella very short and flattened almost throughout their length (Fig. 2) ..... Aristeinae

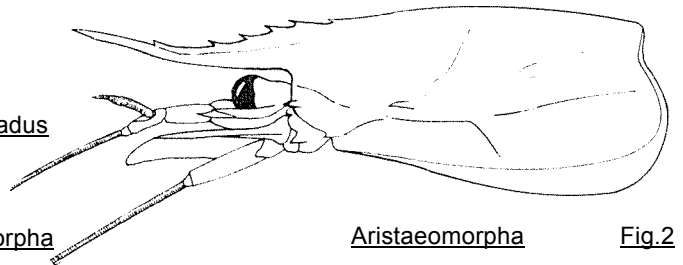


**KEY TO GENERA OF ARISTEINAE OCCURRING IN THE AREA:**

1a. Hepatic spine present (Fig.3)

2a. Rostrum armed with 3 dorsal teeth (Fig. 3) ..... Hepomadus

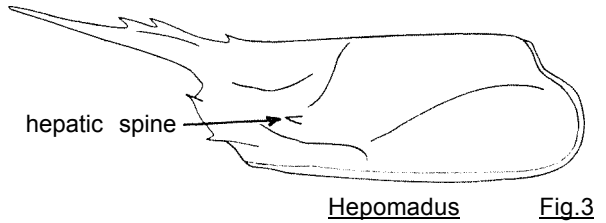
2b. Rostrum armed with 4 or more dorsal teeth (Fig. 2) ..... Aristaeomorpha



1b. Hepatic spine absent

3a. Carapace with a postantennal spine (Fig. 4) ..... Parahepomadus

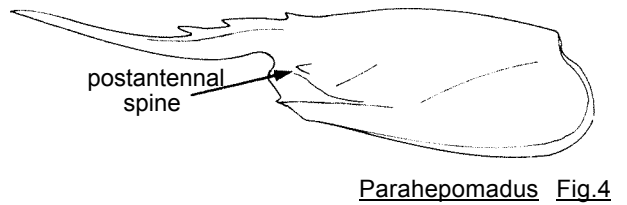
3b. No postantennal spine on carapace



4a. Podobranch present on antepenultimate thoracic segment (segment X11)

5a. Epipod on fourth pereopod: (segment XIII) rudimentary, reduced to a small quadrangular lamella ..... Hemipenaeus

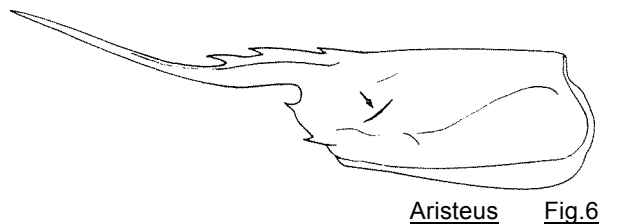
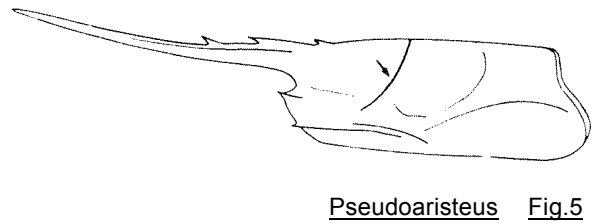
5b. A large epipod on fourth pereopods ..... Plesiopenaeus



4b. No podobranch on segment XII

6a. Cervical groove long, extending to dorsal midline of carapace (Fig. 5) ..... Pseudoaristeus

6b. Cervical groove distinct only in its basal part (Fig. 6) ..... Aristeus





**LIST OF SPECIES OF ARISTEINAE OCCURRING IN THE AREA:**

- \* Aristaeomorpha foliacea (Risso, 1827)
- Aristaeomorpha woodmasoni Calman, 1925
  
- Aristeus alcocki Ramadan, 1938
- Aristeus antennatus (Risso, 1816)
- Aristeus mabahissae Ramadan, 1938
- Aristeus semidentatus Bate, 1881
- Aristeus virilis (Bate, 1881)
  
- Hemipenaeus carpenteri Wood Mason, 1891
- Hemipenaeus spinidorsalis Bate, 1881
  
- Hepomadus tener Smith, 1884
  
- Parahepomadus vaubani Crosnier, 1978
  
- Plesiopenaeus armatus (Bate, 1881)
- Plesiopenaeus coruscans (Wood Mason, 1891)
- Plesiopenaeus edwardsianus (Johnson, 1868)
  
- Pseudoaristeus crassipes (Wood Mason, 1891)
- Pseudoaristeus sibogae (De Man, 1911)

Some scientists consider the Indian Ocean specimens a species named Aristaeomorpha rostridentata (Bate, 1881). In this case, A. foliacea is restricted to the Atlantic Ocean.

## FAO SPECIES IDENTIFICATION SHEETS

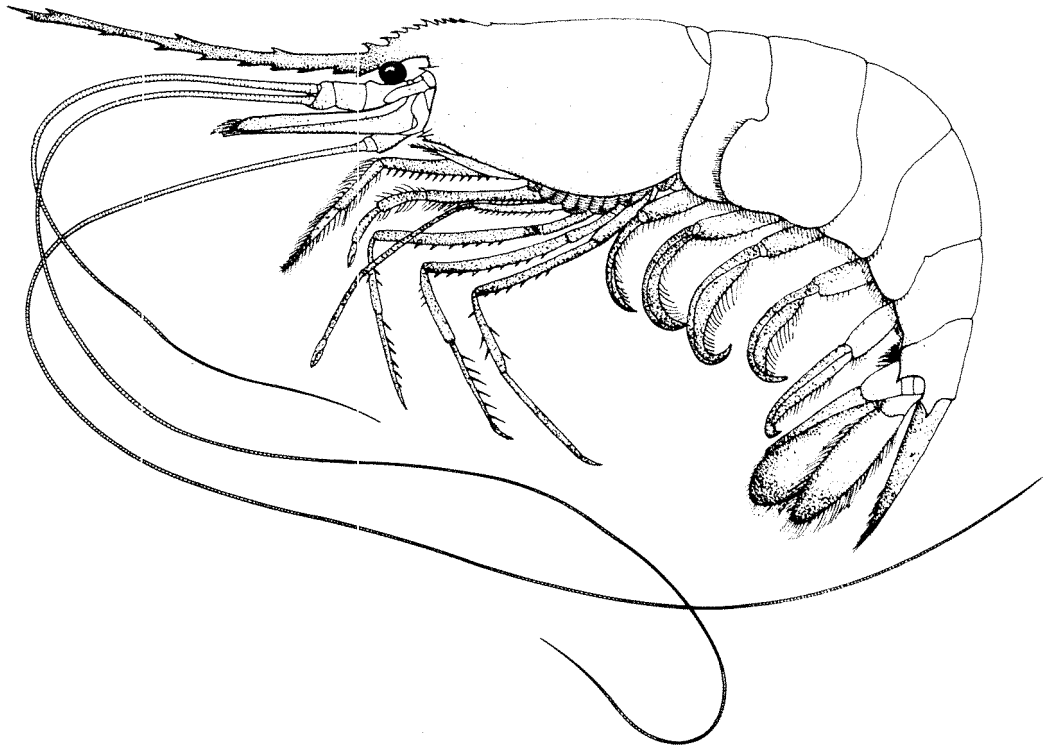
FISHING AREA 51  
(W. Indian Ocean)

## HIPPOLYTIDAE

## Cock shrimps

As in the other families belonging to the Infraorder Caridea, the pleura of the second abdominal segment overlap those of the first and third segments, and the third pair of pereopods lack pincers. Rostrum generally longer than eyes and usually with several dorsal and ventral teeth; eyes free, not covered by carapace; first pair of pereopods ending in clearly distinct pincers and broader than second pair, but not considerably enlarged; carpus of second pair divided into several articles.

This family includes a good number of marine representatives, but only one species is of economic interest in Fishing Area 51.



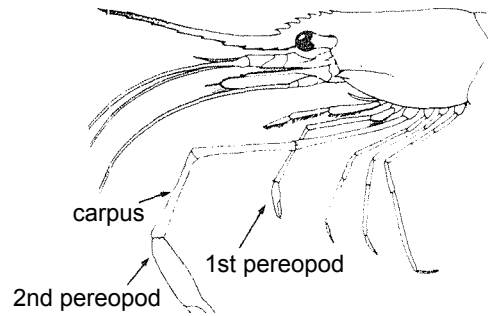
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Palaemonidae: first pair of pereopods more slender than second pair, or at most as broad; carpus of second pair undivided.

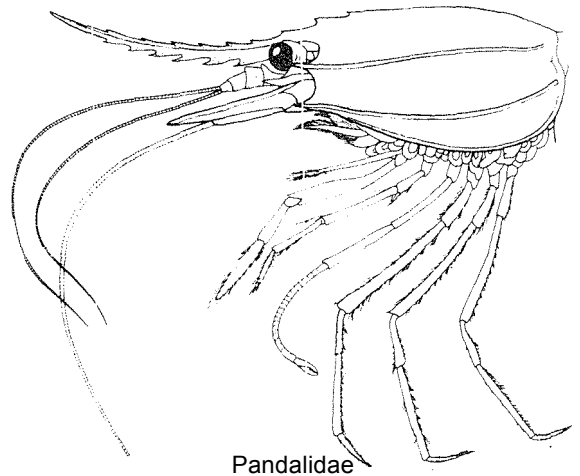
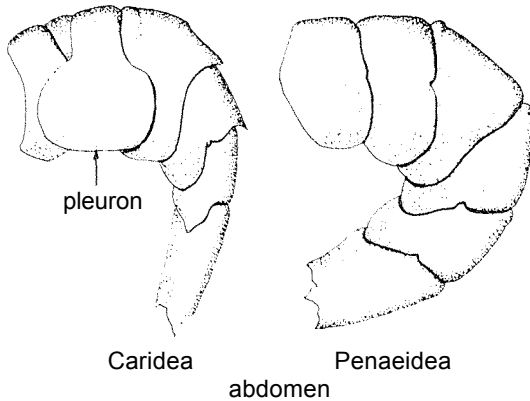
Alpheidae: first pair of pereopods much broader than second, often considerably enlarged; eyes short, usually covered by carapace.

Pandalidae: first pair of pereopods with pincers microscopically small or absent.

Families of the Infraorder Penaeidea: pleura of second abdominal segment not overlapping those of first; 3 first pairs of pereopods ending in pincers.



Palaemonidae



Pandalidae

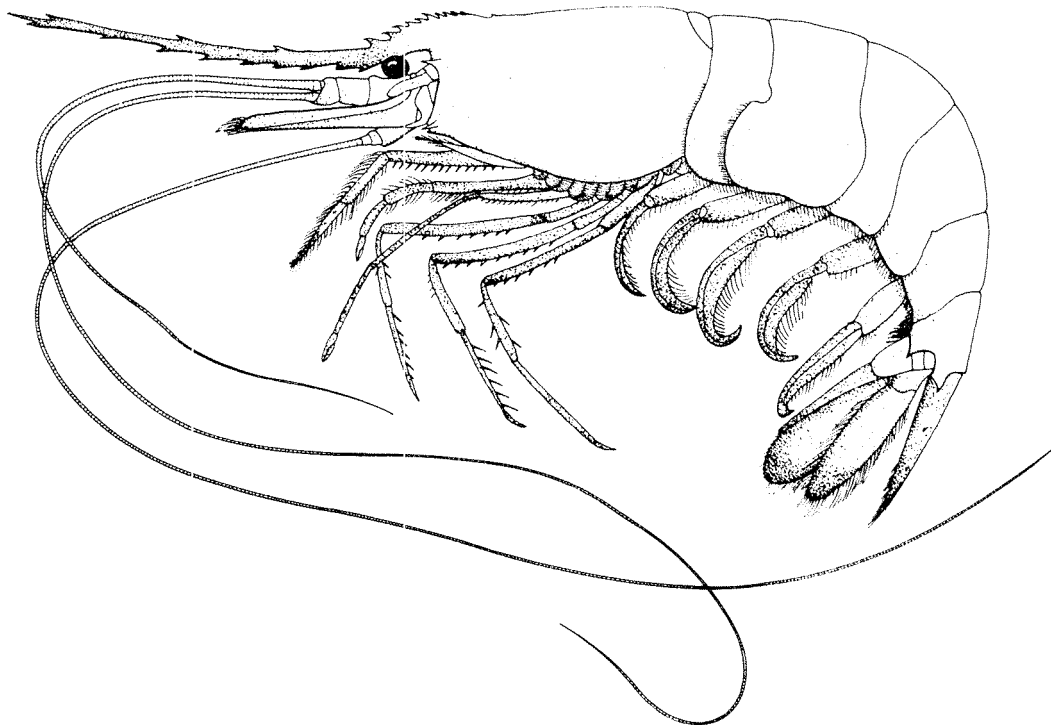
A key to genera and a list of species occurring in the area are not presented here since out of ten genera only one is of economic interest in Fishing Area 51:

Exhippolysmata ensirostris (Kemp, 1914)

HIPPOL Exhip 2

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: HIPPOLYTIDAE

FISHING AREA 51  
(W. Indian Ocean)Exhippolysmata ensirostris (Kemp, 1914)OTHER SCIENTIFIC NAMES STILL IN USE: Hippolysmata ensirostris (Kemp, 1914)

## VERNACULAR NAMES:

FAO: En - Hunter shrimp  
Fr - Bouc chasseur  
Sp - Camarón cazador

NATIONAL:



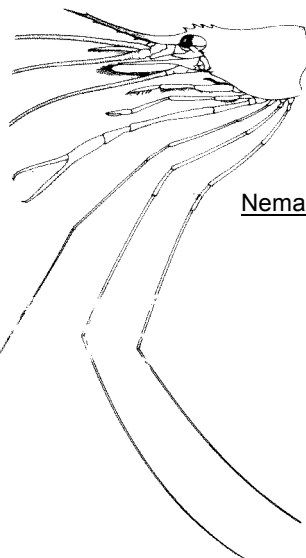
## DISTINCTIVE CHARACTERS:

Carapace smooth or pitted. Rostrum long, longer than carapace, its dorsal margin with an elevated basal crest of 7 to 12 teeth, which are placed close together, rest of dorsal margin with 3 or 4 widely spaced teeth; ventral margin with 7 to 16 more or less equally spaced teeth; antennal and pterygostomian spines present on carapace; abdominal segments dorsally smooth, without spines; pleura of fifth segment sharply pointed; telson with a long, pointed tip, with or without a pair of small distolateral spines. Second pair of pereopods with small pincers, carpus long and subdivided into more than 7 articles; dactyls of last 3 pairs of pereopods simple and much shorter than propodi.

Colour: whitish or pinkish with the appendages (especially the third maxillipeds, pleopods and uropods) red, often dark red; rostrum and flagella also reddish.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRHNG IN THE AREA :

Nematopalaemon tenuipes (Family Palaemonidae): second pair of pereopods with conspicuous pincers which have the fingers longer than the slightly swollen palm, carpus undivided (pincers small and carpus subdivided in at least 7 articles in E. ensirostris); dactyls of last 3 pairs of pereopods thread-like and basal crest of rostrum with only 5 to 7 teeth, distal part of rostrum usually unarmed except for a subdistal tooth.



Nematopalaemon tenuipes

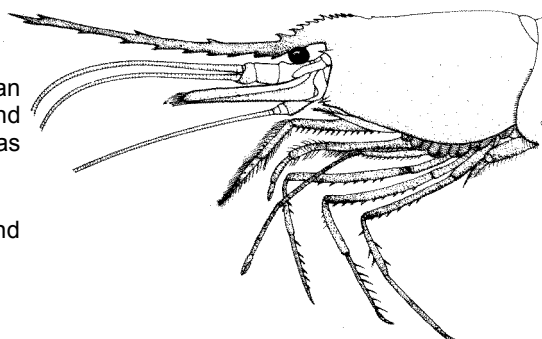
### SIZE:

Maximum total length: 7.9 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, the species occurs along the east African coast from Kenya to South Africa (Natal), and on the west and south coasts of India and Sri Lanka. Further east, it extends as far as Indonesia and New Guinea.

Inhabits shallow marine or estuarine waters; often found together with Nematopalaemon tenuipes.



*Exhippalysmata ensirostris*

### PRESENT FISHING GROUNDS:

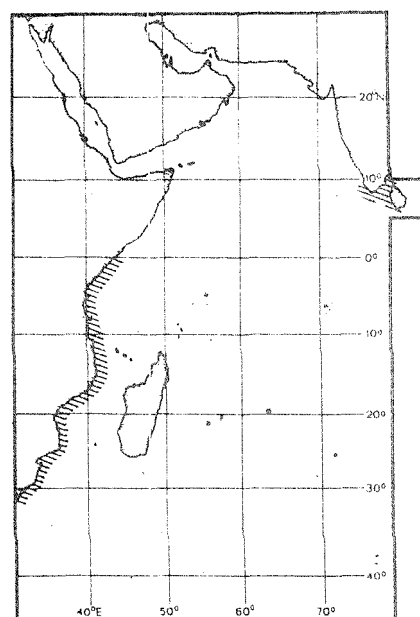
Abundantly fished and of major importance in the inshore catches from the central and north-west coasts of India (Gujarat, Maharashtra).

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :

Separate statistics are not reported for this species by FAO.

Caught with barrier and stake nets, bag nets, shore seines, boat seines and cast nets.

Marketed mainly fresh or dried.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

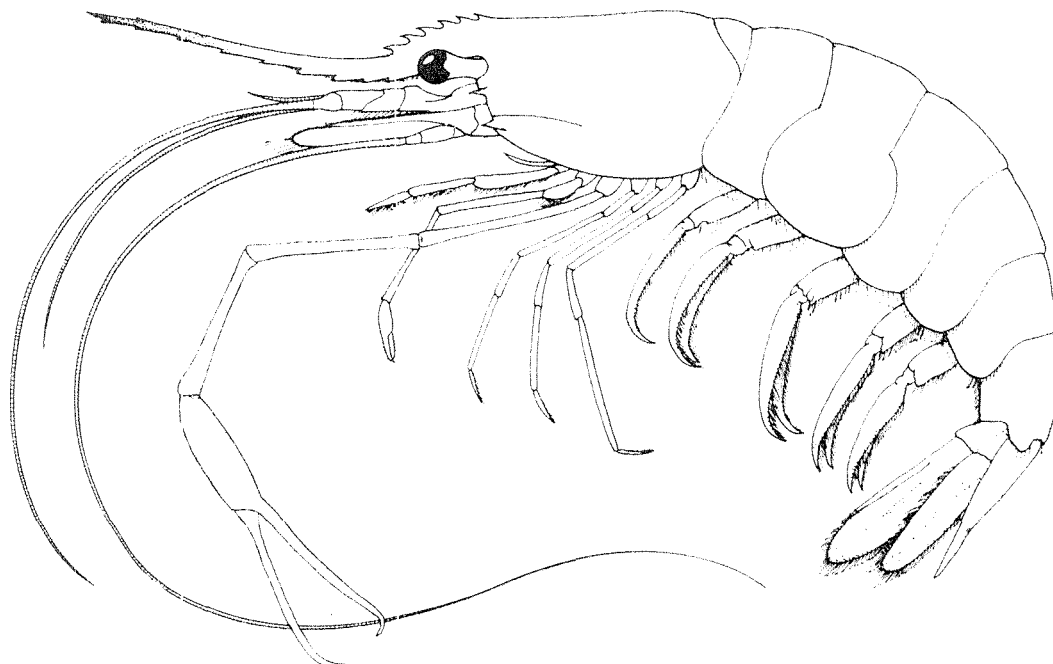
## PALAEMONIDAE

## Palaemonid shrimps

Small to moderate-sized shrimps, a few species large. Carapace cylindrical with a prominent laterally compressed rostrum carrying dorsal and ventral teeth. Anterior margin of carapace with an antennal and a branchiostegal spine, the latter sometimes replaced by a hepatic spine; rarely neither branchiostegal nor hepatic spines present. Pleura of second abdominal segment wide and covering both those of first and third somites. Telson elongate, with 2 pairs of dorsal spines and 2 or 3 pairs of posterior spines. First and second pairs of pereopods with pincers. First pair of pereopods shorter and more slender than second; pincers well developed, normal. Second pair of pereopods more robust than first, often very long and strong in adult males; pincers normal, carpus and merus not subdivided. Last 3 pereopods simple without pincers. Exopods on none of the legs. Males without petasma, females without thelycum. Males with an appendix masculine and an appendix interna on the endopods of second pleopods.

All species in the juvenile stage and many also as adults are translucent, often with dark lines or spots chromatophores). Large specimens sometimes more opaque and darker coloured.

The family consists of 4 subfamilies, of which only 2 occur in the area and only 1 is of commercial interest, namely the subfamily Palaemoninae. The other subfamily occurring in Fishing Area 51, the Pontoniinae, includes only small (generally less than 3 cm in total length) and usually commensal shrimps.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

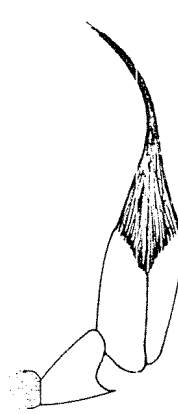
Superfamily Oplophoridae: pereopods usually with exopods; if not, fingers of pincers with terminal brushes of long hair (family Atyidae).

Superfamily Pasiphaeoidea: cutting edge of fingers of all pincers pectinate.

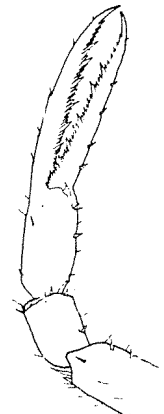
Superfamily Crangonoidea: first pair of pereopods subchelate.

Other carideans present in the catches: carpus of second pair of pereopods subdivided.

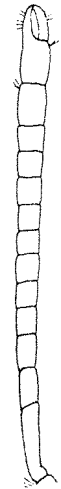
Families of the Infraorder Penaeidea: pleura of second abdominal segment not overlapping those of first; 3 first pairs of pereopods ending in pincers.



Atyidae



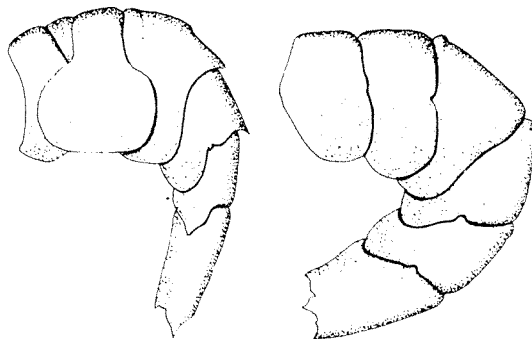
Pasiphaeoidea



Other caridean families



Crangonoidea



Caridea

Penaeidea  
abdomen

**KEY TO GENERA OF PALAEMONINAE OCCURRING IN THE AREA:**

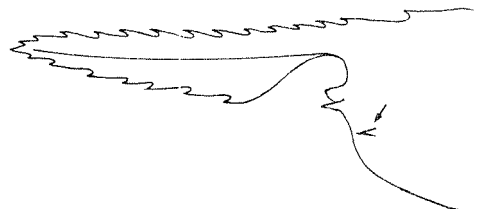
1a. Branchiostegal spine present, situated on, or slightly behind, anterior margin of carapace (Fig. 1)

2a. Endopods of first pleopods of male with appendix interna (Fig. 2); fifth pair of pereopods without transverse rows of hairs in distal part of propodus

3a. Mandible with a palp (Fig. 3) ..... Leander

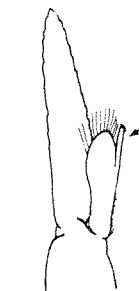
3b. Mandible without a pale ..... Leandrites

2b. Endopod of first pleopod of male without well developed appendix interna; fifth pair of pereopods with transverse rows of hairs on distal part of posterior margin (Fig. 4)

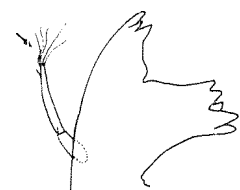


Leander

Fig.1

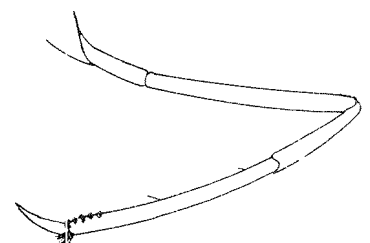


Endopod of  
first pleopod  
Fig. 2



mandible

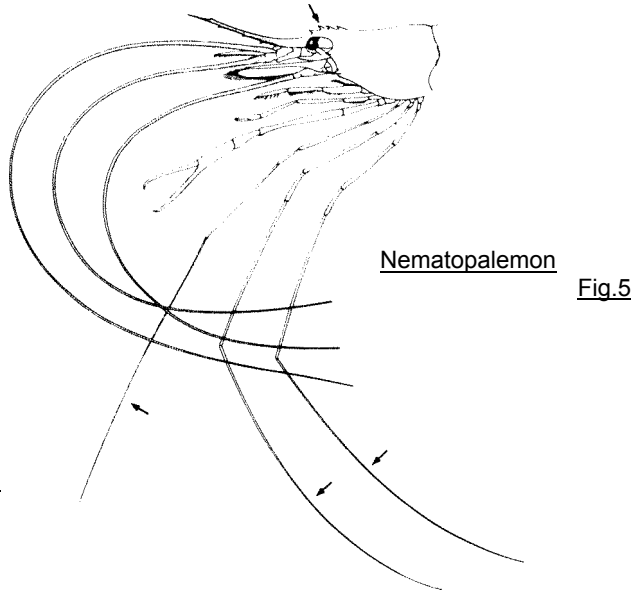
Fig.3



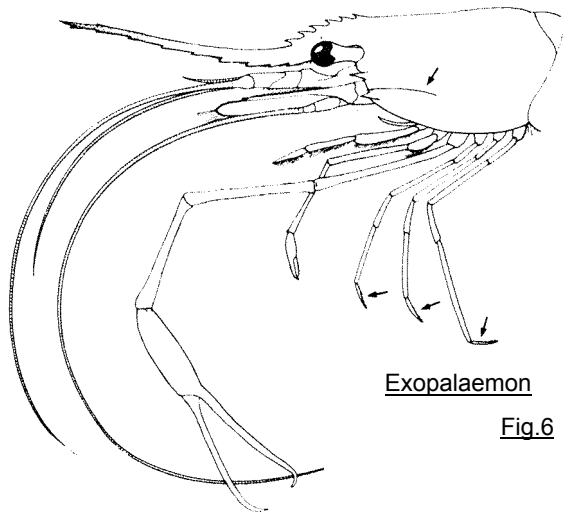
fifth pereopod

Fig.4

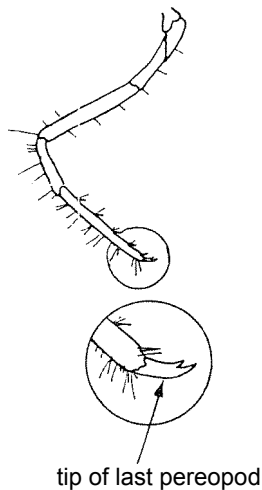
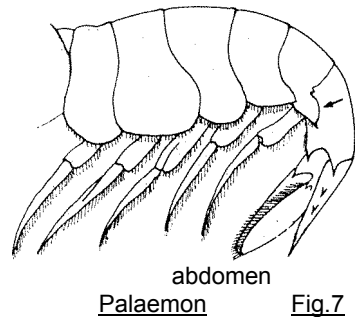
- 4a. Rostrum with an elevated basal dorsal crest of teeth (Fig.5); pleura of fifth abdominal segment rounded
- 5a. Dactyls of last 3 pairs of pereopods very strongly lengthened, longer than carpus and propodus together; branchiostegal groove absent from carapace (Fig. 5) ..... Nematopalaemon
- 5b. Dactyls of last 3 pairs of pereopods always shorter than propodus; branchiostegal groove present on carapace (Fig. 6) ..... Exopalaemon



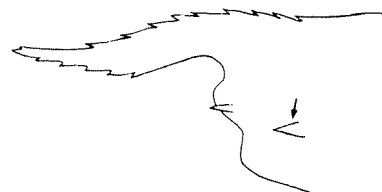
- 4b. Rostrum without an elevated basal dorsal crest of teeth; pleura of fifth abdominal segment ending in a tooth (Fig. 7)
- 6a. Mandibular palp present (Fig.3) ... Palaemon
- 6b. Mandibular palp absent ..... Palaemonetes



- 1b. Branchiostegal spine absent, anterior margin of carapace below antennal spine unarmed
- 7a. Both hepatic and branchiostegal spines absent ..... Leptocarpus
- 7b. Hepatic spine present, branchiostegal spine absent (Fig. 8)
- 8a. Dactyls of last 3 pairs of pereopods simple .. Macrobrachium
- 8b. Dactyls of last 3 pairs of pereopods bifid (Fig.9). Brachycarpus



Brachycarpus Fig.9



Macrobrachium Fig.8



**LIST OF SPECIES OCCURRING IN THE AREA: \***

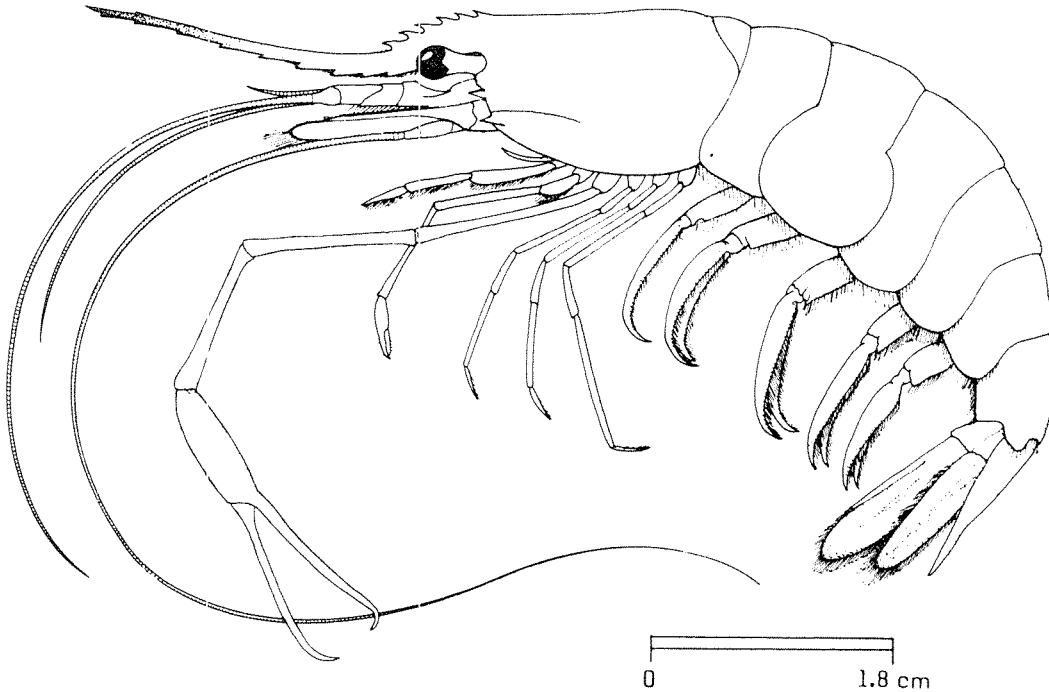
Code numbers are given for those species for which Identification Sheets are included:

<u>Exopalaemon styliferus</u> (H. Milne Edwards, 1.840)	PALAEM Exo 6
<u>Leptocarpus potamiscus</u> (Kemp, 1917)	
<u>Macrobrachium australe</u> (Guérin, 1838)	
<u>Macrobrachium equidens</u> (Dana, 1852)	PALAEM Macro 12
<u>Macrobrachium idae</u> Heller, 1862)	
<u>Macrobrachium lar</u> (Fabricius, 1798)	
<u>Macrobrachium malcolmsonii</u> (H. Milne Edwards, 1844)	PALAEM Macro 33
<u>Macrobrachium rosenbergii</u> (De Man, 1879)	PALAEM Macro 42
<u>Macrobrachium rude</u> (Heller, 1862)	PALAEM Macro 43
<u>Macrobrachium scabriculum</u> (Heller, 1862)	
<u>Nematopalaemon tenuipes</u> (Henderson, 1893)	PALAEM Nemat 3
<u>Palaemon concinnus</u> Dana, 1852	
<u>Palaemon pacificus</u> (Stimpson, 1860)	

\* Only the marine and brackish water species that may be found in fishmarkets are listed.

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALAEMONIDAE

FISHING AREA 51  
(W. Indian Ocean)Exopalaemon styliferus (H. Milne Edwards, 1840)OTHER SCIENTIFIC NAMES STILL IN USE: Palaemon styliferus H. Milne Edwards, 1840  
Leander styliferus (H. Milne Edwards, 1840)

## VERNACULAR NAMES:

FAO : En - Roshna prawn  
Fr - Bouquet rosna  
Sp - Camarón rosna

NATIONAL:

## DISTINCTIVE CHARACTERS:

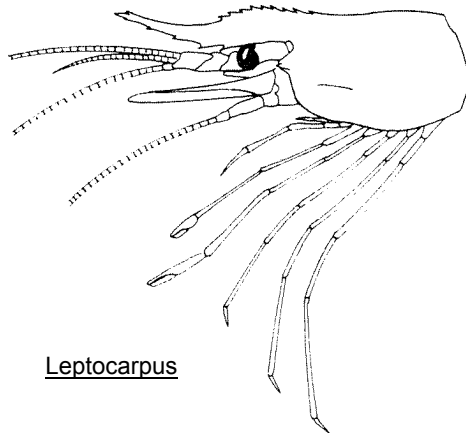
Rostrum long and slender, with an elevated basal crest of 5 to 7 teeth over the eye; most of distal part of dorsal margin toothless, save for 1 or 2 subdistal teeth; ventral margin with 6 to 10 teeth. Branchiostegal spine and branchiostegal groove present. Abdominal segments dorsally rounded, without crest. Pleura of fifth abdominal segment rounded. Second pair of pereopods longer and stronger than first, fingers of the pincer longer than palm, the latter slightly swollen. Dactyls of fifth pair of pereopods about 1/3 as long as propodus.

Colour: whitish translucent, with distal part of rostrum dark reddish brown and some darker spots on tips of uropods and telson. Ovigerous females with large dark spots on first 4 abdominal pleura. Eggs of berried females yellowish.

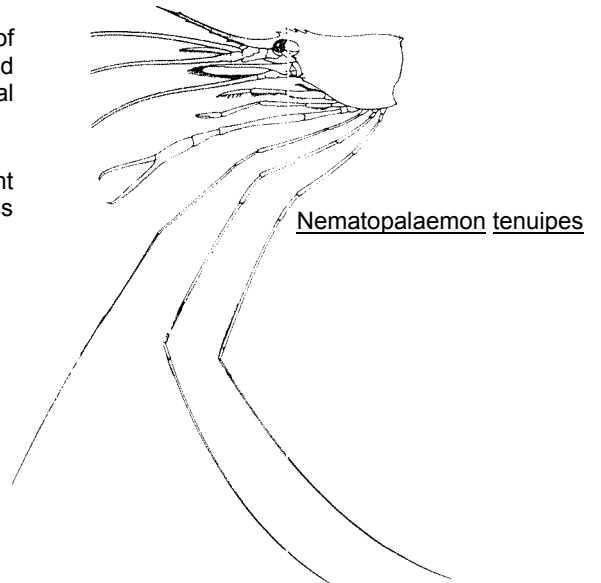
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Nematopalaemon tenuipes: dactyls of last 3 pairs of pereopods much longer than propodus and carpus combined (dactyls shorter than propodus in E. styliferus); branchiostegal groove absent (present in E. styliferus).

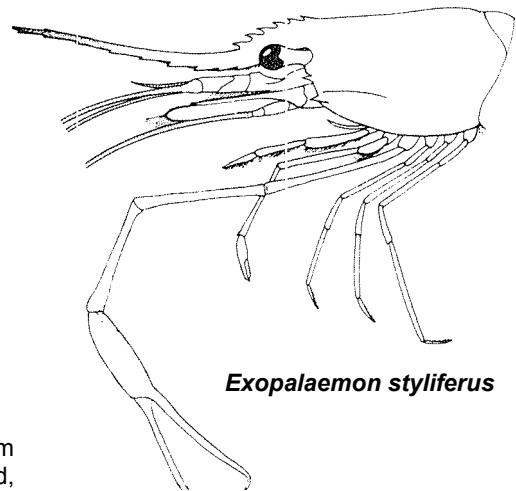
Species of Leptocarpus: branchiostegal spine absent (present in E. styliferus); dactyls of last pair of pereopods less than 1/4 of propodus.



Leptocarpus



Nematopalaemon tenuipes



Exopalaemon styliferus

## SIZE:

Maximum total length: males, 9 cm; females, 8.6 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs in the Arabian Sea from Pakistan to south India. Further east, it extends to Thailand, north coast of Borneo and Indonesia.

Inhabits shallow marine or brackish coastal waters; seldom found in freshwater.

## PRESENT FISHING GROUNDS:

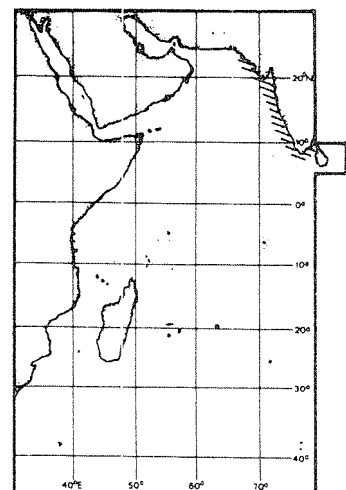
Abundantly fished and of major importance in the central and north-west coast of India (Gujarat and Maharashtra).

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species by FAO.

Caught with barrier and stake nets, bag nets, shore seines, boat seines and cast nets.

Marketed mainly fresh, dried or as shrimp paste.

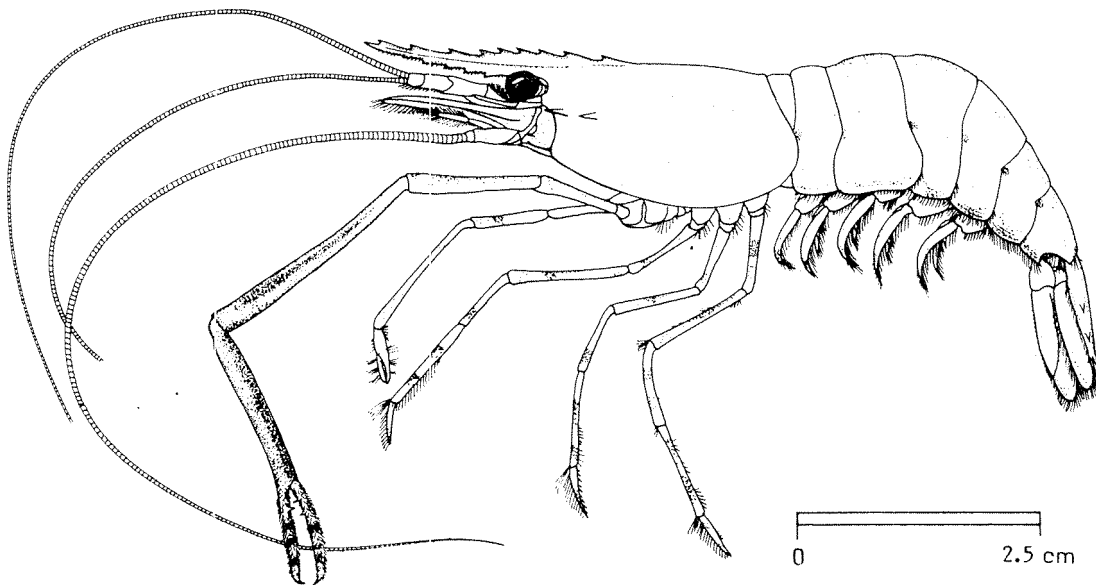


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALAEMONIDAE

FISHING AREA 51  
(W. Indian Ocean)*Macrobrachium equidens* (Dana, 1852)

## OTHER SCIENTIFIC NAMES STILL IN USE:

This species is often indicated as "*Palaemon sundaicus*"  
(*Palaemon sundaicus* auct. non Heller, 1862)

## VERNACULAR NAMES:

FAO: En - Rough river prawn  
Fr - Bouquet chagrin  
Sp - Camarón lija

NATIONAL

## DISTINCTIVE CHARACTERS:

Rostrum rather long, reaching to about end of antennal scale its distal art usually upcurved and not strongly narrowed; dorsal margin armed with 9 to 13 usually 10 or 11 teeth, usually placed at regular intervals, the posterior 2 or 3 behind the orbital margin; ventral margin armed with 4 to 7, usually 5, teeth. Hepatic spine located on horizontal line through antennal spine; the ridge of antennal spine extending in the direction of hepatic spine. Posterior margin of telson distinct, with 2 pairs of spines, inner air reaching distinctly beyond the acute median angle of the margin. In adult males, carapace (especially anterolateral part rough by the presence of minute spinules; second pair of pereopods long and strong, the fingers, but not the other parts, covered by a dense velvety pubescence; 1 or 2 enlarged proximal teeth on cutting edges of fingers, rest of the edges entire and no rows of granules at either side of the edges; carpus shorter than propodus and distinctly longer than merus.

Colour: translucent, marbled or spotted with greyish, greenish or reddish. Second pair of pereopods, and especially the palms, marbled with dark brownish (tortoise shell-like).

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Macrobrachium rosenbergii: rostrum longer, usually reaching distinctly beyond the antennal scale, and with 8 to 14 ventral teeth (reaching to about end of antennal scale and with 4 to 7, usually 5, ventral teeth in M. equidens); telson tapering regularly to a sharp point, its tip overreaching posterolateral spines (telson with distinct posterior margin and with 2 pairs of spines, the inner one overreaching posteromedian angle of telson in M. equidens).

Macrobrachium rude: rostrum usually straight and distinctly narrowing distally (tip upcurved and more uniform in height in M. equidens); hepatic spine situated at a lower level than antennal spine both on a horizontal line in M. equidens); second pair of pereopod of adult male pubescent throughout.

Macrobrachium australe: antennal and hepatic spine not on same horizontal line; second pair of pereopods of adult male with numerous teeth over the entire cutting edge (only 1 or 2 proximal teeth in M. equidens, the rest of the edge is entire); fingers hairless, but palm of the smaller leg of second pair is pubescent.

### SIZE:

Maximum total length: 9.8 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, the species occurs from east Pakistan to south India and Sri Lanka; also present in Madagascar; records of the species from the east coast of Africa mostly pertain to Macrobrachium rude. Further east, it extends as far as China, the Philippines and New Caledonia.

Inhabits rivers and estuarine areas (fresh and brackish waters).

### PRESENT FISHING GROUNDS:

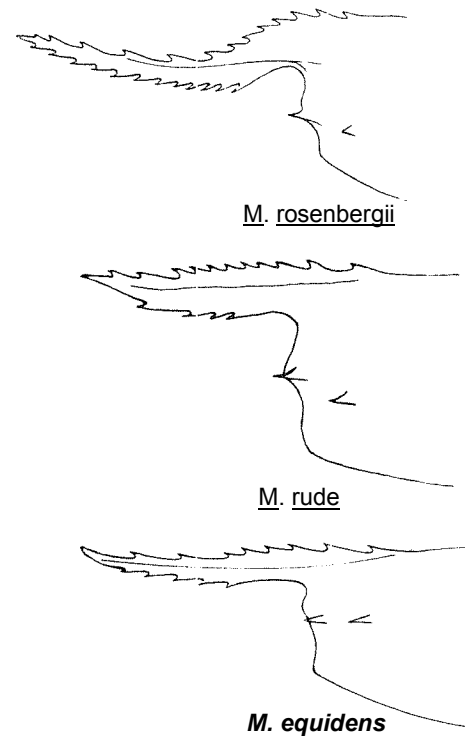
Fished in small numbers along the Indian coast and off Sri Lanka.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

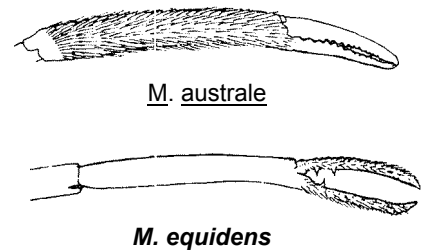
Separate statistics are not reported for this species.

Caught mainly with traps and cast nets.

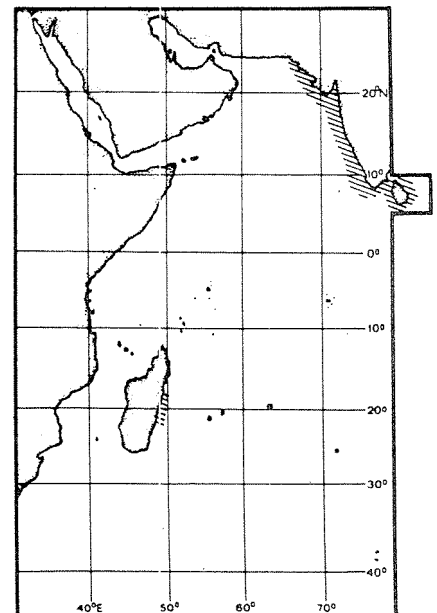
Marketed fresh or dried.



Anterior part of carapace



smaller second pereopod in males

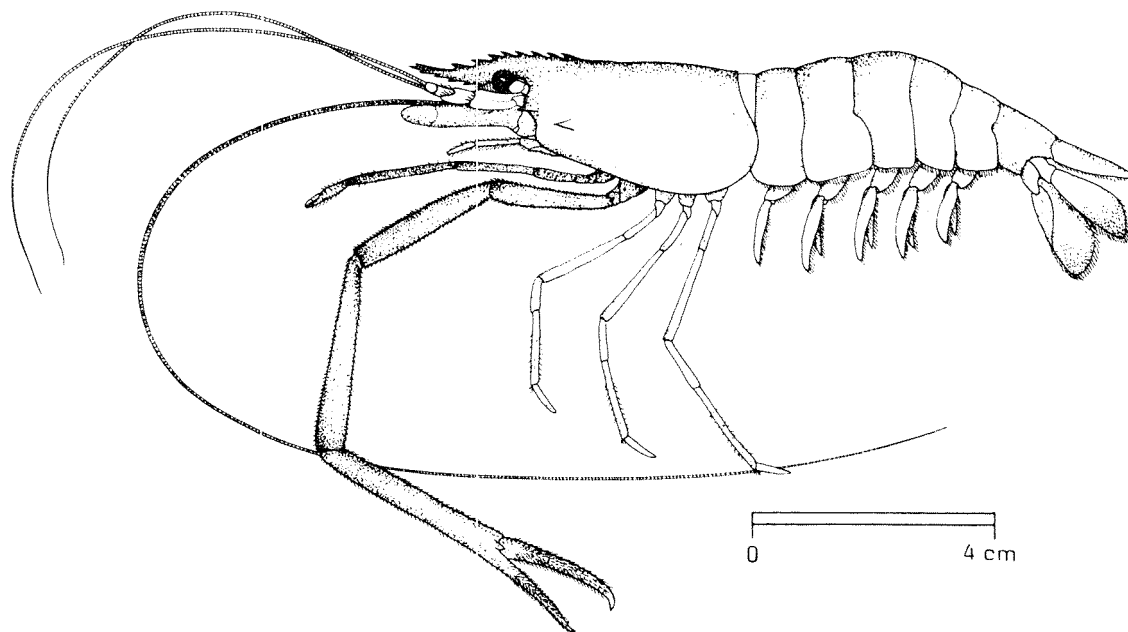


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALAEMONIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Macrobrachium malcolmsonii</i> (H. Milne Edwards, 1844)
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OTHER SCIENTIFIC NAMES STILL IN USE: *Palaemon malcolmsonii* H. Milne Edwards, 1844

## VERNACULAR NAMES:

FAO :           En - Monsoon river prawn  
                   Fr - Bouquet mousson  
                   Sp - Camarón monzón

NATIONAL:

## DISTINCTIVE CHARACTERS:

Rostrum rather long, reaching to about end of antennal scale, its tip slightly upcurved; basal part of dorsal margin rather high and crest-like, armed with 7 to 11 teeth of which the posterior 2 or 3 are placed behind the orbital margin; distal part of dorsal margin toothless, except for 1 or 2 (sometimes up to 4) subdistal teeth; ventral margin with 4 to 7, usually 6, teeth. Hepatic spine situated at a lower level than antennal spine, not on the same horizontal line. Second pair of pereopods robust and equal in size; carpus slightly, but distinctly longer than merus, 1 or 2 larger basal teeth on cutting edges of fingers, no teeth on distal part of cutting edges and no tubercles in a row on either side of the edges, Telson gradually tapering to a sharp point, without posterior margin, tip of telson overreaching posterolateral spines. In adult males, carapace with spinules anteriorly; second air of pereopods with a very short pubescence which is especially distinct on the movable finger (except at its tip). Carpus shorter than propodus.

Colour: body and anterior two pairs of pereopods (chelipeds) dark grey, paler ventrally; antennae and inner flagella of antennules grey; outer flagella brownish.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Macrobrachium rosenbergii: rostrum longer, usually reaching distinctly beyond the antennal scale and with 8 to 14 ventral teeth (reaching to about end of antennal scale and with 4 to 7, usually 6, ventral teeth in M. malcolmsonii).

Other species of Macrobrachium entering catches: rostrum without basal crest and with teeth on upper margin usually placed at almost equal intervals (with basal crest and dorsal teeth unevenly spaced in M. malcolmsonii); telson with a distinct posterior margin (gradually tapering to a sharp point in M. malcolmsonii); different pattern of pubescence on largest pereopods.

**SIZE:**

Maximum total length. males, 23 cm; females, 20 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, it occurs in Pakistan, along the west coast of India and in Sri Lanka; the species is also present along the east coast of India and Bangladesh.

Essentially an inhabitant of flowing waters such as rivers and estuarine areas (fresh and brackish waters); requires brackish water for spawning and nursing up to the postlarval stage; adults are bottom-feeders (organic matter, detritus).

**PRESENT FISHING GROUNDS:**

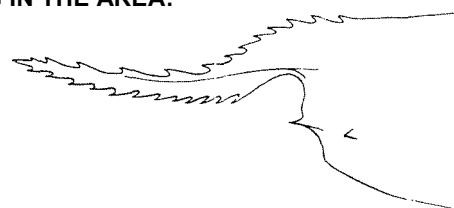
Exploited in east Pakistan (Indus delta and river) and along the west coast of India in rivers and estuarine areas.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

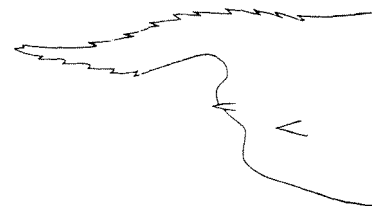
Separate statistics are not reported for this species by FAO; statistics often include catches from brackish water as well as from fresh water.

Caught with bamboo barriers and traps, set nets, cast nets and hook and line.

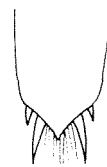
Marketed fresh or frozen.



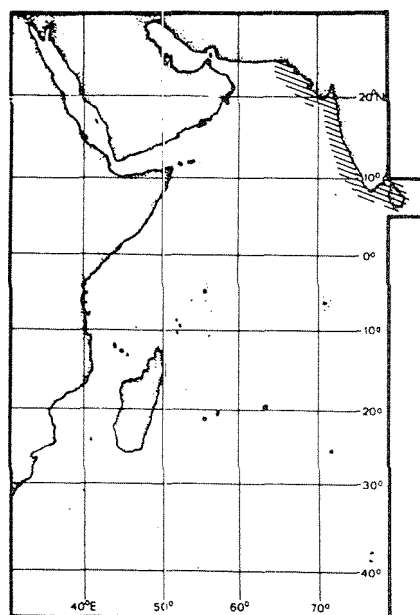
M. rosenbergii  
anterior part of carapace



**M. malcolmsonii**  
anterior part of carapace



M. equidens      **M. malcolmsonii**  
tip of telson

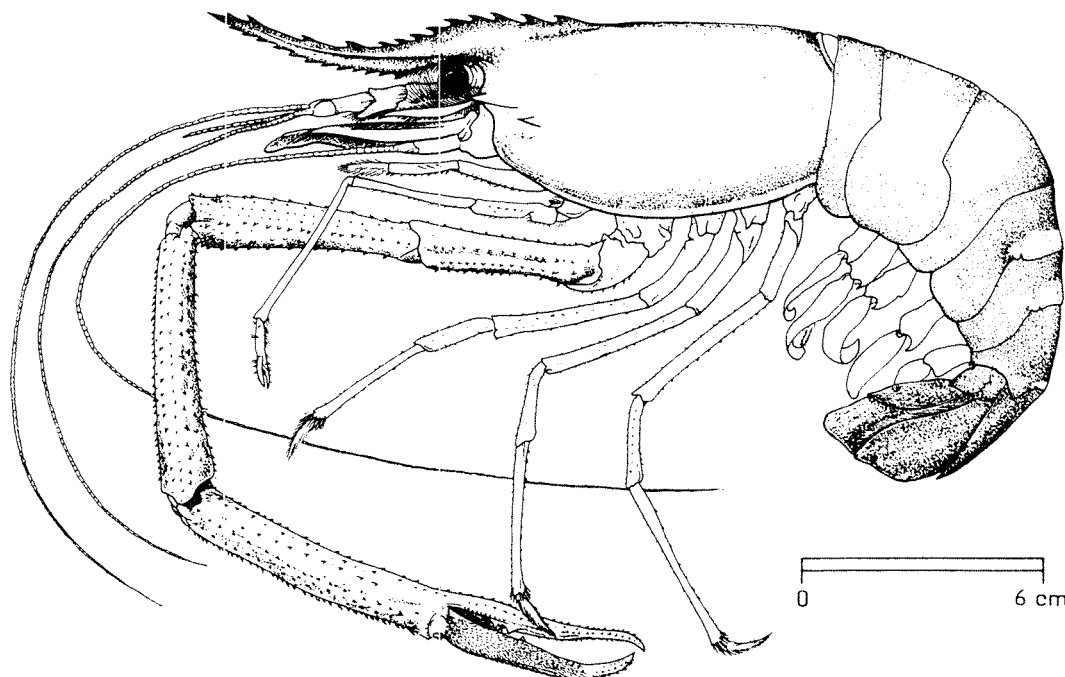


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALAEMONIDAE

FISHING AREA 51  
(W. Indian Ocean)Macrobrachium rosenbergii (De Man, 1879)

**OTHER SCIENTIFIC NAMES STILL IN USE:** The species is often indicated as "Palaemon carcinus"  
(Palaemon carcinus auct. non (Linnaeus, 1758))

**VERNACULAR NAMES:**

FAO : En - Giant river prawn  
Fr - Bouquet géant  
Sp - Camarón gigante

NATIONAL:

**DISTINCTIVE CHARACTERS:**

Rostrum long and slender, usually extending distinctly beyond the antennal scale (especially in younger specimens); dorsal margin armed with 11 to 14 teeth, of which the posterior 2 or 3 are placed behind the orbital margin, 9 or 10 forming an elevated basal crest; most of distal part of dorsal margin toothless or with only a few teeth (including 1 or 2 subdistal teeth); ventral margin armed with 8 to 14 teeth. Hepatic spine situated distinctly below antennal spine, not on same horizontal line. Second pair of pereopods robust and of same size, with the Carpus longer than the merus. Telson regularly tapering to a sharp point, without a posterior margin, tip overreaching posterolateral spines. In adult, male, carapace smooth, second pair of pereopods spinous, cutting edges of fingers with 1 or 2 large proximal teeth, rest of the edges entire without rows of tubercles at either side; movable finger with a dense velvety pubescence, covering it entirely except for the distal end, no pubescence on the rest of these legs except for scattered hairs. Carpus shorter than propodus.

Colour: dark grey, sometimes with longitudinal or irregular streaks of darker and lighter colour; often orange patches at the articulations of abdominal somites. Largest pereopods of adult male bright or dark blue or lavender, orange at the joints, their pubescence grey. Eggs of berried females yellow.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Macrobrachium malcolmsonii: rostrum shorter, reaching to about end of antennal scale, and with 4 to 7, usually 6, ventral teeth (rostrum usually extending distinctly beyond antennal scale and with 8 to 14 ventral teeth in M. rosenbergii).

Other species of Macrobrachium: smaller, with a shorter rostrum and fewer ventral teeth on it. Furthermore, in all other species entering the catches, the telson has a distinct posterior margin, with the posterior spines overreaching the tip (telson tapering to a sharp point in M. rosenbergii, its tip overreaching the spines).

### SIZE:

Maximum total length: males, 34 cm; females, 26 cm; this is the largest species of Palaemonidae.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, the species ranges from east Pakistan to south India and Sri Lanka. Further east, it extends as far as south China, the Philippines and New Guinea. The species has been introduced in Mauritius. The species is used for aquaculture in many areas of the world.

Found mainly in estuarine areas and rivers (brackish and freshwaters) but sometimes also found at sea; it requires brackish water for spawning and nursing up to the postlarval stage; juveniles are caught mostly in freshwater zones. The species is omnivorous.

### PRESENT FISHING GROUNDS:

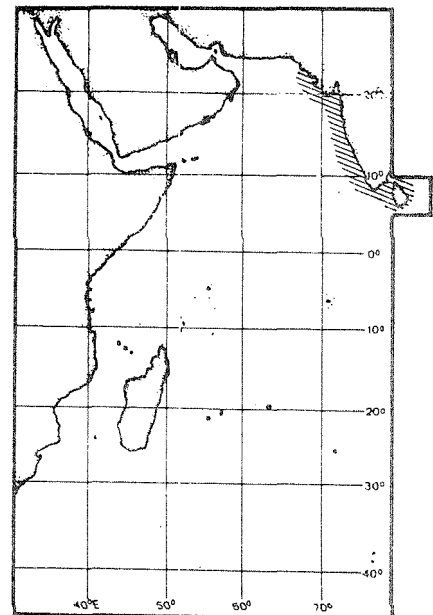
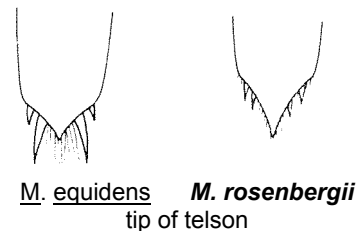
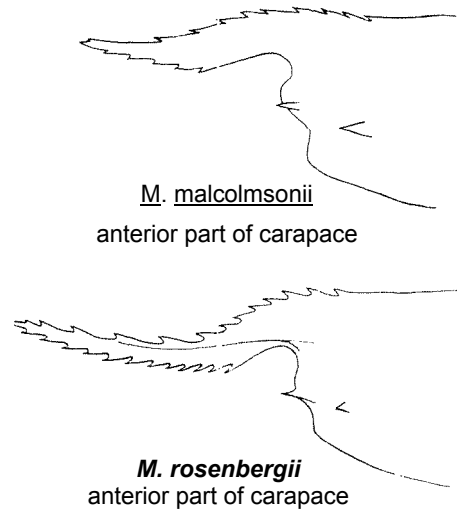
Fished in Pakistan (Indus River region) and along the west coast of India where it is exploited in several estuarine areas.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species by FAO; statistics often include catches from brackish water as well as from fresh water.

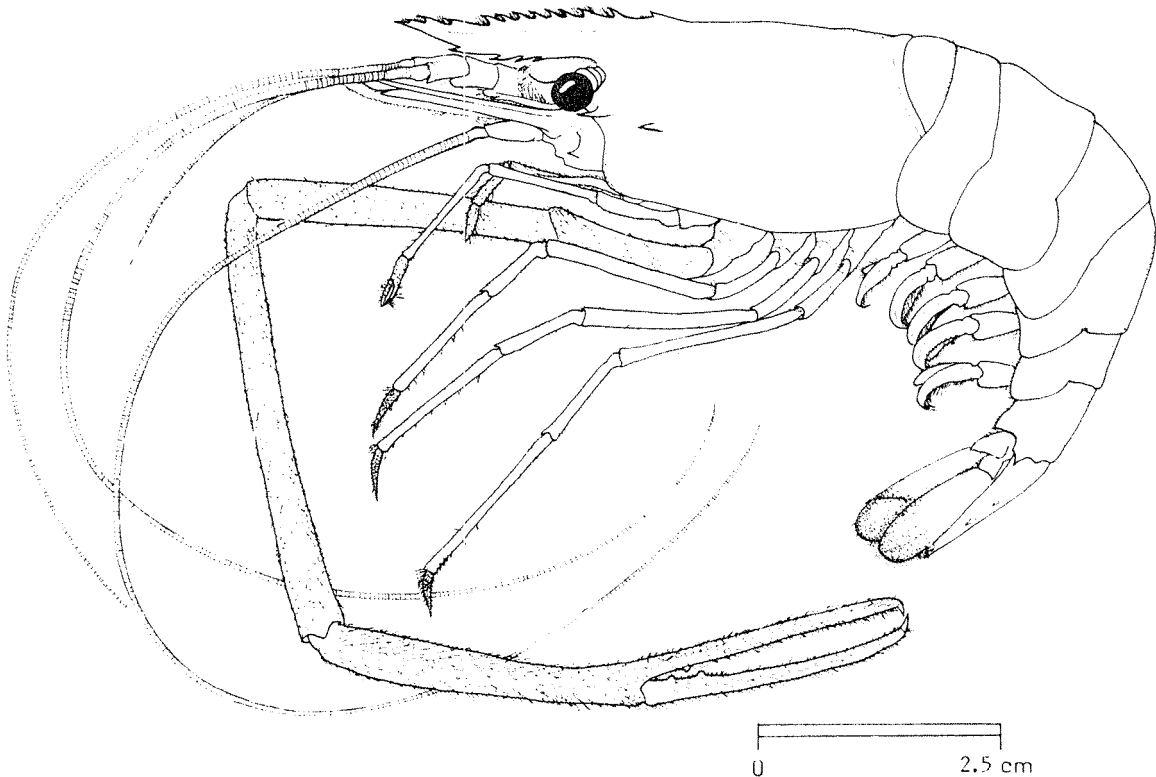
Caught with bamboo barriers and traps, bag nets (dol nets) and set nets, cast nets, lift nets and hook and lines.

Marketed fresh or frozen.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALAEMONIDAE

FISHING AREA 51  
(W. Indian Ocean)Macrobrachium rude (Heller, 1862)OTHER SCIENTIFIC NAMES STILL IN USE: Palaemon rudis Heller, 1862

## VERNACULAR NAMES:

FAO :           En - Hairy river prawn  
                   Fr - Bouquet velu  
                   Sp - Camarón de cerda

NATIONAL:

## DISTINCTIVE CHARACTERS:

Rostrum straight and rather long, reaching almost to the end of antennal scale, rather high at base, tapering distally; dorsal margin armed with 10 to 17 (usually 10 to 15) teeth, placed at regular intervals, the posterior 2 behind the orbital margin; ventral margin with 3 to 8 (usually 3 to 6) teeth. Hepatic spine situated at lower level than antennal spine, not placed on same horizontal line. Posterior margin of telson distinct, with 2 pairs of spines. In adult males, carapace, especially the anterior part, with very short, stiff hair, without spinules; second pair of pereopods very long and heavy, all segments covered with a short and dense pubescence; cutting edges of fingers with 1 or 2 large proximal teeth, rest of the edges entire, but with a row of granules at each side, carpes shorter than propodus and much longer than merus.

Colour: translucent., with the largest legs of the male rather uniformly dark reddish brown; tips of pereopods and distal half of uropods dark brownish.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Macrobrachium equidens: rostrum upcurved at tip and more uniform in height throughout (usually straight and distinctly narrowing distally in M. rude); antennal and hepatic spines at same level (antennal spine at a lower level than hepatic spine in M. rude); largest pereopods of adult male with only the fingers pubescent.

Macrobrachium rosenbergii: rostrum longer, usually reaching distinctly beyond the antennal scale, more slender, with a basal dorsal crest and 8 to 14 ventral teeth (reaching almost to the end of antennal scale, straight and with 3 to 8, usually 3 to 6, ventral teeth in M. rude); telson tapering regularly to a sharp point (with a distinct posterior margin in M. rude); largest pereopods of adult male with only the greater part of the dactyls pubescent.

**SIZE:**

Maximum total length: about 13 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, the species is known from the east coast of Africa from south Somalia to Natal (South Africa), Madagascar, Sri Lanka and south India. Also occurring on the east coast of India and Bangladesh.

Inhabits rivers and estuarine areas (fresh and brackish waters); omnivorous with some preference for crustaceans.

**PRESENT FISHING GROUNDS:**

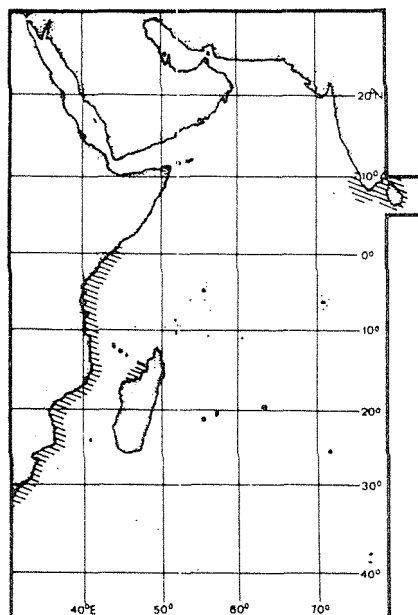
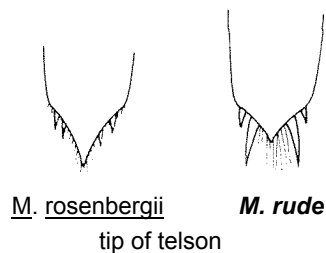
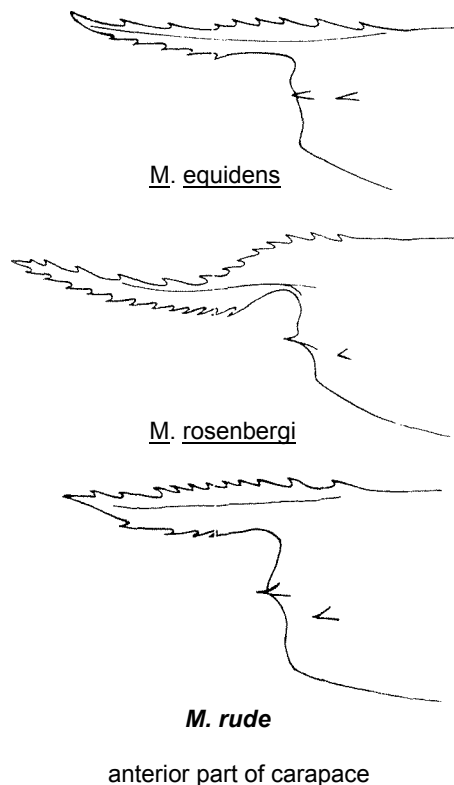
Fished in small quantities in the estuaries along the east African coast (Kenya, Tanzania).

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with traps, barrier nets and other set nets, shore seines, cast nets and push nets.

Marketed mainly fresh or dried.

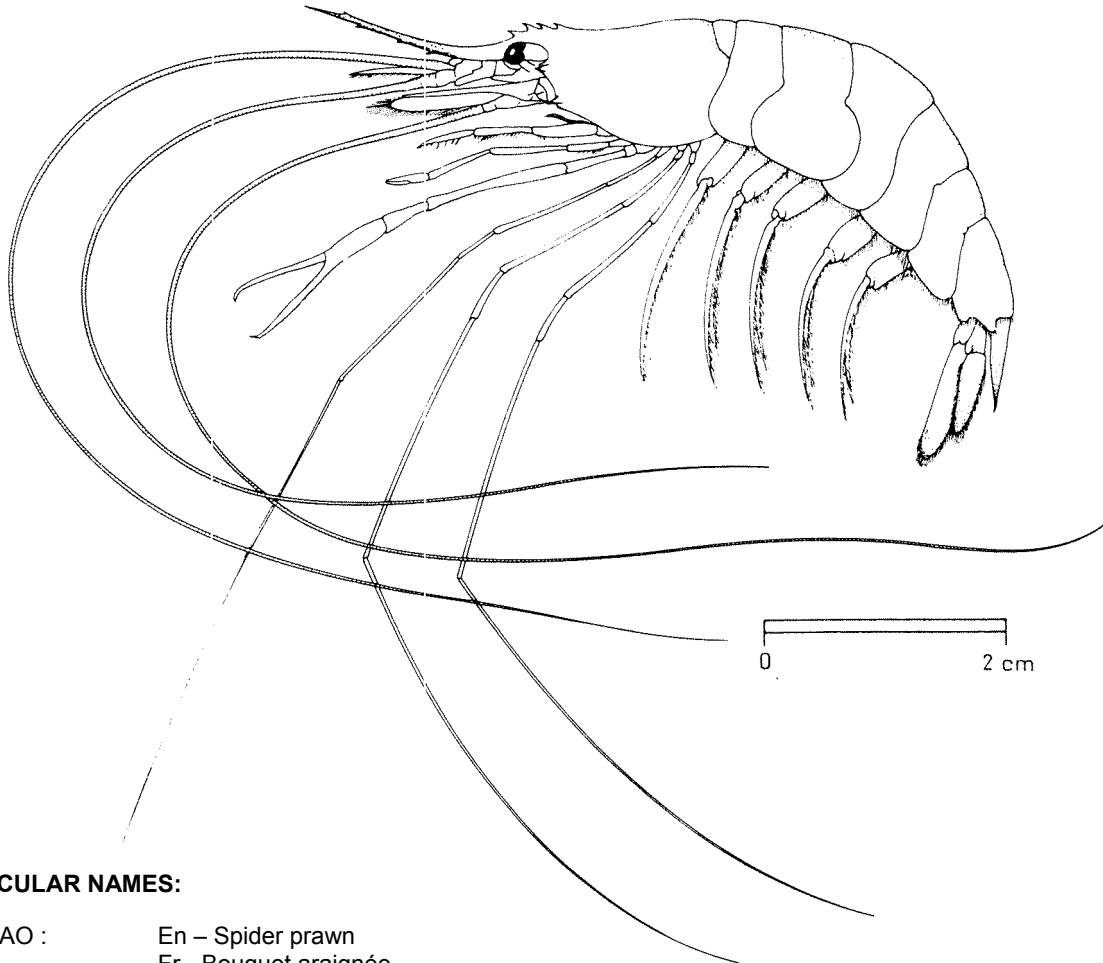


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PALAEMONIDAE

FISHING AREA 51  
(W. Indian Ocean)Nematopalaemon tenuipes (Henderson, 1893)

OTHER SCIENTIFIC NAMES STILL IN USE:

Leander tenuipes Henderson, 1893Palaemon tenuipes (Henderson, 1893)

## VERNACULAR NAMES:

FAO :           En – Spider prawn  
                   Fr - Bouquet araignée  
                   Sp - Camarón araña

NATIONAL:

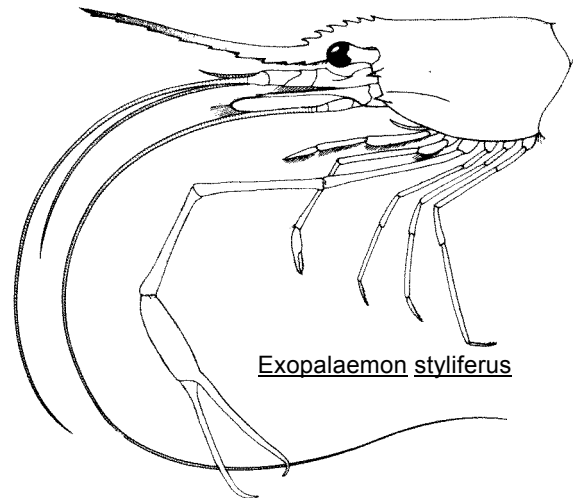
## DISTINCTIVE CHARACTERS:

Rostrum long and slender, with an elevated basal crest of 4 to 7 teeth over the eye; most of distal part of dorsal margin toothless save for a small subdistal tooth; ventral margin with 2 to 6 teeth. Branchiostegal spine present, but branchiostegal groove absent. Abdomen with all segments dorsally rounded, not carinate. Second pair of pereopods longer and stronger than first, fingers of pincer longer than palm, the latter slightly swollen. Dactyls of third to fifth pairs of pereopods extremely long and thin, far longer than propodus and carpus combined.

Colour: whitish translucent with distal part of rostrum dark reddish brown; some reddish brown colour on antennae, antennules and distal margins of uropods and telson; also a reddish brown spot on bases of uropods.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Species of Palaemon, Exopalaemon and Leptocarpus: dactyls of last 3 pairs of legs much shorter than propodus far longer than propodus and corpus combined in N. tenuipes); a branchiostegal groove present on carapace (absent in N. tenuipes).



### SIZE:

Maximum total length: 8 cm.

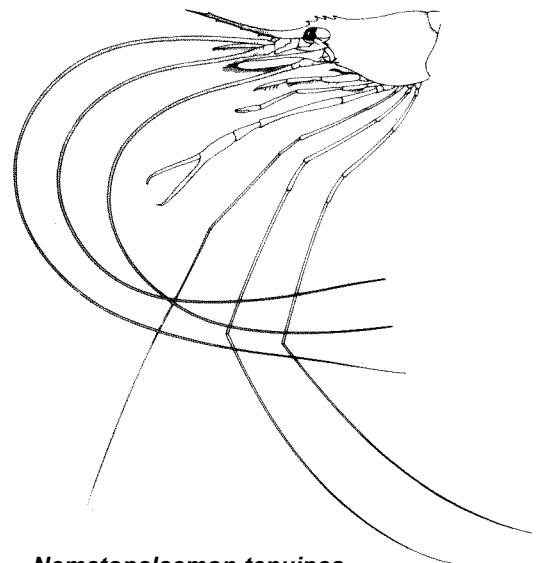
### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs along the east African coast from South Africa to Somalia and along the east coast of the Arabian Sea from Pakistan to south India. To the east, it extends as far as Viet Nam, the Philippines and New Guinea.

Inhabits shallow coastal waters to depths of about 20 m as well as in estuarine and brackish waters.

### PRESENT FISHING GROUNDS:

Abundantly fished and of major importance on the central and north-west coast of India (Gujarat, Maharashtra).



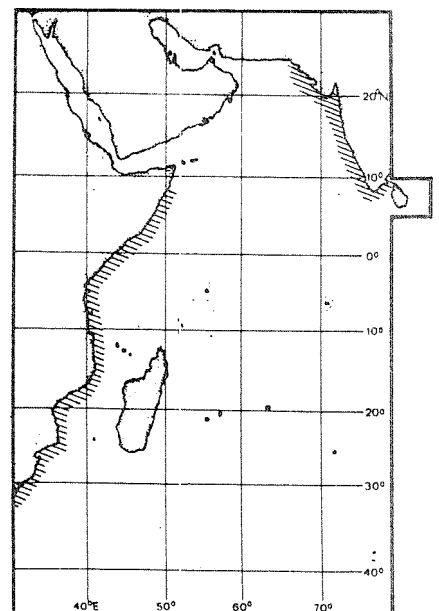
*Nematopalaemon tenuipes*

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species by FAO.

Caught with barrier and stake nets, bag nets, shore seines, boat seines and cast nets.

Marketed mainly fresh or dried; also sold as shrimp paste.



## FAO SPECIES IDENTIFICATION SHEETS

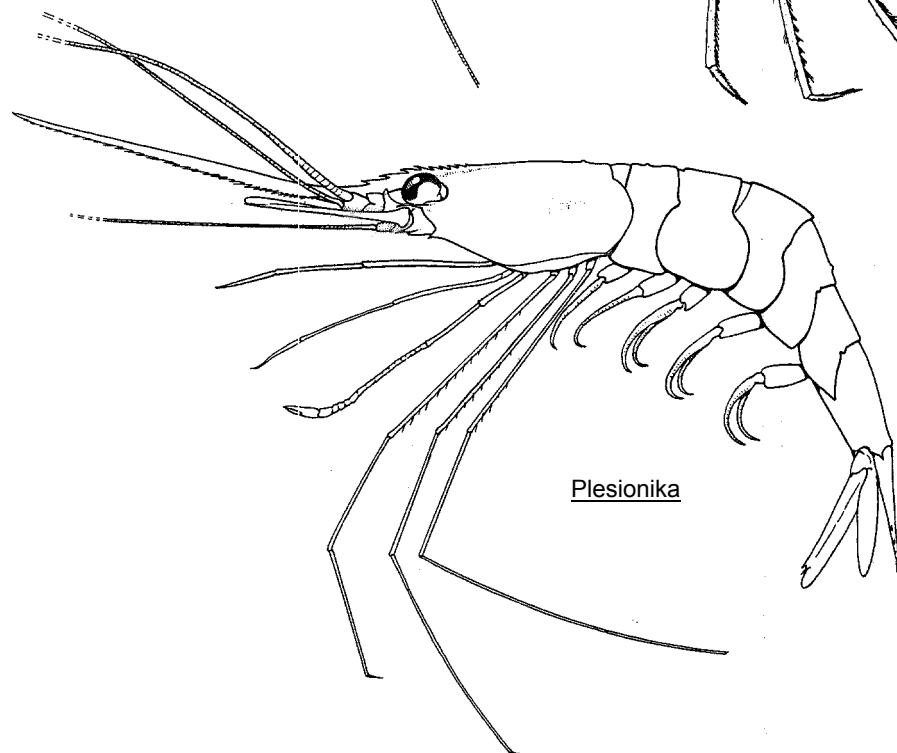
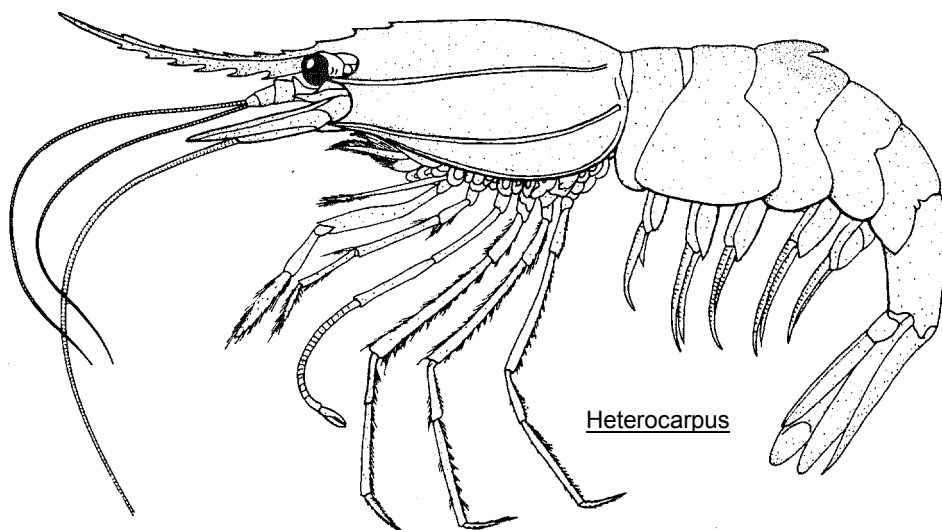
FISHING AREA 51  
(W. Indian Ocean)

## PANDALIDAE

## Pandalid shrimps

As in the other families belonging to the Infraorder Caridea, the pleura of second abdominal segment overlap those of first and third segments, and the third pair of pereopods lacks pincers. Rostrum longer than eyes, armed with dorsal and ventral teeth. First pair of pereopods ending in microscopically small pincers or pincers entirely lacking, legs slender, less heavy than any other pair. Carpus of second pair of pereopods divided into several, usually very many, articles.

All representatives of this family are marine. Within Fishing Area 51 they occur almost exclusively in deep waters. During exploratory surveys, species belonging to the genera Heterocarpus, Parapandalus and Plesionika have been found abundant enough as to be considered of potential interest to fisheries.

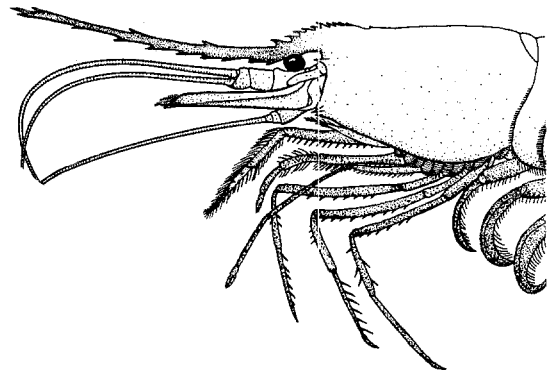


**SIMILAR FAMILIES OCCURRING IN THE AREA:**

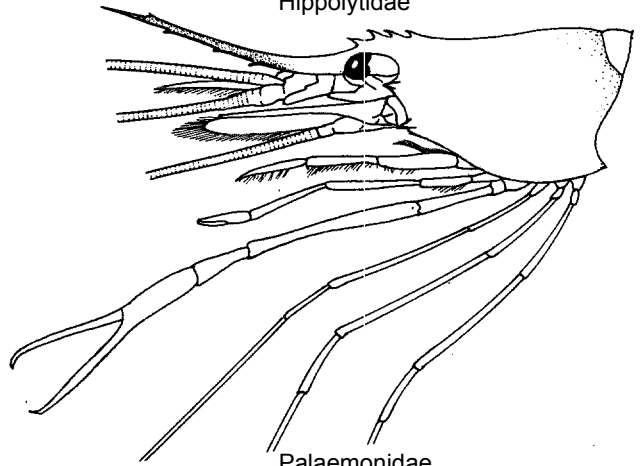
Hippolytidae and Alpheidae: first pair of pereopods with distinct pincers and more robust than following legs.

Palaemonidae: first pair of pereopods with distinct pincers; second pair with carpus not subdivided, pincers stronger and larger than those of first pair of pereopods.

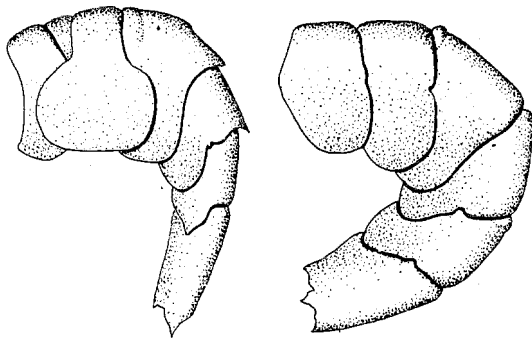
Families of the Infraorder Penaeidea: pleura of first abdominal segment overlapping those of second; 3 first pairs of pereopods ending in pincers.



Hippolytidae



Palaemonidae



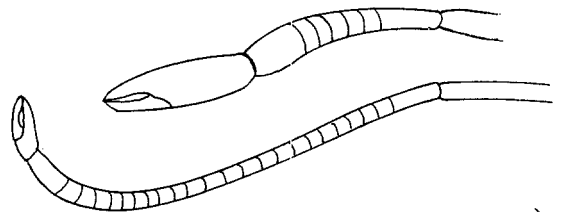
Caridea

Penaeidea

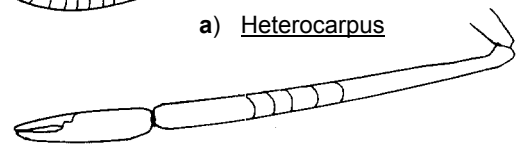
abdomen

**KEY TO GENERA OCCURRING IN THE AREA:**

- 1a. Carpus of second pair of pereopods subdivided into more than 3 segments (Fig. 1); maximum total length usually more than 10 cm except in Heterocarpoides
- 2a. Eyes well developed, the dark cornea much wider than the eyestalk
- 3a. Carapace with 1 or more longitudinal crests on sides (Fig. 2)
- 4a. Second pair of pereopods unequal, with at least 7 articles in the carpus (Fig. 1a); maximum total length more than 10 cm ..... Heterocarpus
- 4b. Second pair of pereopods equal, with only 6 articles in the carpus (Fig. 1b); maximum total length 5 cm ..... Heterocarpoides
- 3b. Carapace smooth, without conspicuous crests



a) Heterocarpus



b) Heterocarpoides  
distal part of second pereopods  
Fig. 1



Heterocarpus  
Fig. 2

- 5a. Epipods present on at least first 2 pairs of pereopods ..... Plesionika
- 5b. Epipods absent from all pereopods ...Parapandalus
- 2b. Eyes poorly developed, the dark cornea narrower than the eyestalk ..... Dorodotes
- 1b. Carpus of second legs subdivided into 2 or 3 segments; maximum total length less (often much less) than 8 cm ..... Other genera

**LIST OF SPECIES OF POTENTIAL COMMERCIAL VALUE OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are provided:

- Heterocarpus dorsalis Bate, 1888
- Heterocarpus ensifer A. Milne Edwards, 1881
- Heterocarpus gibbosus Bate, 1888
- Heterocarpus laevigaitus Bate, 1888
- Heterocarpus tricarinatus Alcock & Anderson, 1894
- Heterocarpus woodmasoni Alcock, 1901 PANDL Heter 9
- ? Parapandalus narval (Fabricius, 1787)
- Parapandalus spinipes (Bate, 1888)
- Plesionika alcocki (Anderson, 1896)
- Plesionika ensis A. Milne Edwards, 1881)
- Plesionika martia (A. Milne Edwards, 1883)

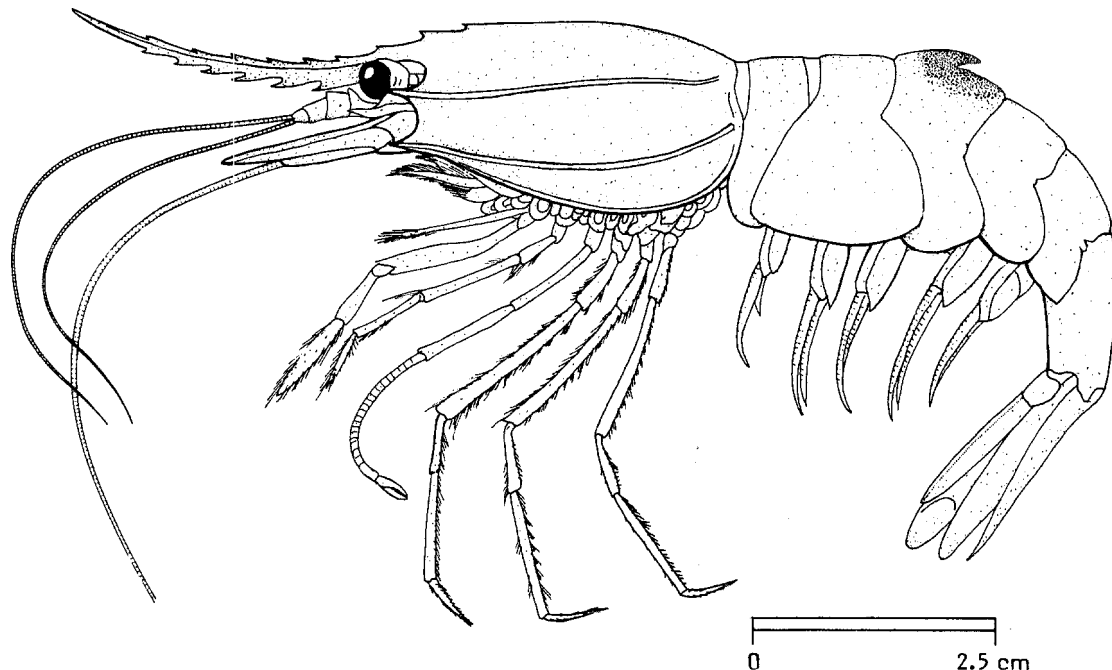


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PANDALIDAE

FISHING AREA 51  
(W. Indian Ocean)Heterocarpus woodmasoni Alcock, 1901

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Indian nylon shrimp  
Fr - Crevette nylon indienne  
Sp - Camarón nailón indio

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace with 2 longitudinal crests on each side, extending over the full length of carapace; one from the antennal spine backward, the other from the branchiostegal spine; no crest between postantennal crest and dorsal margin of carapace. Rostrum long, slightly curved, with 9 to 11 dorsal and 6 to 9 ventral teeth; dorsal teeth starting in anterior fourth of carapace; middorsal abdominal crest present from third to fifth segments, not ending in posterior spines; a conspicuous elevated, sharp tooth at middle of dorsal crest of third segment; sixth segment with 2 submedian dorsal crests. Second pair of pereopods unequal in size.

Colour: pink to red, with a very conspicuous, rounded, dark spot on the posterodorsal area of the third abdominal segment including the dorsal tooth.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

None of the other species of Heterocarpus and Heterocarpoides possess the striking dorsal tooth on the third abdominal segment. Further distinguishing characters of these species are:

Heterocarpus gibbosus, H. laevigatus and H. tricarinatus: postantennal crest very short but a well developed and long postocular crest (postantennal crest well developed and postocular crest lacking in H. woodmasoni).

H. dorsalis, H. ensifer and species of Heterocarpoides: dorsomedian crest on third and fourth abdominal segments ending in a spine (no posterior spines in H. woodmasoni); in Heterocarpoides such a spine is also present on the fifth segment.

Species belonging to the other genera of Pandalidae: no crests on sides of carapace.

### SIZE:

Maximum total length: males, 13.1 cm females, 14.9 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within Fishing Area 51, so far known only from east Africa (Mozambique, Tanzania, Kenya, Somalia), Madagascar and the south-west coast of India. Also occurring in the Andaman Sea and several localities off the Indonesian Archipelago.

Found at depths of 220 to 640 m on soft sand and mud, most abundant between 300 to 400 m depth.

### PRESENT FISHING GROUNDS:

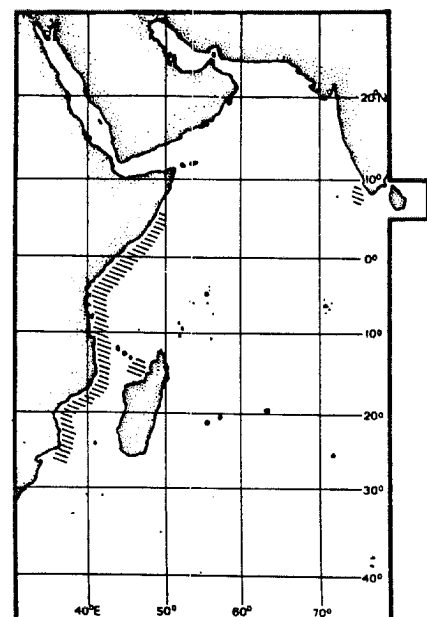
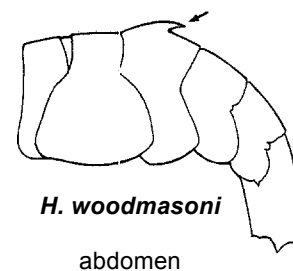
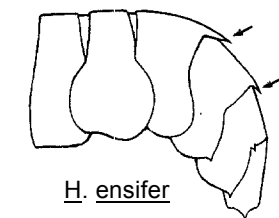
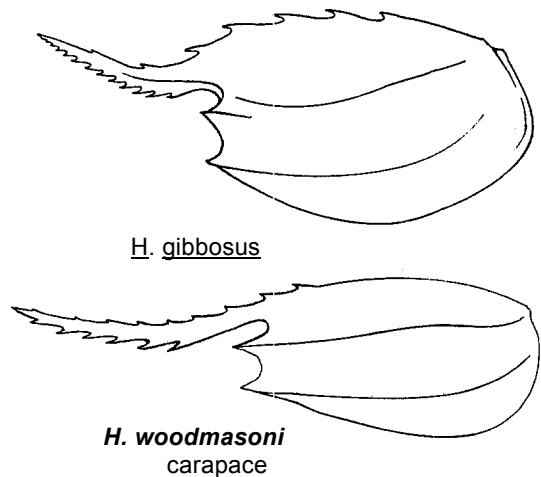
Commercially fished in small quantities in Kenya (off Malindi to Ras Ngomeni); this is the most abundant species in deep water catches off Kenya and south-west India.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION :

Separate statistics are not reported for this species.

Caught with bottom otter trawls.

Marketed frozen.



## FAO SPECIES IDENTIFICATION SHEETS

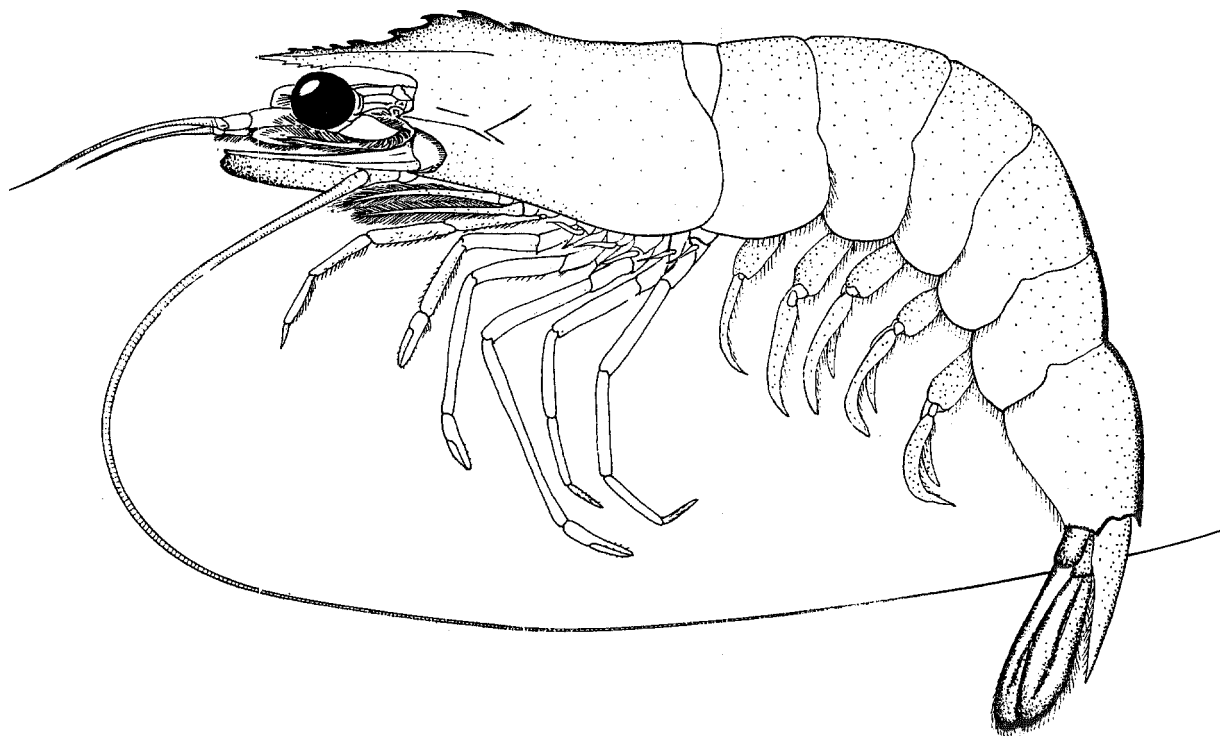
FISHING AREA 51  
(W. Indian Ocean)

## PENAEIDAE

## Penaeid shrimps

Shrimps with a well developed and toothed rostrum which generally extends to or beyond distal edge of eye; no styliform projection on base of eyestalk and no tubercle on its mesial (inner) border. Carapace without postorbital spine and with short cervical groove ending well below dorsal midline (extending at most for 2/3 of distance between hepatic spine and middorsal line). Last 2 pairs of pereopods well developed; third and fourth pairs of pleopods biramous; endopods of second air of leopods in males bearing appendix masculina only (lacking appendix interna and lateral, projection). Telson sharply pointed, with or without fixed or movable spines on sides. One single well developed arthrobranch on penultimate thoracic segment (hidden beneath the carapace), 1 rudimentary arthrobranch occasionally present.

This family, the largest of the Penaeidea, includes the most valuable marine commercial species of shrimps occurring in Fishing Area 51.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

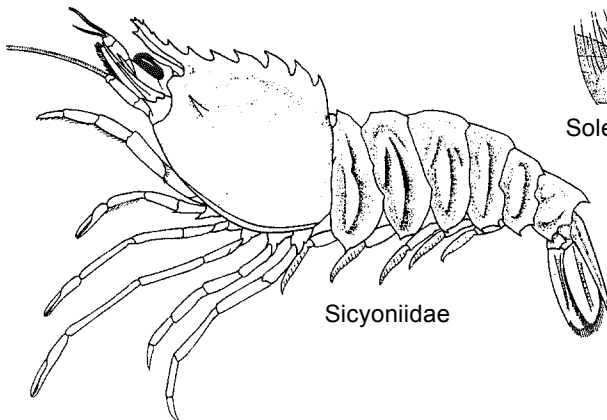
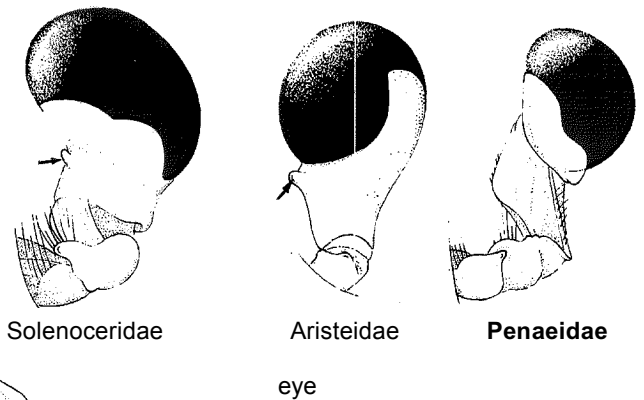
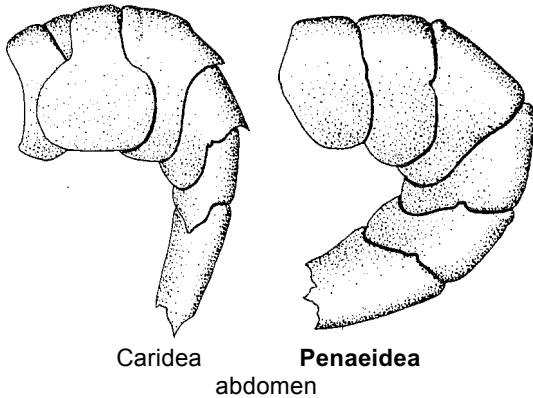
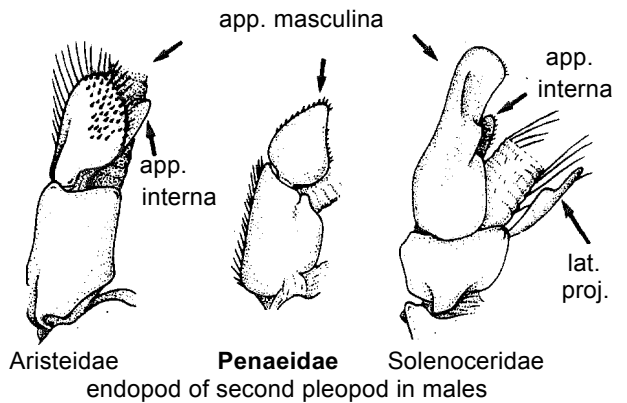
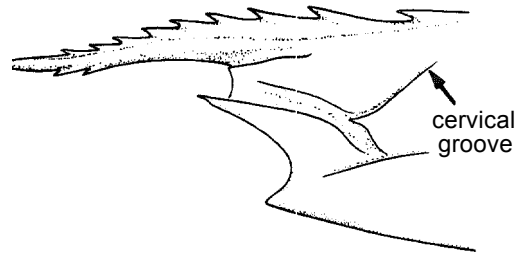
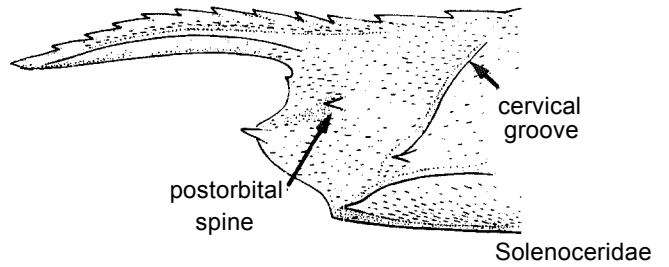
**Solenoceridae:** eyestalk with a tubercle on its mesial (inner) border; carapace with postorbital spine; cervical groove long, extending to, or close to, dorsal midline of carapace; endopods of second pair of pleopods in males bearing appendix masculina, appendix interna and lateral projection; telson with a fixed spine on each side of tip; 2 well developed arthrobranches on each side of penultimate thoracic segment.

**Aristeidae:** eyestalk with a tubercle on mesial (inner) border; upper antennular flagella strikingly shorter than lowers and inserted near posterior border of third article in species of interest to fisheries; endopods of second pair of pleopods in males bearing appendix masculina and appendix interna, but no lateral projection; 2 well developed arthrobranches on each side of penultimate thoracic segment.

**Sicyoniidae:** body thick, stony in appearance; cervical groove very faint or absent; abdomen with deep grooves and numerous tubercles; third and fourth pairs of pleopods single-branched.

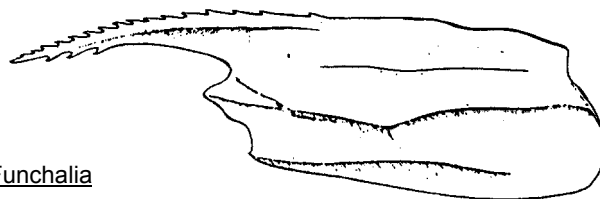
**Sergestidae:** small-sized shrimps; rostrum very short; last 2 pairs of pereopods shorter than anterior legs (fifth pair much shorter) or absent.

Shrimps belonging to the Infraorder Caridea: pleura of second abdominal segment overlapping those of first and third segments; no pincers on third pair of pereopods.

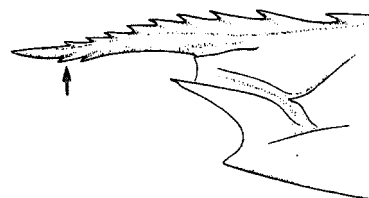


**KEY TO GENERA OCCURRING IN THE AREA:**

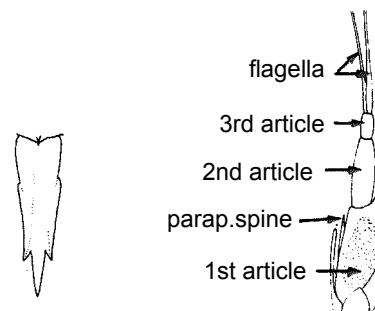
- 1a. Carapace with lateral keels (Fig.1); cutting portion of mandible elongate, sickle-shaped; pelagic shrimps ..... Funchalia
- 1b. Carapace without lateral keels; cutting portion of mandible short and massive
- 2a. Rostrum toothed on dorsal, as well as on ventral margin (Fig. 2) ..... Penaeus
- 2b. Rostrum toothed on dorsal margin only
- 3a. Telson tridentate, with a fixed spine on each side of Up (Fig.3)
- 4a. Rostrum shorter than the eyes; no spine on inner border of first article of antennular peduncle ..... Trachypenaeopsis
- 4b. Rostrum longer than the eyes; inner border of first article of antennular peduncle bearing a spine (parapenaeid spine) (Fig. 4)
- 5a. Carapace with longitudinal and transverse sutures (Fig. 5) ..... Parapenaeus
- 5b. Carapace without longitudinal or transverse sutures
- 6a. Males with symmetrical petasma (Fig. 6); a single arthrobranch on last thoracic segment, no trace of a second arthrobranch ..... Penaeopsis
- 6b. Males with asymmetrical petasma (Fig.7); 2 arthrobranches present on last thoracic segment, one of them well developed, the other vestigial ..... Metapenaeopsis



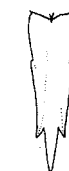
Funchalia Fig.1



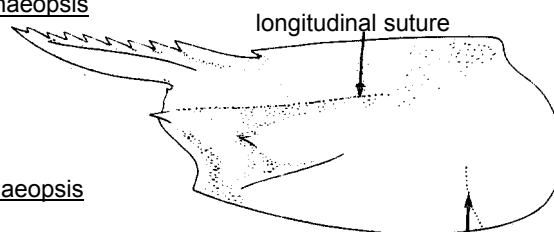
Penaeus Fig.2



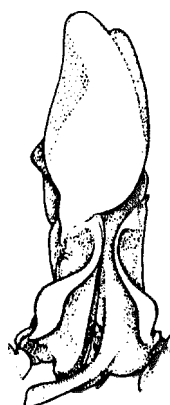
antennule Fig.4



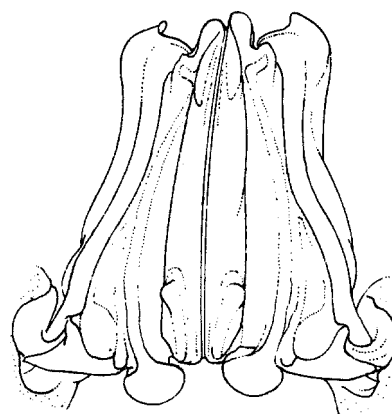
telson Fig.3



Parapenaeus Fig.5



asymmetrical petasma, ventral view Metapenaeopsis Fig.7



symmetrical petasma, dorsal view Penaeopsis Fig.6

- 3b. Telson usually without fixed spines; no spine on inner border of first article of antennular peduncle
  - 7a. Exopods absent on second to fifth pereopods; occurring only along the South African coast ..... Macropetasma
  - 7b. Exopods present on second to fourth pereopods
    - 8a. No exopod on fifth pereopod; pleurobranch present on penultimate thoracic segment ..... Metapenaeus
    - 8b. Exopod present on fifth pereopod; no pleurobranch on penultimate, thoracic segment
      - 9a. Carapace without longitudinal suture
        - 10a. Telson unarmed; basal spines present on second and third pereopods ..... Atypopenaeus
        - 10b. Telson armed with lateral spines; basal spine present only on first pereopod ..... Trachypenaeopsis
      - 9b. Carapace with longitudinal suture
        - 11a. Longitudinal suture short; epipod present on third pereopod ..... Trachypenaeus
        - 11b. Longitudinal suture usually long; epipod absent on third pereopod ..... Parapenaeopsis

**LIST OF SPECIES OF ECONOMIC INTEREST OCCURRING IN THE AREA:**

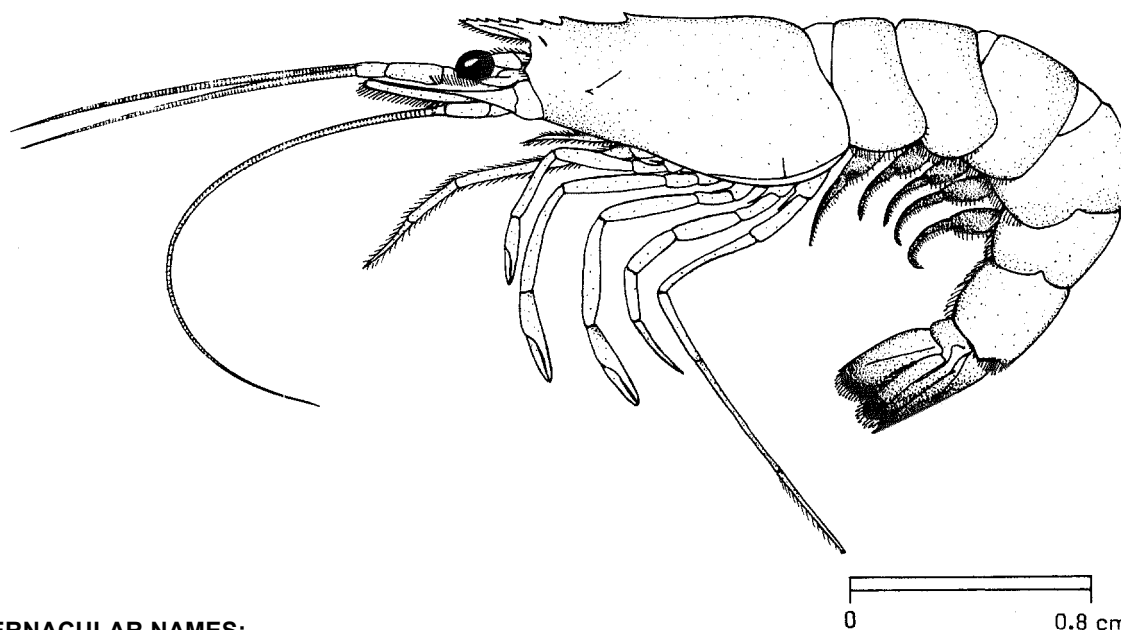
Code numbers are given for those species for which Identification Sheets are included.

<u>Atypopenaeus stenodactylus</u> (Stimpson, 186U)	PEN Aty 2
<u>Metapenaeopsis stridulans</u> (Alcock, 1905)	PEN Meta 16
<u>Metapenaeopsis toloensis</u> Hall, 1962	PEN Meta 17
<u>Metapenaeus affinis</u> (H. Milne Edwards, 1837)	PEN Metap 1
<u>Metapenaeus brevicornis</u> (H. Milne Edwards, 1837)	PEN Metap 4
<u>Metapenaeus dobsoni</u> (Miers, 1878)	PEN Metap 8
<u>Metapenaeus elegans</u> De Man, 1907	PEN Metap 10
<u>Metapenaeus ensis</u> (De Haan, 1844)	PEN Metap 12
<u>Metapenaeus lysianassa</u> (De Man, 1888)	PEN Metap 17
<u>Metapenaeus monoceros</u> (Fabricius, 1798)	PEN Metap 19
<u>Metapenaeus moyebi</u> (Rishinouye, 1896)	PEN Metap 20
<u>Metapenaeus stebbingi</u> Nobili, 1904	PEN Metap 22
<u>Parapenaeopsis acclivirostris</u> Alcock, 1905	PEN Para 1
<u>Parapenaeopsis cornuta</u> (Kishinouye, 1900)	PEN Para 4
<u>Parapenaeopsis coromandelica</u> Alcock, 1906	PEN Para 5
<u>Parapenaeopsis hardwickii</u> (Miers, 1878)	PEN Para 6
<u>Parapenaeopsis maxillipedo</u> Alcock, 1905	PEN Para 8
<u>Parapenaeopsis sculptilis</u> (Heller, 1862):	PEN Para 11
<u>Parapenaeopsis stylifera</u> (H. Milne Edwards, 1837)	PEN Para 12
<u>Parapenaeopsis uncta</u> Alcock, 1905	PEN Para 14
<u>Parapenaeus longipes</u> Alcock, 1905	PEN Parap 6
<u>Penaeopsis balssi</u> Ivanov and Hassan, 1976	PEN Pe 3
<u>Penaeopsis jerryi</u> Perez Farfante, 1979	PEN Pe 4

<u>Penaeus</u> ( <u>Fenneropenaeus</u> ) <u>indicus</u> H. Milne Edwards, 1837	PEN Pen 13
<u>Penaeus</u> ( <u>Fenneropenaeus</u> ) <u>merquiensis</u> De Man, 1888	PEN Pen 14
<u>Penaeus</u> ( <u>Fenneropenaeus</u> ) <u>penicillatus</u> Alcock, 1905	PEN Pen 15
<u>Penaeus</u> ( <u>Marsupenaeus</u> ) <u>japonicus</u> Bate, 1888	PEN Pen 19
<u>Penaeus</u> ( <u>Melicertus</u> ) <u>canaliculatus</u> (Olivier, 1811)	PEN Pen 20
<u>Penaeus</u> ( <u>Melicertus</u> ) <u>latisulcatus</u> Kishinouye, 1896	PEN Pen 21
<u>Penaeus</u> ( <u>Penaeus</u> ) <u>monodon</u> Fabricius, 1798	PEN Pen 26
<u>Penaeus</u> ( <u>Penaeus</u> ) <u>semisulcatus</u> De Haan, 1844	PEN Pen 27
<u>Trachypenaeus</u> <u>curvirostris</u> (Stimpson, 1860)	PEN Trachyp 5
<u>Trachypenaeus</u> <u>granulosus</u> (Haswell, 1879)	PEN Trachyp 10
<u>Trachypenaeus</u> <u>sedili</u> Hall, 1961	PEN Trachyp 12

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Atypopenaeus stenodactylus* (Stimpson, 1860)OTHER SCIENTIFIC NAMES STILL IN USE: *Atypopenaeus compressipes* (Henderson, 1893)

## VERNACULAR NAMES:

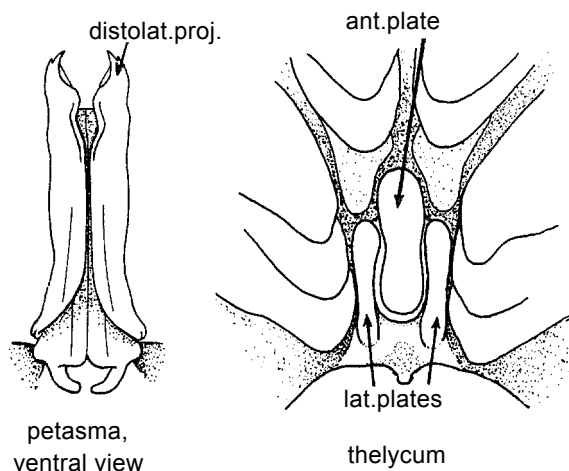
FAO :           En - Periscope shrimp  
                  Fr - Crevette périscope  
                  Sp - Camarón periscopio

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace very slightly pubescent. Rostrum short and straight, not exceeding distal margin of first antennular segment and armed with 6 to 9 (usually 9) dorsal teeth; postrostral crest ending near posterior margin of carapace; postorbital groove deep; hepatic spine present; middorsal crest on fourth and fifth abdominal segments distinct, but not ending in a posterior spine on each segment; antennular flagella longer than carapace; propodus and dactyl of fifth pereopod very long and slender. Petasma (in males) with distolateral projections directed forward, narrowing from base to tip, with inner surface deeply concave and with an indentation at tip. In females, anterior plate of thelycum tongue-like, with rounded anterior and posterior ends; lateral plates bar-shaped enclosing posterior half of anterior plate and delimitating with posterior sternal plate a seminal receptacle.

Colour: pink to reddish pink.





### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

This is the only species of the genus so far known to occur in the area; all other species of *Atypopenaeus* possess at least one of the following differing characters: rostrum long and slender, presence of strong spines at posterior end of middorsal crest on fourth and fifth abdominal segments, absence of hepatic spine.

### **SIZE:**

Maximum total length: males, 4 cm; females, 5 cm.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, India, as far north as the Gulf of Cambay and northern Sri Lanka. Further east it extends to China, Japan and the Philippines.

A marine species inhabiting close to the shore from 10 to 30 m depth on muddy bottom.

### **PRESENT FISHING GROUNDS:**

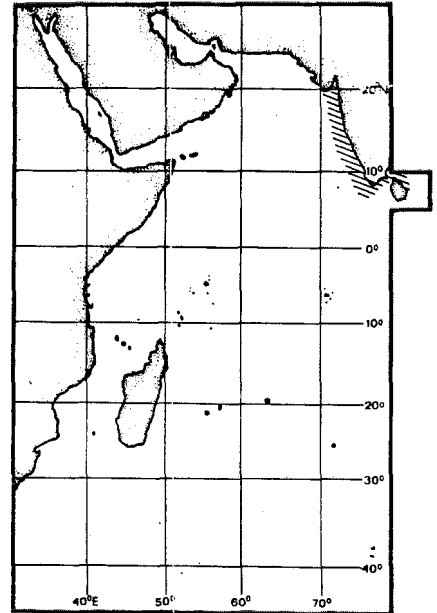
Caught in large numbers throughout the year near Bombay, on the west coast of India; also abundant along the northeast coast of Sri Lanka.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught mainly with bag nets and other artisanal gear.

Marketed fresh, dried or cooked.

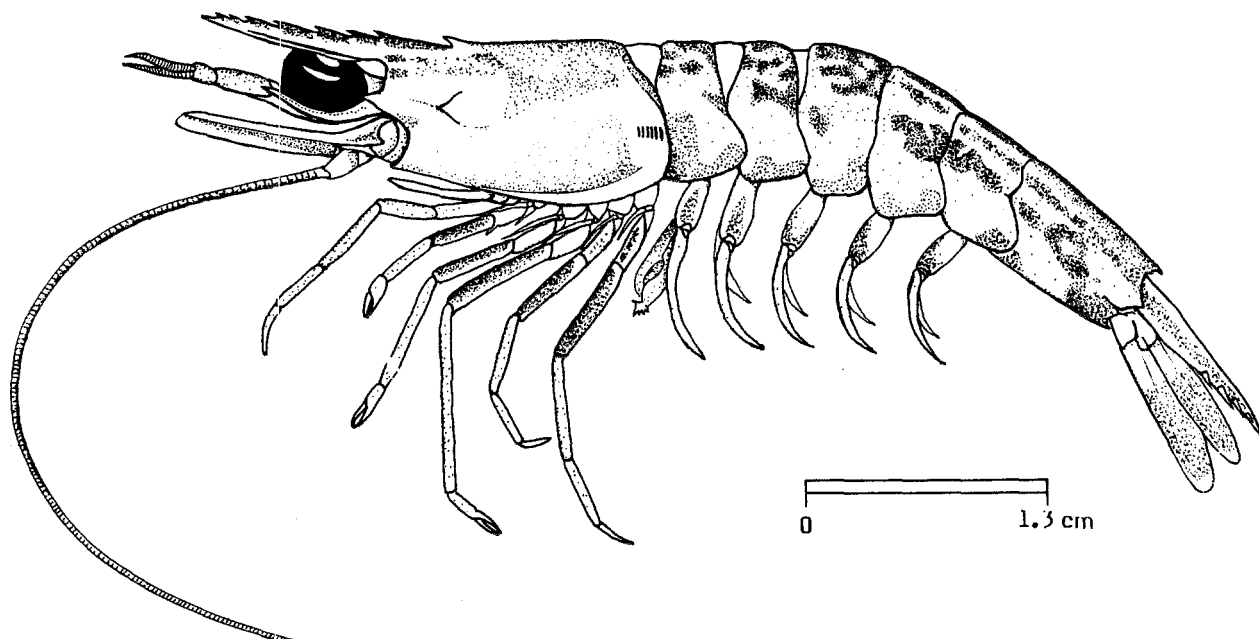


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Metapenaeopsis stridulans* (Alcock, 1905)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

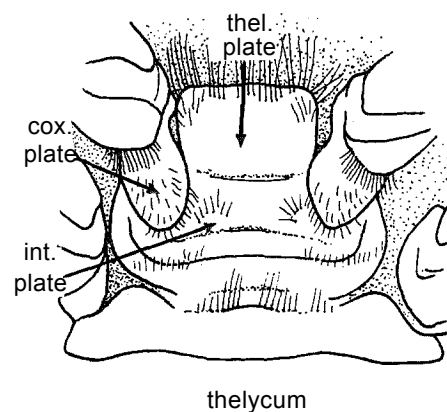
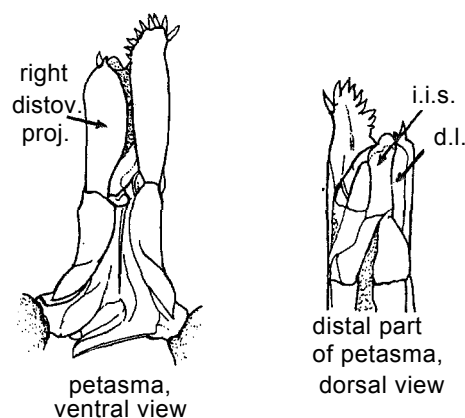
FAO: En - Fiddler shrimp  
Fr - Crevette violoneuse  
Sp - Camarón violinista

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body densely pubescent. Rostrum low, usually straight, directed forward or slightly upward, reaching to, or almost to, tip of antennular peduncle and armed with 7 or 8 dorsal teeth, the penultimate tooth generally anterior to orbital margin of carapace; stridulating organ (on posterior part of carapace) consisting of 5 to 7 very strong ridges in a wide, straight band at 4/10 of carapace depth; middorsal crest on third abdominal segment with a usually broad groove. Petasma (in males) asymmetrical, right distoventral projection shorter and bearing a few small apical processes, left distoventral projection with 5 to 12 larger apical processes; in dorsal view: inner intermediate strip (i.i.s.) broadly quadrangular, disto-median lobule (d.l.) slightly shorter, but much broader distally than i.i.s. In females, thelycal plate subquadrate with rounded corners and slightly wider than long; intermediate plate broadly trapezoidal, much wider than long, flat or with a shallow median groove; coxal plates of fourth pereopods smaller than thelycal plate.

Colour: white to reddish-brown, with red to dark brown mottlings; pereopods pinkish to dark red except on their proximal parts; uropods red to brown except for their proximal third and often their tips.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Metapenaeopsis barbata and M. toloensis: stridulating organ consisting of more than 12 small ridges disposed in a curved band and situated at about 1/4 depth of carapace (5 to 7 very strong ridges on a straight band and situated at 4/10 of carapace in M. stridulans).

Other species of Metapenaeopsis entering catches: stridulating organ absent.

### SIZE:

Maximum total length: males, 7.2 cm; females, 10.5 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, the "Gulf" and the Gulf of Oman to south India and Sri Lanka. Further east it extends as far as the Gulf of Thailand, China and Indonesia.

A marine species found from 9 to 90 m depth on sandy or muddy bottom.

### PRESENT FISHING GROUNDS:

In the "Gulf" and the northern Arabian Sea it is caught rather frequently but the fishery for this species is of minor or no importance; near Bombay it is caught in fairly large numbers; also fished in Sri Lanka where it is apparently the most abundant penaeid on the mud banks of the northeast coast.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with shrimp trawls, gill nets, seines and other artisanal gear.

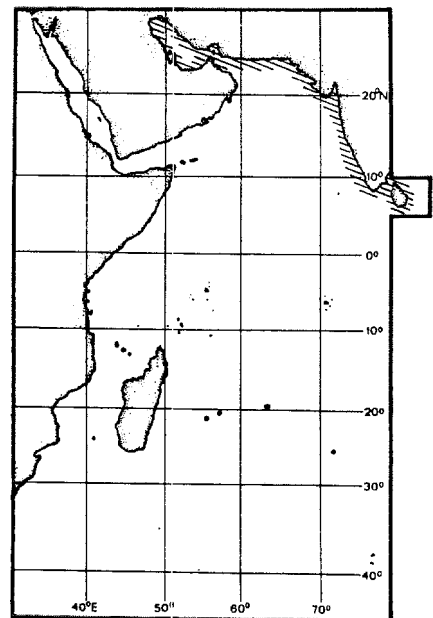
Marketed fresh, dried or cooked.



M. toloensis

***M. stridulans***

stridulating organ

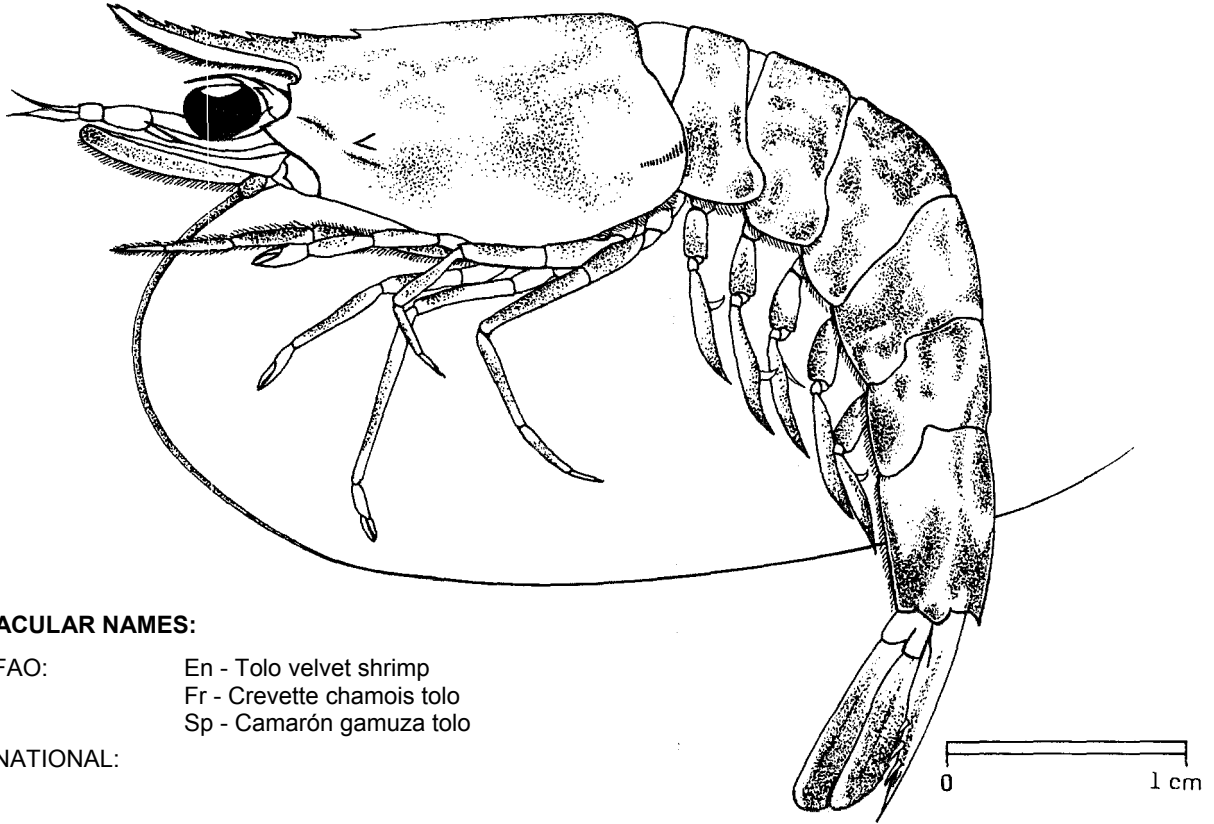


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Metapenaeopsis toloensis* Hall, 1962

OTHER SCIENTIFIC NAMES STILL IN USE : None



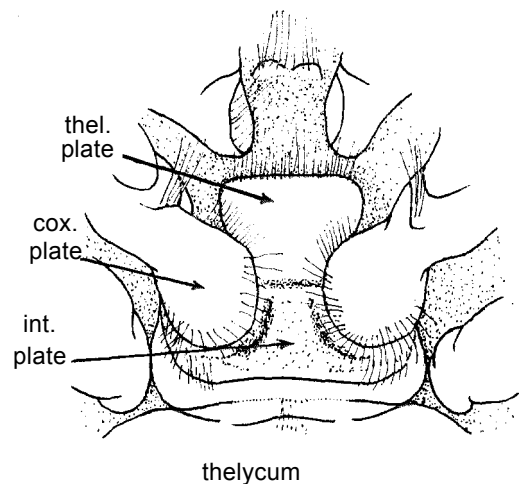
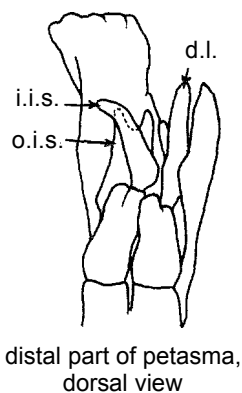
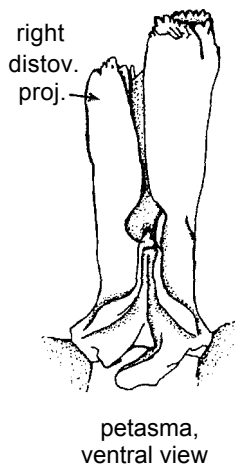
## VERNACULAR NAMES:

FAO: En - Tolo velvet shrimp  
Fr - Crevette chamois tolo  
Sp - Camarón gamuza tolo

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body densely pubescent. Rostrum upcurved or straight (if so, tip upcurved), reaching end of second antennular segment or little beyond and armed with 8 or 9 dorsal teeth, penultimate tooth in level with orbital margin of carapace; stridulating organ (on posterior part of carapace) consisting of 14 to 22 small ridges in a curved band at 1/4 of depth of carapace; middorsal crest on third abdominal segment with a generally deep groove. Petasma (in males) asymmetrical, right distoventral projection shorter and bearing a few small apical processes, left distoventral projection broadly swollen and with distomedian and distolateral processes; in dorsal view: inner intermediate strip (i.i.s.) flat and slender, outer intermediate strip (o.i.s.) slightly shorter than i.i.s. and bifurcate distally, distomedian lobule (d.l.) longer than i.i.s. and slim. In females, thelycal plate subquadrate with rounded



corners and about as long as wide; intermediate plate trapezoidal, as long as wide, sunken, and with strongly elevated and densely setose lateral sides; coxal plates of fourth pereopods about as large as thelycal plate.

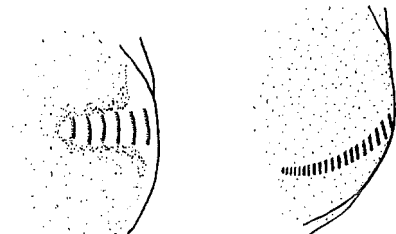
Colour: yellowish-brownish with irregular dark red to dark brown mottlings; pereopods pinkish to red-brown; uropods dark red to brown except for their proximal parts.

#### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Metapenaeopsis stridulans: stridulating organ consisting of 5 to 7 very strong ridges in a wide and straight band (14 to 22 small ridges in a narrow and curved band in M. toloensis); different configuration of petasma and thelycum.

M. barbata: within the area, reported only from southeast India; penultimate rostral tooth anterior to orbital margin of carapace (at same level in M. toloensis); middorsal crest on third abdominal segment broad, flat or slightly grooved (deeply grooved in M. toloensis); different configuration of petasma and thelycum.

Other species of Metapenaeopsis entering catches: stridulating organ absent.



M. stridulans      M. toloensis  
stridulating organ

#### SIZE:

Maximum total length: males, 8 cm; females, 9.2 cm.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, only known from the northeast coast of Sri Lanka. Also present from the Andaman Sea to the Gulf of Thailand, the Philippines and south China (Gulf of Tonkin).

A marine species found from 20 to 70 m depth mainly on sandy or muddy bottom.

#### PRESENT FISHING GROUNDS:

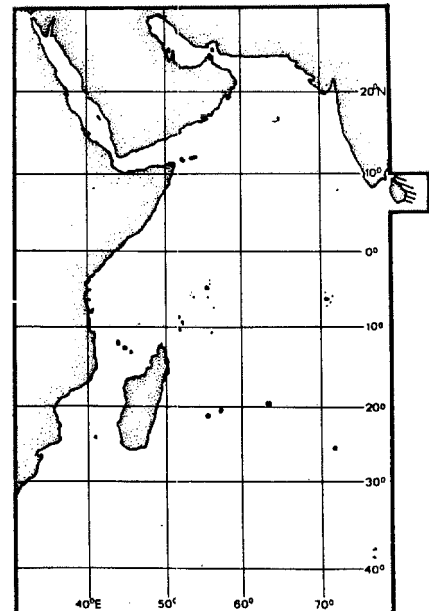
Abundant in shrimp catches along the east coast of Sri Lanka.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with otter trawls and artisanal gear.

Marketed fresh, dried or peeled and cooked.

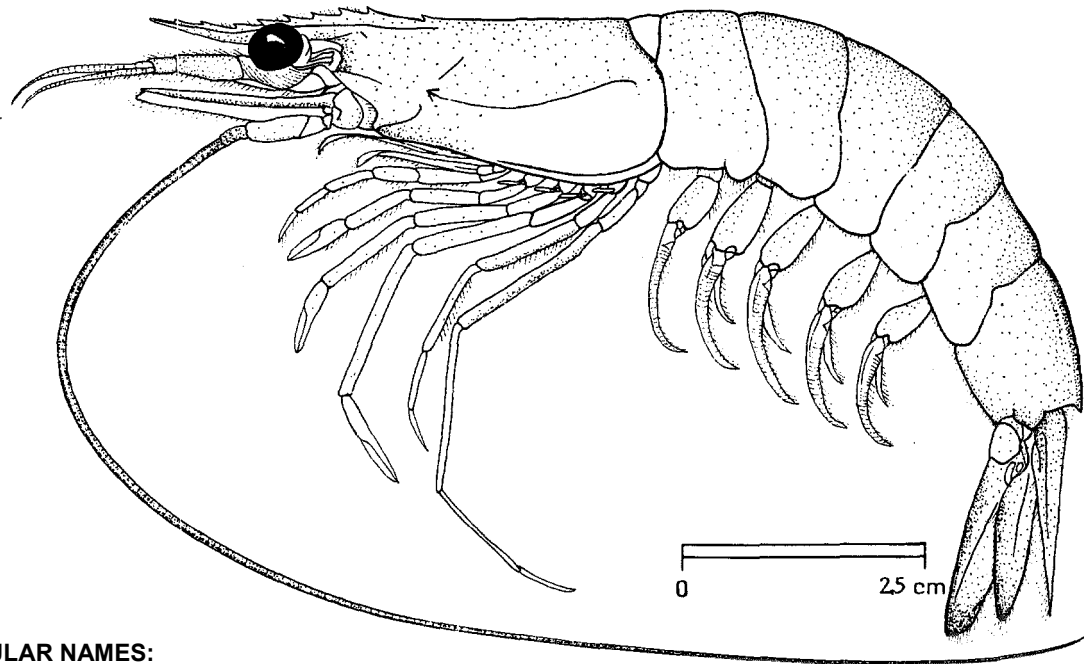


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

*Metapenaeus affinis* (H. Milne Edwards, 1837)FISHING AREA 51  
(W. Indian Ocean)

## OTHER SCIENTIFIC NAMES STILL IN USE:

*Metapenaeus mutatus* (Lanchester, 1901)*Metapenaeus alcocki* George and Rao, 1968

## VERNACULAR NAMES:

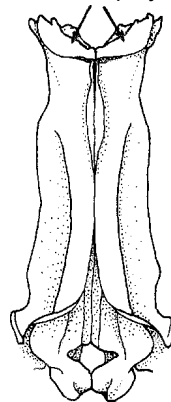
FAO : En - Jinga shrimp  
Fr - Crevette jinga  
Sp - Camarón jinga

NATIONAL

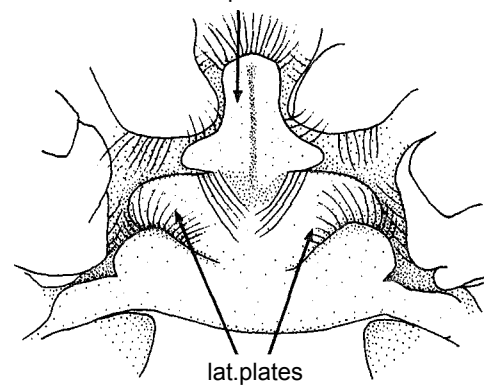
## DISTINCTIVE CHARACTERS:

Generally almost entire body pubescent, rarely partly or completely hairless; rostrum armed with 8 to 11 teeth along entire dorsal margin, slightly sinuous and reaching from proximal to distal margin of third antennular article, or exceeding it; postrostral ridge ending near posterior margin of carapace; adrostral crest ending behind second rostral tooth, and adrostral groove a little behind epigastric tooth; branchiocardiac ridge slightly sinuous and reaching posterior extension of hepatic spine; telson armed only with spinules; ischial spine on first pereopod present or absent. In adult males, merus of fifth pereopod with a proximal notch, followed by a twisted, keeled tubercle; distomedian projections of petasma crescent-shaped, leaning on distolateral projections and concealing them partly or completely; distolateral projections directed anterolaterally. In females, anterior plate of thelycum deeply grooved longitudinally and considerably wider posteriorly; posterior transverse ridge with 2 anterolateral rounded projections partly covering lateral plates; impregnated (fertilized) specimens occasionally with white conjoined pads on thelycum.

distomed.proj.

petasma  
ventral view

ant.plate

lat.plates  
thelycum

Colour: body pale greenish to pale pinkish, sometimes green-bluish or pink-brownish, with green or red-brown specks; middorsal abdominal crest brown or brownish-red; antennae red; pereopods white or of same colour as body; pleopods reddish to whitish; distal half of uropods translucent green or rust coloured, tips usually whitish to yellowish.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Metapenaeus kutchensis (restricted to the Gulf of Kutch, India; slight differences in the configuration of petasma and thelycum.

M. elegans: different configuration of petasma and thelycum; pubescence generally confined to some patches (generally almost entire body pubescent in M. affinis).

M. monoceros and M. ensis: merus of fifth pereopod in males with a long, inwardly curved, spiniform process (with a tubercle in M. affinis); different configuration of petasma and thelycum; distal part of uropods purple-blue (tips pale in M. affinis).

Other species of Metapenaeus: different configuration of petasma and thelycum. Furthermore, these species differ from M. affinis by at least one of the following characters: rostrum very short; rostrum toothless on distal third to half; branchio-cardiac ridge absent, or distinct only on posterior third of carapace (reaching posterior extension of hepatic spine in M. affinis).

### SIZE:

Maximum total length: males, 14.6 cm; females, 18.6 (22.2) cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs in the "Gulf" and the Arabian Sea from the Gulf of Oman to south India; it is also present in Sri Lanka. Further east it extends as far as the Philippines and Taiwan Island.

Found from the coastline to depths of about 55 m (occasionally in deeper water to 90 m), mainly on mud or sandy-mud; juveniles inhabit estuaries and backwaters, but the postlarval migration from the sea to backwaters and estuaries is not as extensive as for other species like M. dobsoni or P. indicus; adults can form large shoals, along with other species, in mud bank areas.

### PRESENT FISHING GROUNDS:

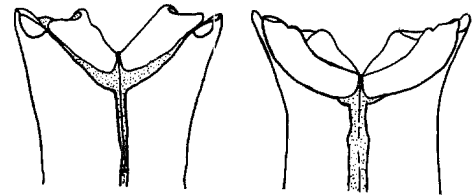
In the "Gulf" (off Kuwait and Bahrain) it is one of the most important species in the artisanal fisheries; important catches are also taken in Pakistan and Sri Lanka; along the Indian coast it is the most important commercial species of Metapenaeus, particularly near Bombay.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

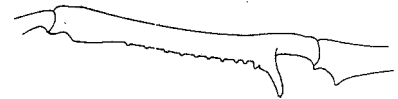
Separate statistics are not reported for this species by FAO.

Offshore, it is caught mainly by shrimp trawls; in inshore and nearshore waters, several other types of gear are also used: set gill nets, drift nets, boat seines, beach seines, beam trawls, stake nets, dol nets and other trap nets, cast nets, scoop nets and push nets (the last 3 for juveniles).

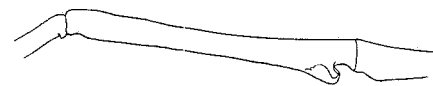
Marketed mostly fresh and frozen; also canned, peeled and cooked, sundried or as paste or shrimp meal.



M. kutchensis      **M. affinis**  
distal part of petasma

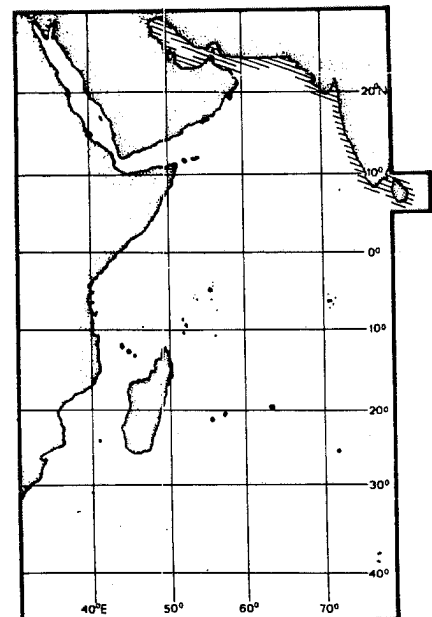


M. monoceros



**M. affinis**

merus of fifth pereopod (male)



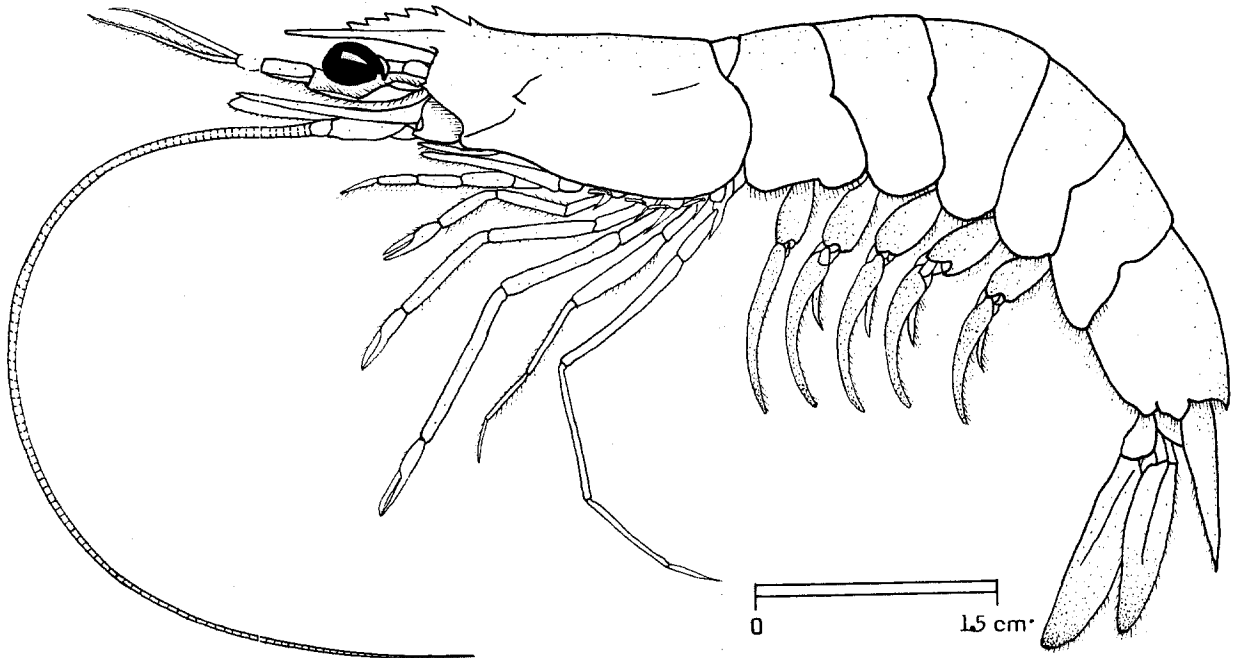
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Metapenaeus brevicornis* (H. Milne Edwards, 1837)

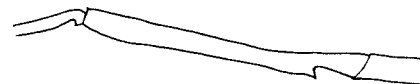
OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

FAO : En - Yellow shrimp  
Fr - Crevette jaune  
Sp - Camarón amarillo

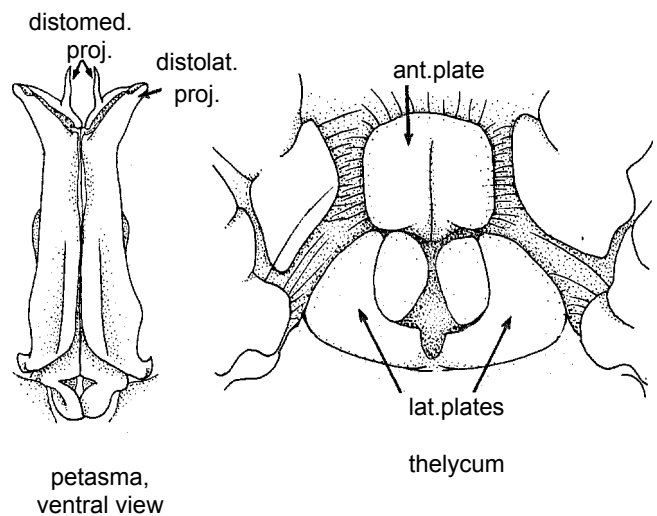
NATIONAL:



merus of fifth pereopod (male)

DISTINCTIVE CHARACTERS:

Almost entire body hairless; rostrum armed with 5 to 7 dorsal teeth, toothless on little less than its distal half, reaching from proximal margin of second, to distal margin of third antennular article, rostral crest high; postrostral ridge not reaching posterior margin of carapace; adrostral crest and groove reaching as far as second rostral tooth; branchiocardiac ridge feeble, not reaching middle of carapace; telson armed only with spinules, 1 or 2 distal pairs larger; a small ischial spine on first pereopod. In adult males, merus of fifth pereopod with a proximal notch, followed by a keel-shaped tubercle; each distomedian projection of petasma with a long and slender apical filament; distolateral projections directed anterolaterally. In females, anterior plate of thelycum large square and grooved; lateral plates boomerang shaped (often continuous to posterior sternite) and enclosing 2 pear-shaped plates; impregnated (fertilized) specimens with white conjoined pads on thelycum.



petasma,  
ventral view



Colour: body yellow to white, sometimes greyish, with distinct dark green to bluish-brown specks; pereopods of same colour; pleopods yellowish to pinkish; distal part of uropods brown to rusty red, sometimes only the tips are coloured.

#### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

All other *Metapenaeus* species occurring in the area can be distinguished from *M. brevicornis* by the configuration of petasma and thelycum. Further distinguishing characters of these species are:

*M. lysianassa*: rostrum very short, ending by middle of first antennular article and toothed along entire dorsal margin (reaching at least to second article and toothless on distal half in *M. brevicornis*); adrostral crest and groove ending below third rostral tooth (ending below second rostral tooth in *M. brevicornis*)

*M. dobsoni*: rostrum also toothless on distal half, but rostral crest low (high in *M. brevicornis*) and rostral teeth at least 7 (5 to 7 in *M. brevicornis*); adrostral groove ending behind epigastric tooth.

Remaining species of *Metapenaeus*: rostrum armed along entire dorsal margin, with a low crest and more than 7 teeth; adrostral groove ending behind epigastric tooth.

#### **SIZE:**

Maximum total length: males, 9.8 cm; females, 13.2 cm.

#### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

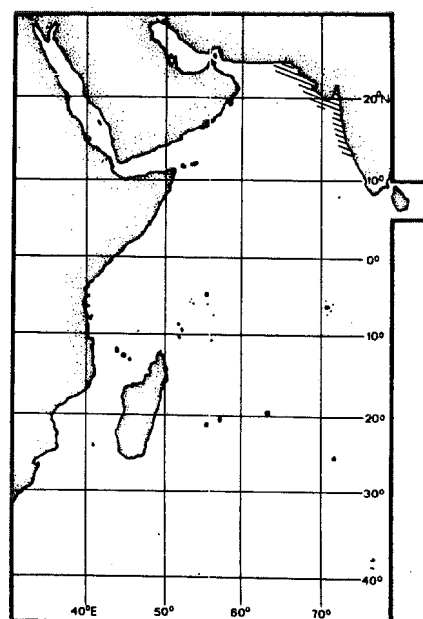
Within the area, it occurs along the coasts of Pakistan and India, as far south as Mangalore. Further east, it extends to Viet Nam and Indonesia.

A marine to almost freshwater species, found on sand or mud in depths usually not exceeding 30 to 40 m (occasionally fished in deeper water, down to 90 m). Juveniles inhabit estuaries, backwaters and deltas.

#### **PRESENT FISHING GROUNDS:**

In eastern Pakistan and on the north-west coast of India, the species is common and is considered to be of moderate to great commercial importance.

The species is cultivated in India and several other countries outside the area.



#### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with a variety of set gear (dol nets, stake nets, trap nets, etc.), cast nets, dip nets, push nets, scoop nets and drag nets (the last 3 used mostly for juveniles), it is also fished with gill nets and drift nets, boat seines, beach seines and otter trawls.

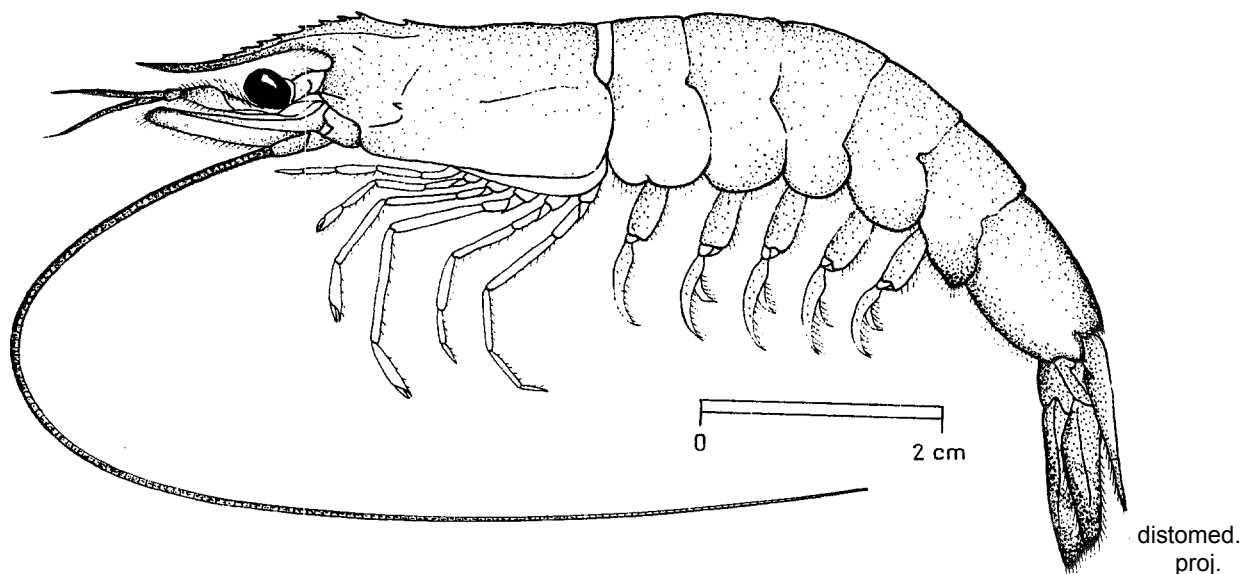
Marketed fresh, frozen, canned or peeled and cooked; also sold as paste or shrimp meal.

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

*Metapenaeus dobsoni* (Miers, 1878)FISHING AREA 51  
(W. Indian Ocean)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

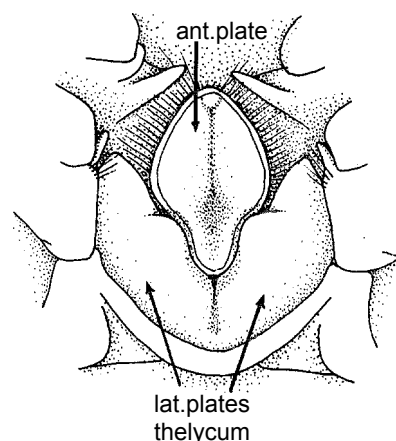
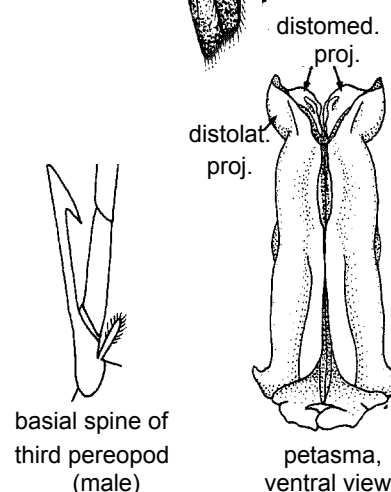
FAO :       En - Kadal shrimp  
              Fr - Crevette kadal  
              Sp - Camarón kadal

NATIONAL

## DISTINCTIVE CHARACTERS:

Usually almost entire body pubescent, but pubescence can be restricted to a few patches; rostrum long, extending beyond antennular peduncle, slightly sinuous, armed with 7 to 9 dorsal teeth, but toothless on its distal half; postrostral ridge ending near posterior margin of carapace; adrostral crest reaching as far as epigastric tooth, adrostral groove a little beyond; branchiocardiac groove almost reaching to middle of carapace; telson armed only with spinules; no ischial spine on first pereopod. In adult males, basial spine of third pereopod extremely long and barbed, and merus of fifth pereopod with 1 or 2 large, triangular teeth; each distomedian projection of petasma with a short filament on ventral surface and another on dorsal surface; distolateral projections directed forward. In females, fifth pereopod often reduced to coxa and basis; thelycum with a long, grooved tongue-like anterior plate partially ensheathed in a horse-shoe-like process formed by the lateral plates; impregnated (fertilized) specimens with white conjoined pads on thelycum.

Colour: body pale yellow to brownish with red, brownish or greenish specks; distal part of rostrum darker; antennae red; middorsal abdominal crest and margin of last segment dark brown to red; pereopods and pleopods white to pinkish; uropods grey-brownish, darker distally with external part of exopods red.

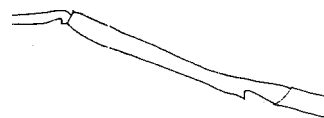


## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

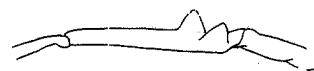
All other Metapenaeus species occurring in the area can be distinguished from M. dobsoni by the configuration of petasma and thelycum. Further distinguishing characters of these species are:

M. brevicornis: rostrum reaching at most to distal margin of antennular peduncle (extending beyond it in M. dobsoni); rostral crest high and adrostral crest and groove ending below second rostral tooth (adrostral groove extending beyond epigastric tooth in M. dobsoni); in males, merus of fifth pereopod only with a tubercle (with 1 or 2 large triangular teeth in M. dobsoni).

Remaining species of Metapenaeus: rostrum armed along entire dorsal margin (toothless on distal half in M. dobsoni); in males, basal spine of third pereopod simple (very long and barbed in M. dobsoni) and in females, fifth pereopod entire (often reduced to coxa and basis in M. dobsoni).



M. brevicornis



***M. dobsoni***  
merus of fifth pereopod (male)

## SIZE:

Maximum total length: males, 11.8 cm; females, 13 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

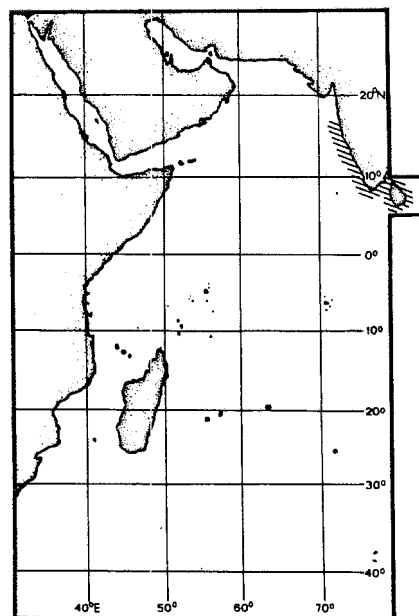
Within the area, it occurs along the Indian coast as far north as Maharashtra Province, and off Sri Lanka. Further east it extends to the Gulf of Thailand, Indonesia and the Philippines.

Juveniles inhabit estuaries, backwaters and paddy fields; adults are also found at sea on mud, down to 37 m depth; it tolerates salinities ranging from 3 to 43% ; abundant in low salinity lagoons and adjacent marine areas, but rather rare in high salinity lagoons; it breeds in 9 to 24 m depth and may form shoals along with other species of shrimp.

## PRESENT FISHING GROUNDS:

Southwest coast of India, where it is one of the major species contributing to inshore and backwater fisheries; the paddy field fishery of Kerala is mostly dependent on this species. In Sri Lanka it is the most abundant shrimp of the penaeid fauna.

It is cultivated in India.



## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species by FAO.

In the backwaters it is caught mainly with boat seines and shore seines; other gear used are: stake nets, lift nets, cast nets, scoop nets, drag nets and gill nets. At sea, it is mostly fished by shrimp trawls.

Marketed fresh and canned.

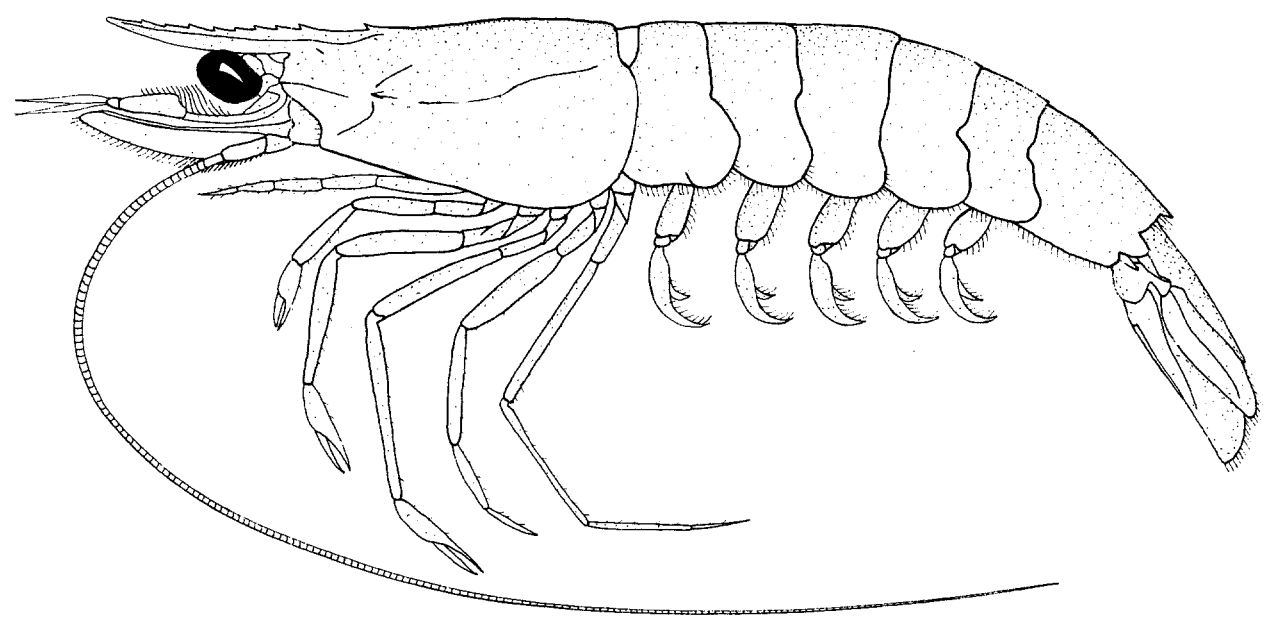
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

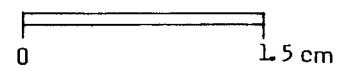
Metapenaeus elegans De Man, 1907

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

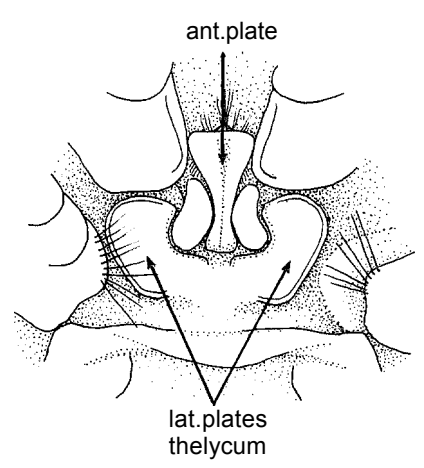
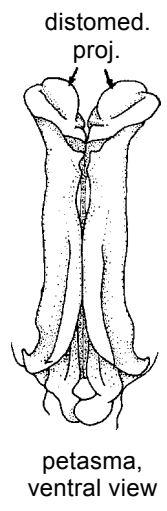
- FAO : En - Fine shrimp
- Fr - Crevette élégante
- Sp - Camarón fino



NATIONAL

DISTINCTIVE CHARACTERS:

Pubescence generally restricted to dorsal carapace and some patches on last abdominal segments, sometimes body hairless; rostrum armed with 9 to 12 teeth along entire dorsal margin, nearly straight, reaching from proximal to distal margin of third antennular article or exceeding it; postrostral crest not reaching posterior margin of carapace; adrostral crest ending well behind second rostral tooth, adrostral groove behind epigastric tooth; branchiocardiac ridge reaching at least to middle of carapace, but usually to posterior extension of hepatic spine; telson armed only with spinules; ischial spine on first pereopod generally small. In adult males, merus of fifth pereopod with a proximal notch, followed by a keeled tubercle; distomedian projections of petasma directed anterolaterally, leaf-like, with a distinct longitudinal groove. In females, anterior plate of thelycum tongue-like, wider anteriorly, and longitudinally grooved; lateral margins of lateral plates raised and curved inward posteriorly.



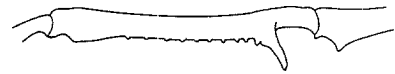
Colour: body, pereopods and pleopods pale green to pinkish, sometimes grey-greenish.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

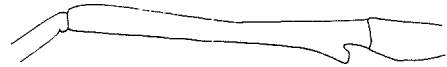
Metapenaeus monoceros and M. ensis: merus of fifth pereopod in males with a long inwardly curved spiniform process (only with a tubercle in M. elegans); different configuration of petasma and thelycum.

M. affinis: generally almost entire body pubescent; different configuration of petasma and thelycum.

Other species of Metapenaeus: different configuration of petasma and thelycum. Furthermore, these species differ from M. elegans by at least one of the following characters: rostrum very short; rostrum toothless on distal third to half; branchio-cardiac ridge absent, or distinct only on posterior third of carapace (reaching posterior extension of hepatic spine in M. elegans).



M. monoceros



***M. elegans***  
merus of fifth pereopod (mole)

## SIZE:

Maximum total length: males, 8.4 cm; females, 11.8 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it is only known from the west and south coasts of Sri Lanka. Also present along the Malay Peninsula, Indonesia, Borneo, the Philippines and New Guinea.

Usually found in estuaries, ponds and inland lagoons with low salinity; it is not common in the sea, but it has been fished on mud or sandy-mud down to 55 m depth; in Sri Lanka both sexes mature within the lagoons.

## PRESENT FISHING GROUNDS:

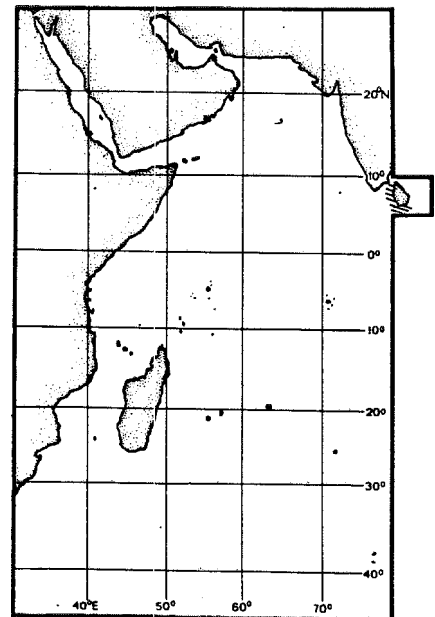
Southern coast of Sri Lanka where the species is apparently abundant.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mostly with traps. In other areas, trawls, push nets and set nets are also used.

Probably marketed fresh and dried.

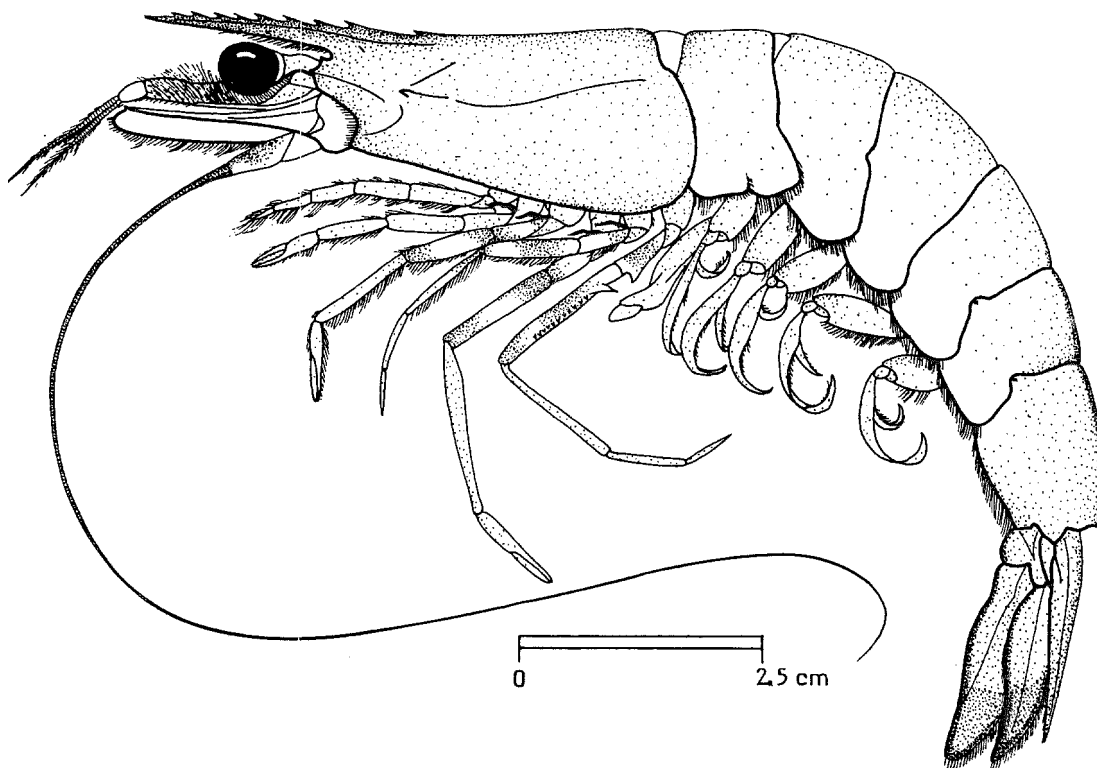
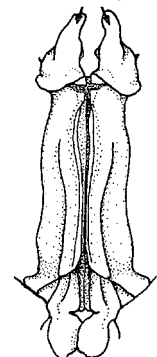


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Metapenaeus ensis* De Haan, 1844

OTHER SCIENTIFIC NAMES STILL IN USE : None

distomed.  
proj.petasma,  
ventral view

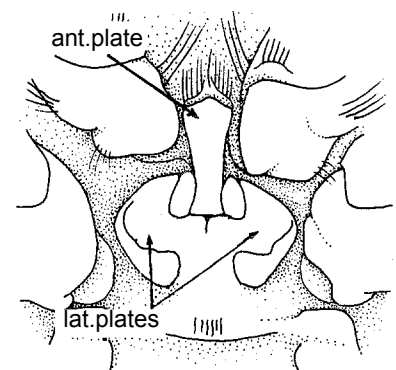
## VERNACULAR NAMES:

FAO : En - Greasyback shrimp  
Fr - Crevette glissante  
Sp - Camarón resbaloso

NATIONAL:

## DISTINCTIVE CHARACTERS:

Almost entire body pubescent, occasionally pubescence restricted to dorsal part of carapace and posterior abdominal segments (juveniles hairless); rostrum armed with 8 to 11 teeth along entire dorsal margin, nearly straight, and reaching to, or nearly to, tip of antennular peduncle; postrostral crest reaching to, or almost to posterior margin of carapace; adrostral crest ending behind second rostral tooth, adrostral groove behind epigastric tooth; branchiocardiac ridge usually sinuous, reaching posterior extension of hepatic spine; telson armed only with spinules; a small ischial spine on first pereopod. In adult males, merus of fifth pereopod with a proximal notch followed by a long, inwardly curved spiniform process and a row of tubercles; distomedian projections of petasma convoluted, greatly swollen and directed forward, triangular in shape and concealing almost entirely distolateral projections in ventral view. In females, anterior plate of thelycum lone and deeply grooved; lateral plates with strongly raised lateral margins forming posteriorly 2 inwardly curved triangular projections.



thelycum

Colour: body pink to greenish-grey; middorsal abdominal crest brown; antennae red; pereopods and pleopods of same colour as body or red, the former with white stripes on ischium and merus; distal part of uropods purple-blue, external margins of exopods red-brown.

#### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

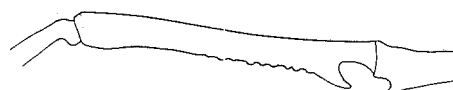
Metapenaeus monoceros: different configuration of petasma and thelycum.

M. kutchensis (restricted to Gulf of Kutch, India), M. affinis and M. elegans: different configuration of petasma and thelycum; in males, merus of fifth pereopod with a tubercle (with a long spiniform process in M. ensis); in M. affinis, tips of uropods pale (purple-blue in M. ensis)

Other species of Metapenaeus: different configuration of petasma and thelycum; distal part of uropods not purple-blue. Furthermore, these species differ from M. ensis by at least one of the following characters: rostrum very short; rostrum toothless on distal third to half; branchiocardiac ridge absent, or distinct only on posterior third of carapace (reaching posterior extension of hepatic spine in M. ensis).



M. elegans



**M. ensis**  
merus of fifth pereopod (male)

#### SIZE:

Maximum total length: males, 15.4 cm; females, 18.9 cm.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, reported only from the east coast of Sri Lanka. Further east it extends from Bangladesh to Japan, New Guinea and Australia.

Juveniles are found in estuaries, backwaters and near-shore areas; adults in deeper, and often turbid waters down to 70 m depth on mud, sandy-mud or silt.

#### PRESENT FISHING GROUNDS:

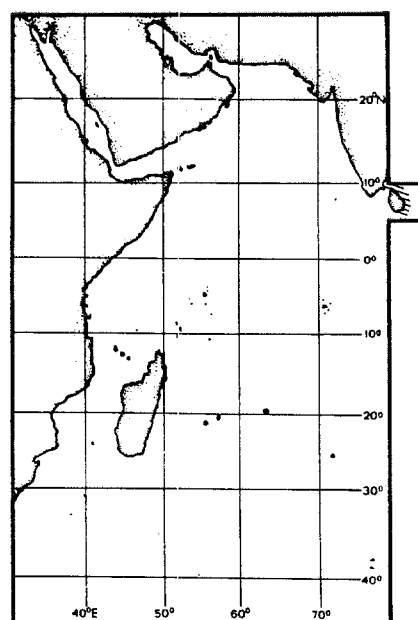
The species is apparently abundant in the lagoons and the sea off north-east Sri Lanka.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with shrimp trawls, gill nets, stake nets and other set gear, scoop nets and push nets (the last 2 for juveniles).

Probably marketed fresh, frozen or dried.

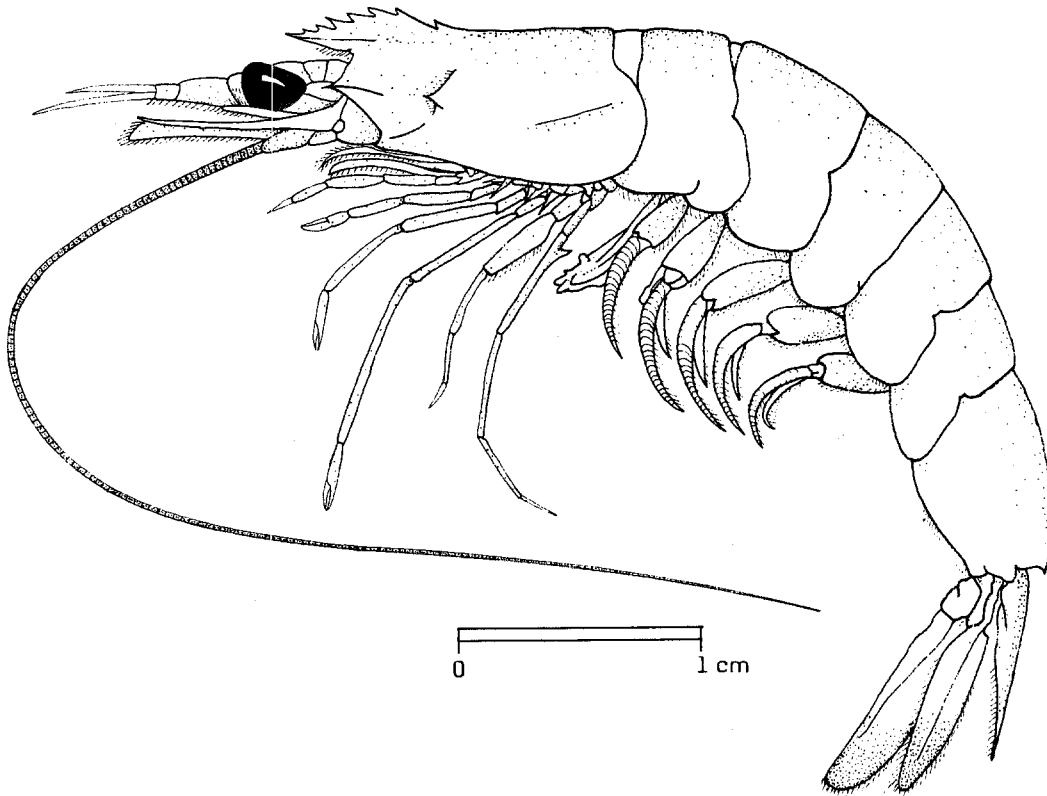


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Metapenaeus lysianassa* (De Man, 1888)

OTHER SCIENTIFIC NAMES STILL IN USE: None



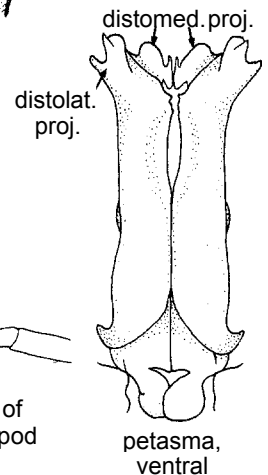
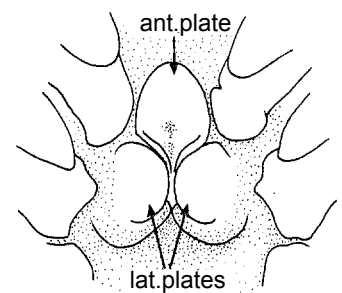
## VERNACULAR NAMES:

FAO: En - Bird shrimp  
Fr - Crevette oiseau  
Sp - Camarón parancero

NATIONAL:

## DISTINCTIVE CHARACTERS:

Almost entire body pubescent; rostrum very short, reaching as far as middle of first antennular article and armed with 6 or 7 teeth along entire dorsal margin, rostral crest high; postrostral ridge ending near posterior margin of carapace; adrostral crest and groove reaching as far as third rostral tooth; branchiocardiac groove not reaching to middle of carapace; telson armed only with spinules; ischial spine on first pereopod absent or minute. In adult males, merus of fifth pereopod with a proximal notch followed by a large, slightly arcuate triangular tooth; distolateral projections of petasma bifurcate distally; distomedian projections with a minute filament on their median margins. In females, anterior and lateral plates of thelycum subequal in size, anterior plate tongue-like and grooved, posterior plates suboval with thick median margins; impregnated fertilized specimens with white conjoined pads on thelycum.

merus of  
fifth pereopod  
(male)petasma,  
ventral

thelycum

Colour: body, pereopods and pleopods pale yellow with grey specks; antennae and distal part of uropods grey.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

All other Metapenaeus species occurring in the area can be distinguished from M. lysianassa by the configuration of petasma and thelycum. Further distinguishing characters of these species are:

M. brevicornis and M. dobsoni: rostrum toothless on distal half or slightly less, and reaching at least to second antennular article (toothless along entire dorsal margin and reaching to middle of first antennular article in M. lysianassa); adrostral crest and groove reaching at least to second rostral tooth (reaching only to third tooth in M. lysianassa); furthermore, in M. dobsoni the rostral crest is low..

Remaining species of Metapenaeus: rostrum reaching at least to middle of second antennular article and generally armed with more than 7 teeth (6 or 7 teeth in M. lysianassa); adrostral groove ending behind epigastric tooth; in males, merus of fifth pereopod without such a large tooth as in M. lysianassa.

## SIZE:

Maximum total length: males, 6.1 cm; females, 9 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs along the Indian coast as far north as the Mysore and Goa Provinces and off Sri Lanka. Further east it extends as far as the Gulf of Tonkin, the Indonesian Archipelago and Borneo.

Usually found on mud from the shore to about 28 m depth.

## PRESENT FISHING GROUNDS:

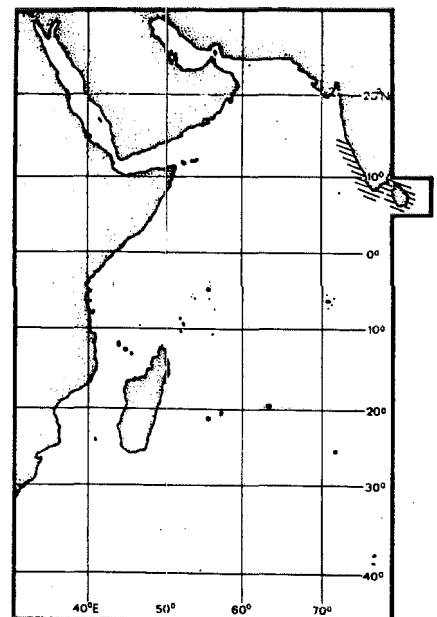
Sporadically found in the landings, among other shrimps, along the Indian coast.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mainly with traditional gear: stake nets, traps and other set nets, push nets and shore seines; also taken by drift nets and otter trawls.

Marketed fresh or dried (local consumption).

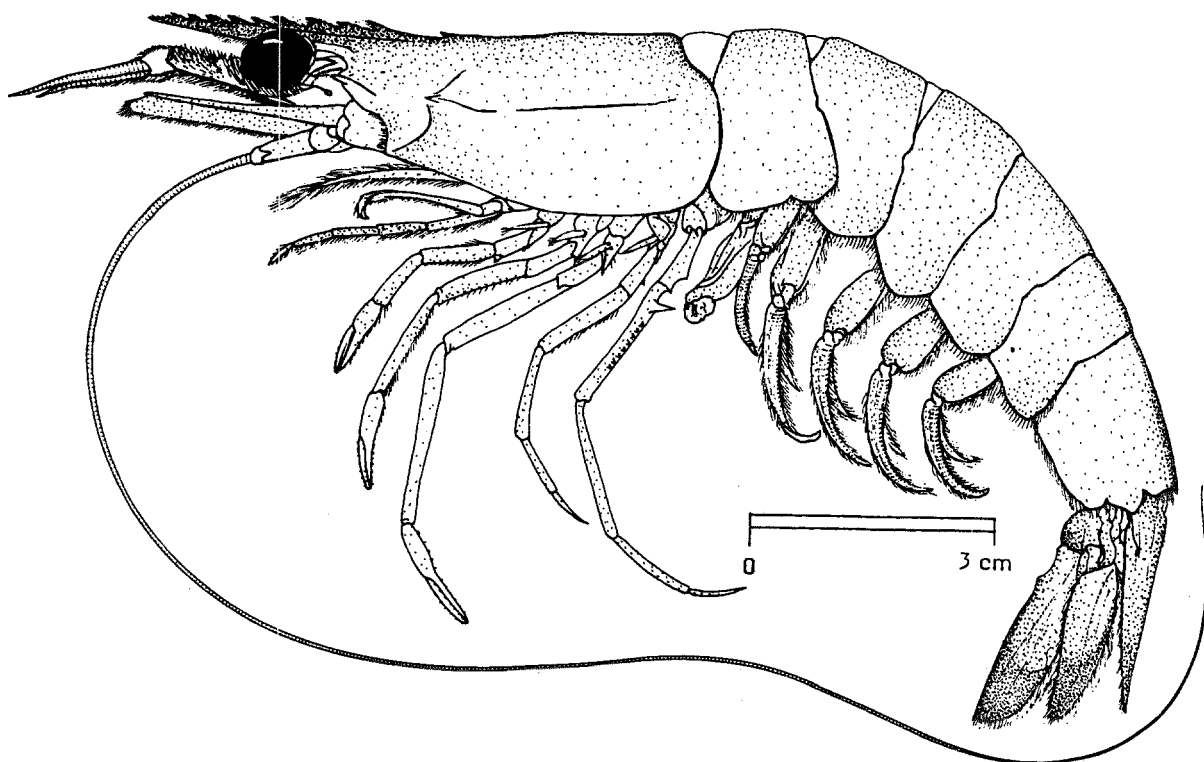


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)Metapenaeus monoceros (Fabricius, 1798)

OTHER SCIENTIFIC NAMES STILL IN USE : None



## VERNACULAR NAMES:

FAO : En - Speckled shrimp  
Fr - Crevette mouchetée  
Sp - Camarón moteado

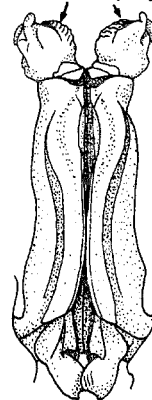
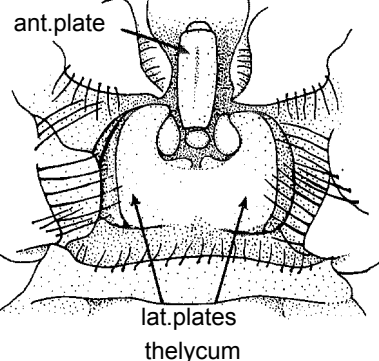
NATIONAL:

## DISTINCTIVE CHARACTERS:

Almost entire body pubescent, or in East Africa (except the Red Sea), pubescence restricted to dorsal part of carapace and abdominal patches; rostrum armed with 9 to 12 teeth along entire dorsal margin, straight, reaching as far as, or beyond, tip of antennular peduncle; postrostral crest reaching posterior margin of carapace or nearly so; adrostral crest ending behind second rostral tooth, adrostral groove behind epigastric tooth; branchiocardiac ridge sinuous, reaching posterior extension of hepatic spine; telson armed only with spinules; a small ischial spine on first pereopod. In adult males, merus of fifth pereopod with a proximal notch followed by a long, inwardly curved spiniform process and a row of tubercles; distomedian projections of petasma convoluted, greatly swollen, bulbiform, directed anterolaterally and concealing distolateral projections in ventral view. In females, anterior plate of thelycum long and deeply grooved; lateral plates with strongly raised lateral margins forming 2 longitudinal crests.

Colour: body pink, green-greyish or whitish with brown specks; rostral and middorsal abdominal crests brown; antennae red; pereopods and pleopods of same colour as body, sometimes more intensely pink; distal part of uropods purple-blue, external margin of exopods red.

distomed.proj.

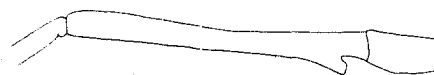
petasma,  
ventral view

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

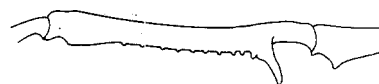
Metapenaeus ensis: different configuration of petasma and thelycum; within Fishing Area 51, restricted to Sri Lanka.

M. kutchensis, M. affinis and M. elegans: different configuration of petasma and thelycum; in males, merus of fifth pereopod with a tubercle (with a long spiniform process in M. monoceros); in M. affinis, tip of uropods pale (purple-blue in M. monoceros); furthermore, M. kutchensis is restricted to the Gulf of Kutch in India and M. elegans has been reported only from Sri Lanka within Fishing Area 51.

Other species of Metapenaeus: different configuration of petasma and thelycum; distal part of uropods not purple-blue. Furthermore, these species differ from M. monoceros by at least one of the following characters: rostrum very short; rostrum toothless on distal third to half; branchiocardiac ridge absent, or distinct only on posterior third of carapace (reaching posterior extension of hepatic spine in M. monoceros).



M. elegans



M. monoceros

merus of fifth pereopod (male)

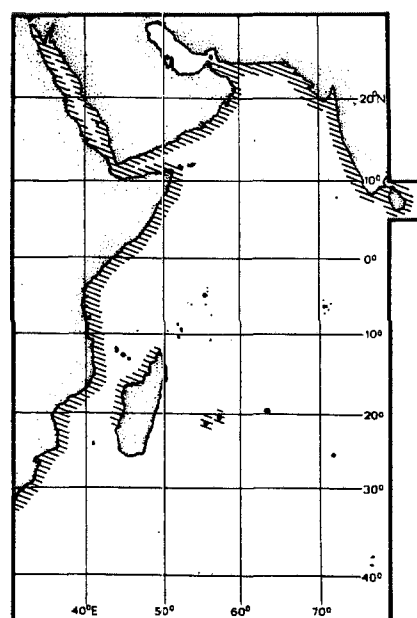
## SIZE:

Maximum total length: males, 15 cm; females, 20 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Occurs throughout the area, from South Africa to south India, including the Red Sea, Madagascar, Mauritius, La Réunion and Sri Lanka, but absent from the "Gulf": Further east, it extends as far as the Malay Peninsula; it has entered the eastern Mediterranean through the Suez Canal.

Usually found from the coastline to depths of about 70 m (but it has been fished down to 170 m in an exploratory survey off Pakistan), mainly on mud, sandy-mud or silt; juveniles inhabit estuaries, backwaters or are close to the shore; along the southwest coast of India it breeds in 50 to 60 m depth.



## PRESENT FISHING GROUNDS:

One of the most important species of shrimp in the area and of major commercial importance almost throughout its range; it is particularly important in Mozambique, the west coast of Madagascar and, to a lesser extent, in India.

The species is cultivated in Pakistan and India.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Offshore, it is caught mainly with shrimp trawls; in inshore and near-shore waters several other types of gear are also used: boat seines, shore seines, gill nets, stake nets and other set gear, cast nets, push nets and scoop nets (the last 2 only for juveniles).

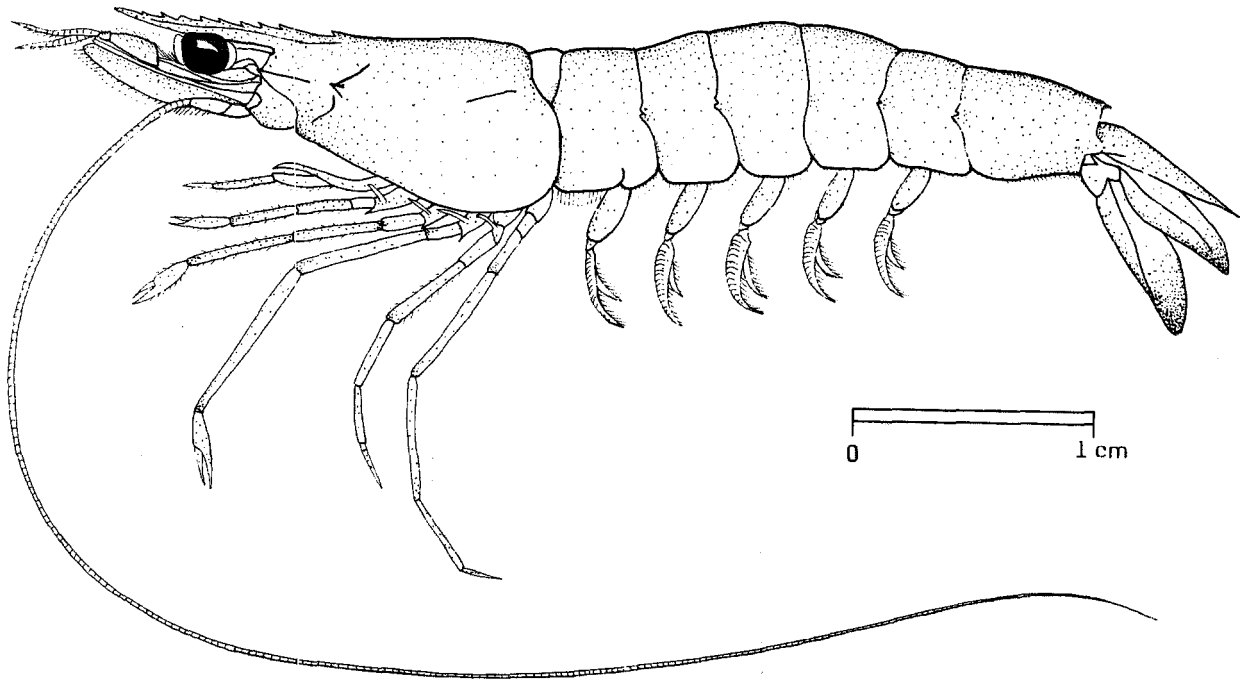
Marketed fresh, frozen, canned, peeled, cooked or fried in paste; small size shrimps are also used as bait.

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Metapenaeus moyebi* (Kishinouye, 1896)

## OTHER SCIENTIFIC NAMES STILL IN USE:

*Metapenaeus burkenroadi* Kubo, 1954  
*Metapenaeus mastersii* sensu Hall, 1962

## VERNACULAR NAMES:

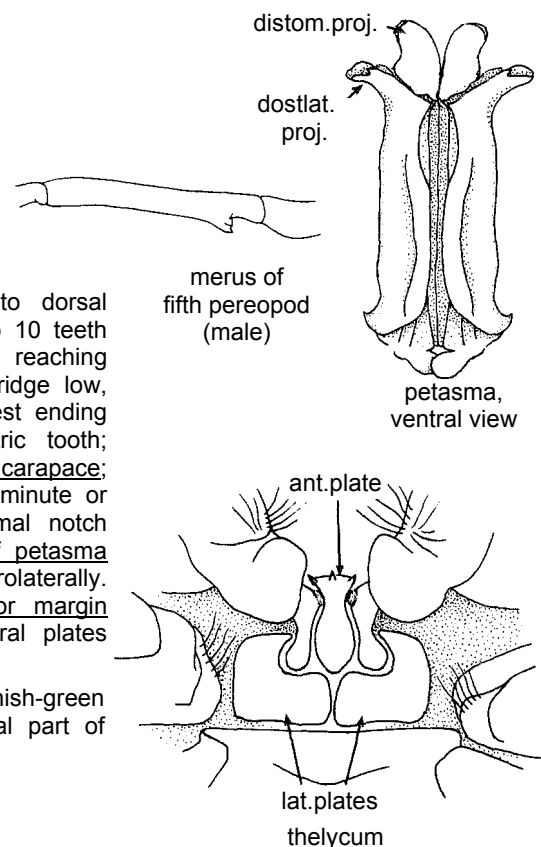
FAO : En - Moyebi shrimp  
Fr - Crevette moyebi  
Sp - Camarón moyebi

NATIONAL:

## DISTINCTIVE CHARACTERS:

Pubescence covering almost entire body or confined to dorsal carapace and a few abdominal patches; rostrum armed with 7 to 10 teeth along entire dorsal margin, nearly straight, slightly uptilted and reaching distal half of third antennular article or just beyond; postrostral ridge low, generally ending near posterior margin of carapace; adrostral crest ending behind second rostral tooth, adrostral groove behind epigastric tooth; branchiocardiac ridge feeble, ending near posterior third of carapace; telson armed only with spinules; ischial spine on first pereopod minute or absent. In adult males, merus of fifth pereopod with a proximal notch followed by a twisted keeled tubercle; distomedian projections of petasma laminose and diverging; distolateral projections directed anterolaterally. In females, anterior plate of thelycum flask-shaped, its anterior margin slightly convex and bearing 3 tubercles of subequal size; lateral plates kidney-shaped, often with angular contours.

Colour: body semi-translucent pale green with brownish-green specks; pereopods and pleopods of same colour as body; distal part of uropods green.



### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Other species of Metapenaeus: very different configuration of petasma and thelycum. Furthermore, these species differ from M. moyebi by at least one of the following characters: rostrum very short; rostrum toothless on distal third to half; branchiocardiac ridge absent, or distinct only on posterior third of carapace (reaching posterior extension of hepatic spine in M. moyebi).

### **SIZE:**

Maximum total length: males, 8.3 cm; females, 12.6 cm.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, it occurs along the southern coast of India (Tamilnadu Province) and the west and north coasts of Sri Lanka. Further east it extends as far as the Philippines, China and Japan.

Found on mud or sandy-mud in estuaries, backwaters and near-shore waters to about 45 m depth; in Sri Lanka it is more abundant in high salinity lagoons; apparently it breeds in shallow waters.

### **PRESENT FISHING GROUNDS:**

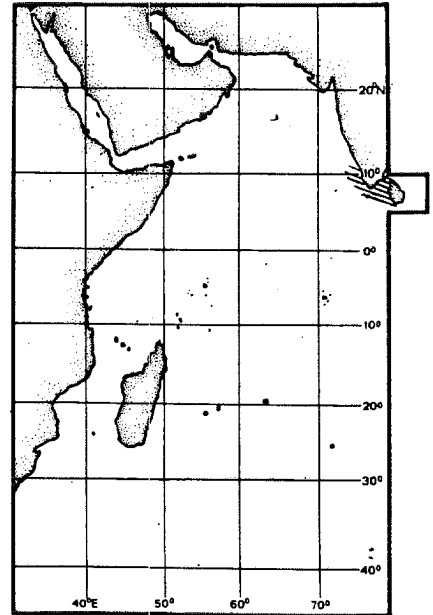
Fished in Sri Lanka and on the south-east coast of India, but of very minor commercial importance.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with stake nets and other set gear, skimming nets, scoop nets, push nets, gill nets, shore seines, beam trawls and otter trawls.

Marketed mainly fresh, dried, and peeled and cooked.

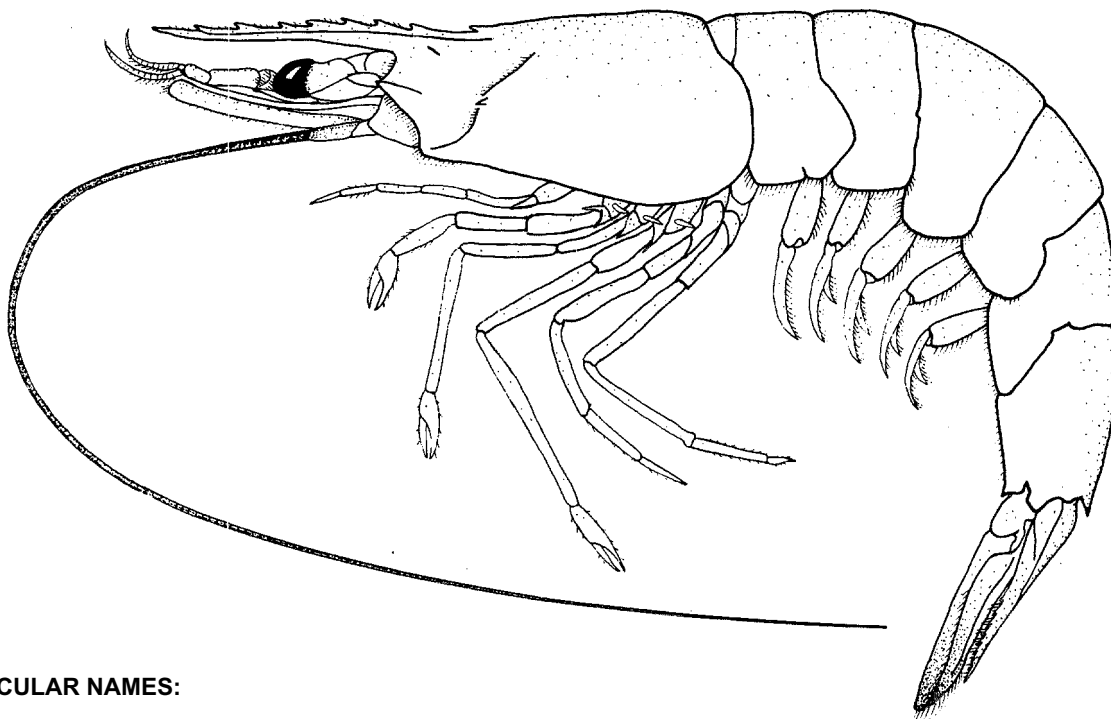


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)Metapenaeus stebbingi Nobili, 1904

OTHER SCIENTIFIC NAMES STILL IN USE: None



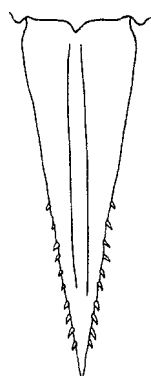
## VERNACULAR NAMES:

FAO: En - Peregrine shrimp  
Fr - Crevette faugon  
Sp - Camarón peregrino

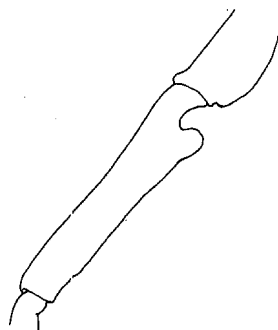
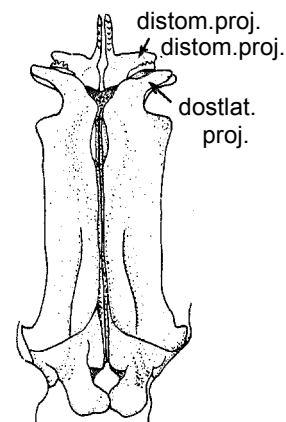
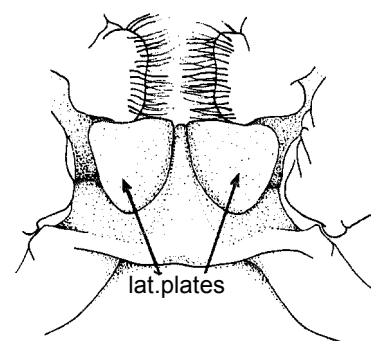
NATIONAL:

## DISTINCTIVE CHARACTERS:

Almost entire body hairless; rostrum armed with 7 to 10 teeth along entire dorsal margin, reaching or exceeding distal margin of antennular peduncle except for specimens from the Gulf in which it only reaches distal margin of second antennular article; postrostral ridge broad and low, ending near middle of carapace; branchio-cardiac ridge indistinct; telson armed on each side with a row of small, movable spines; ischial spine on first pereopod absent. In adult males, merus of fifth pereopod with a proximal notch followed by a keel-shaped tubercle; each distomedian projection of petasma with a stiff, styliform appendix directed forward and ventrally serrated;



telson

merus of fifth  
pereopod (male)petasma,  
ventral view

thelycum

distolateral projections directed laterally and separate in ventral and dorsal processes. In females, thelycum with posterior transverse ridge protruding forward between lateral plates and forming an inverted T-shape plate; lateral plates triangular.

Colour: body, pereopods and pleopods white to creamy-yellow with grey and rust coloured specks; antennae and distal part of uropods rusty colour to grey-purplish.

#### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

All other Metapenaeus species occurring in the area can be distinguished from M. stebbingi by the configuration of petasma and thelycum. Further distinguishing characters of these species are:

M. affinis, M. elegans, M. ensis and M. monoceros: postrostral crest ending near posterior margin of carapace ending near middle of carapace in M. stebbingi; branchiocardiac ridge distinct and usually reaching posterior extension of hepatic spine (absent in M. stebbingi); body at least partly pubescent (body hairless in M. stebbingi); furthermore, M. ensis and M. elegans have been reported only from Sri Lanka in Fishing Area 51.

M. brevicornis, M. dobsoni and M. lysianassa: either rostrum toothless on about distal half (armed along entire dorsal margin in M. stebbingi), or very short reaching only to middle of first antennular article (reaching at least to distal margin of second antennular article in M. stebbingi); in M. brevicornis, rostrum with 5 to 7 teeth (7 to 10 teeth in M. stebbingi), and M. dobsoni and M. lysianassa have a different geographical distribution.

#### **SIZE:**

Maximum total length: males, 11.1 cm; females, 13.9 cm.

#### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

All along the coast from South Africa to the Gulf of Kutch in north-west India, including the Red Sea and the "Gulf," also present along the west coast of Madagascar; the species has entered the eastern Mediterranean through the Suez Canal.

Found from the shore to about 90 m depth on soft bottom, mud or sand; juveniles inhabit near-shore, and adults deeper waters, but usually in less than 45 to 50 m depth.

#### **PRESENT FISHING GROUNDS:**

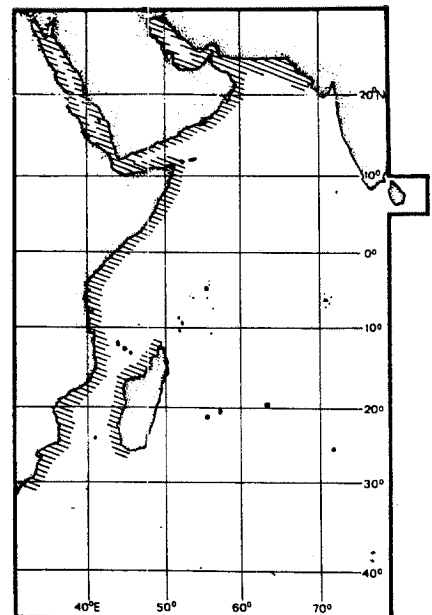
The species is fished off Africa, including the Red Sea, and on the west coast of Madagascar, but is of minor commercial importance; in the "Gulf" it is one of the important species in the artisanal fisheries and is of commercial importance in Pakistan.

#### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with bottom trawls, stake nets and other set gear, shore seines, cast nets, scoop nets and push nets.

Marketed mainly fresh, frozen and dried.



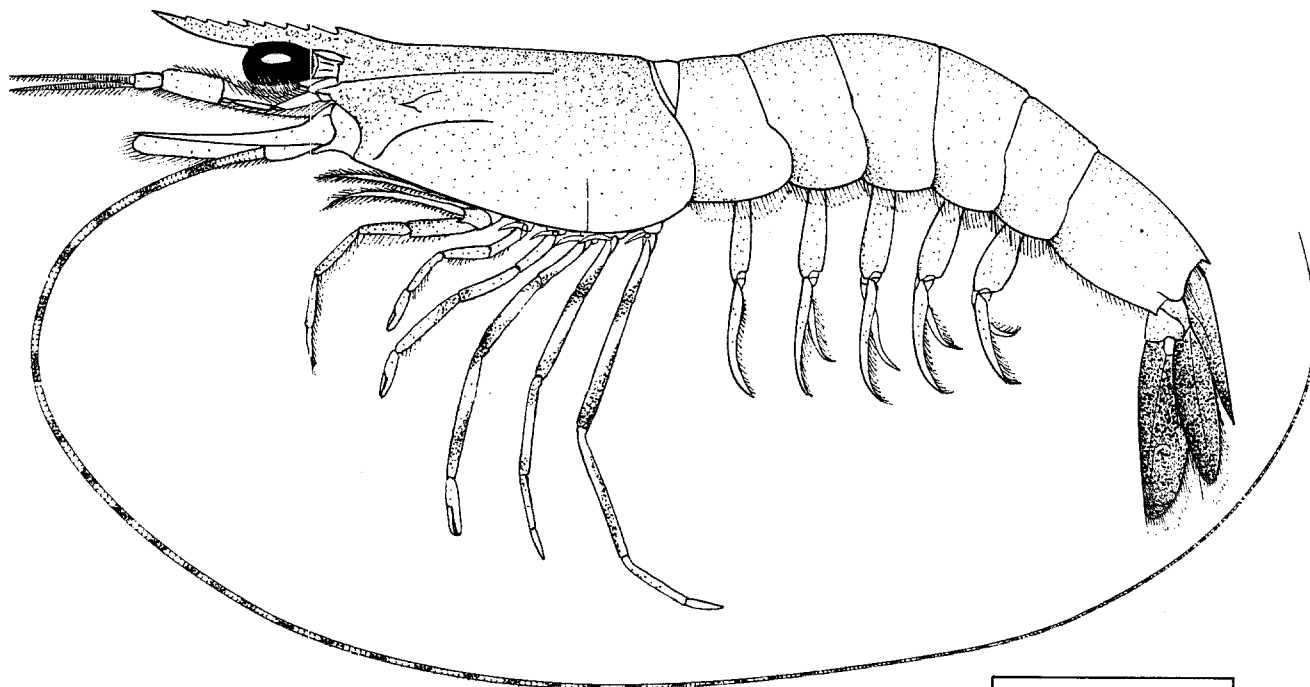
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Parapenaeopsis acclivirostris* Alcock, 1905

OTHER SCIENTIFIC NAMES STILL IN USE: None



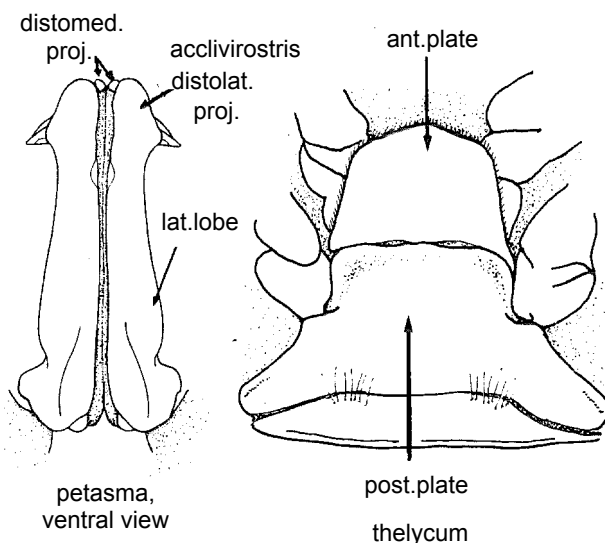
VERNACULAR NAMES:

- FAO : En - Hawknose shrimp
- Fr - Crevette aquiline
- Sp - Camarón aguileno

NATIONAL

DISTINCTIVE CHARACTERS:

Rostrum nearly straight, uptilted and armed with 6 to 9 teeth along entire dorsal margin, reaching or exceeding third antennular article in females, not extending beyond distal margin of second article in males; epigastric tooth absent; postrostral crest broad ending near middle of carapace; longitudinal suture reaching 2/3 of carapace length; antennular flagella 0.3 to 0.4 times the length of carapace; epipod absent on first and second pereopods; basal spine present on first and second pereopods; basis of third pereopod and telson unarmed. In males, distolateral projections of petasma with distal part slender, in dorsal position and directed proximolaterally distance between tip of projections about 2/5 of length of petasma; distomedian projections very small; lateral lobes of petasma without wing-like projections. In females, anterior plate of thelycum semicircular and concave; posterior plate broad and trapezoidal.



Colour: pale with dull red specks. on carapace; antennal flagella and pereopods banded with dark pink; pleopods orangish; uropods and telsci, dark red.



#### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of *Parapenaopsis*: epigastric tooth present (absent in *P. acclivirostris*); postrostral crest ending on posterior part of carapace (near middle of carapace in *P. acclivirostris*); epipod present on first 2 pereopods (absent in *P. acclivirostris*); different configuration of petasma and thelycum.

#### SIZE:

Maximum total length: males, 4.7 cm; females, 7.3 cm.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, from south and east Africa to the west coast of India, in the "Gulf" and off the west coast of Madagascar (Europa Island). Also present on the east coast of India.

Found from near the coastline to about 50 m depth.

#### PRESENT FISHING GROUNDS:

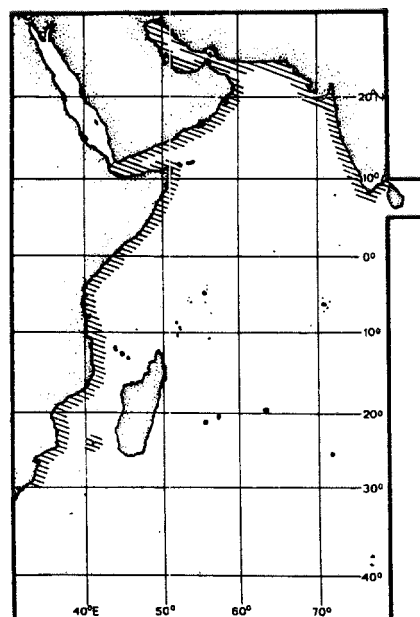
Present sporadically in the landings; along the west coast of India it occurs in small numbers together with other commercially important prawns.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION::

Separate statistics are not reported for this species.

Caught with shrimp trawls, gill nets, seines and other artisanal gear.

Marketed fresh, dried or cooked.

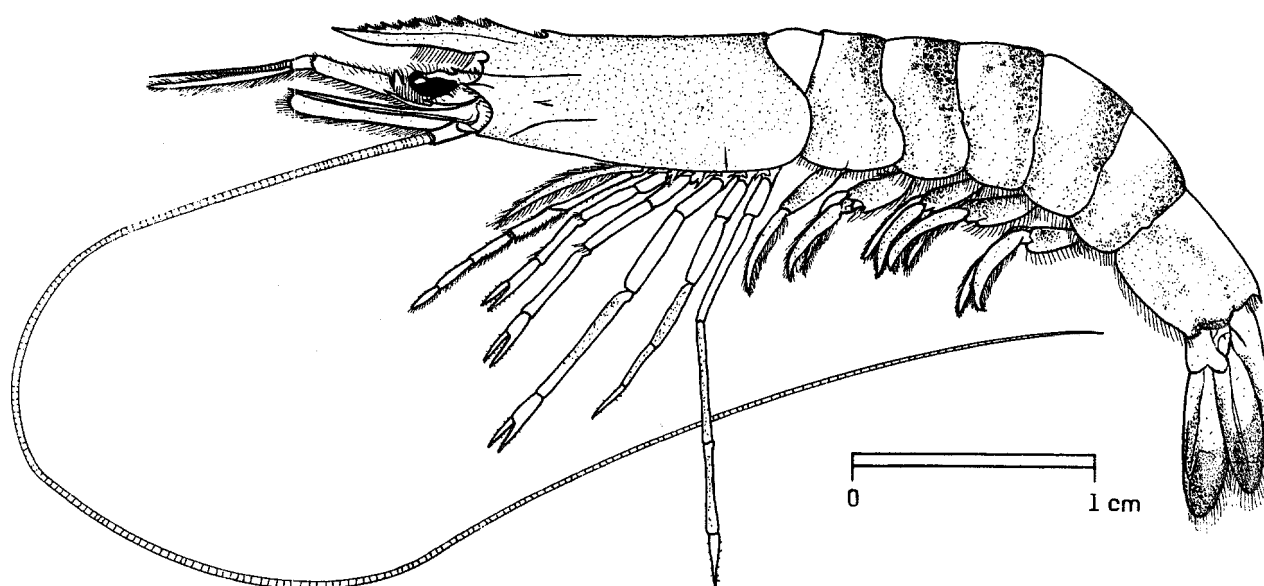


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

*Parapenaeopsis cornuta* (Kishinouye, 1900)FISHING AREA 51  
(W. Indian Ocean)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

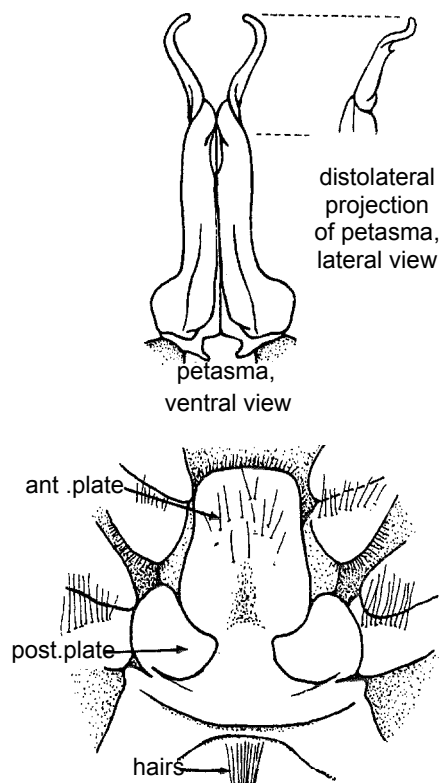
FAO : En - Coral shrimp  
Fr - Crevette corail  
Sp - Camarón coral

NATIONAL:

## DISTINCTIVE CHARACTERS:

Rostrum slightly sigmoidal or straight, tip uptilted, sometimes toothless on distal 1/4, reaching from middle of second to distal margin of third antennular article and armed with 7 or 8 (rarely 9) dorsal teeth; epigastric tooth present; postrostral crest ending near posterior margin of carapace; longitudinal suture reaching about 0.4 of carapace length; antennular flagella 0.4 to 0.6 times the length of carapace; epipod and basal spine present on first and second pereopods; basis of third pereopod unarmed in both sexes; telson armed with 2 to 4 pairs of distolateral spinules. Petasma (in males) with long and slender, horn-like distolateral projections, diverging proximally and curving inward distally, each with a small dorsal spiniform process; distomedian projections extremely small. In females, anterior plate of thelycum oblong and concave, fused posteromedially with posterior plate the latter with a pair of lateral depressions; a median tuft of long setae (hairs) behind the thelycum.

Colour: pale brown or faintly pinkish with brown-grey specks and dorsal transverse brown bands on abdomen; pereopods whitish, pleopods brownish, both speckled; uropods dark grey distally. thelycum

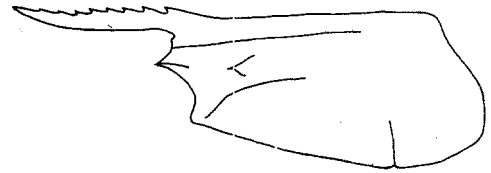


## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

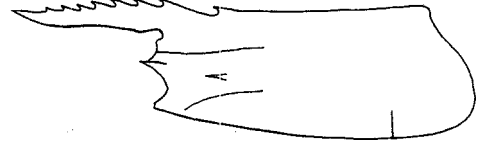
All other species of the genus can be distinguished from *Parapenaeopsis cornuta* by the configuration of petasma and thelycum. Further distinguishing characters of these species are:

*P. maxillipedo*: rostrum usually with 9 or 10 teeth (usually 7 or 8 in *P. cornuta*); telson unarmed (2 to 4 pairs of spinules in *P. cornuta*); third pereopod with a basial spine (absent in *P. cornuta*); a pale stripe along margins of uropods (absent in *P. cornuta*).

Other species of *Parapenaeopsis*: longitudinal suture reaching at least 2/3 of carapace (not reaching half of carapace in *P. cornuta*); furthermore, epigastric tooth absent in *P. acclivirostris*; postrostral crest grooved in *P. uncta*, females of *P. hardwickii*, and often in *P. sculptilis*; telson with fixed subapical spines in *P. coromandelica* and *P. stylifera*.



*P. acclivirostris*



*P. cornuta*  
carapace

## SIZE:

Maximum total length: males, 5 cm; females, 8.2 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, on the west and south coasts of India from Maharashtra to Tamilnadu and off Sri Lanka. Further east it extends as far as Japan and north Australia but its distribution is scattered.

Found from the coastline to 40 m depth on sandy-mud or mud; in Sri Lanka it is mostly found at the mouth of estuaries but rarely at sea; more available at night.

## PRESENT FISHING GROUNDS:

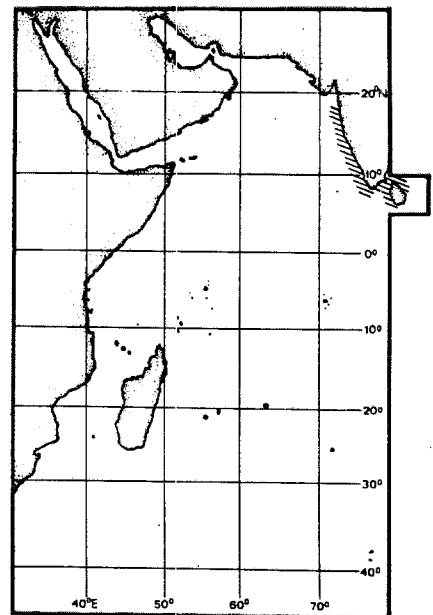
The species occurs in the fishery off the Maharashtra coast of India; in Sri Lanka it is not common.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with shrimp trawls, seines, stake nets and several other artisanal gear.

Marketed mainly fresh, dried or cooked.



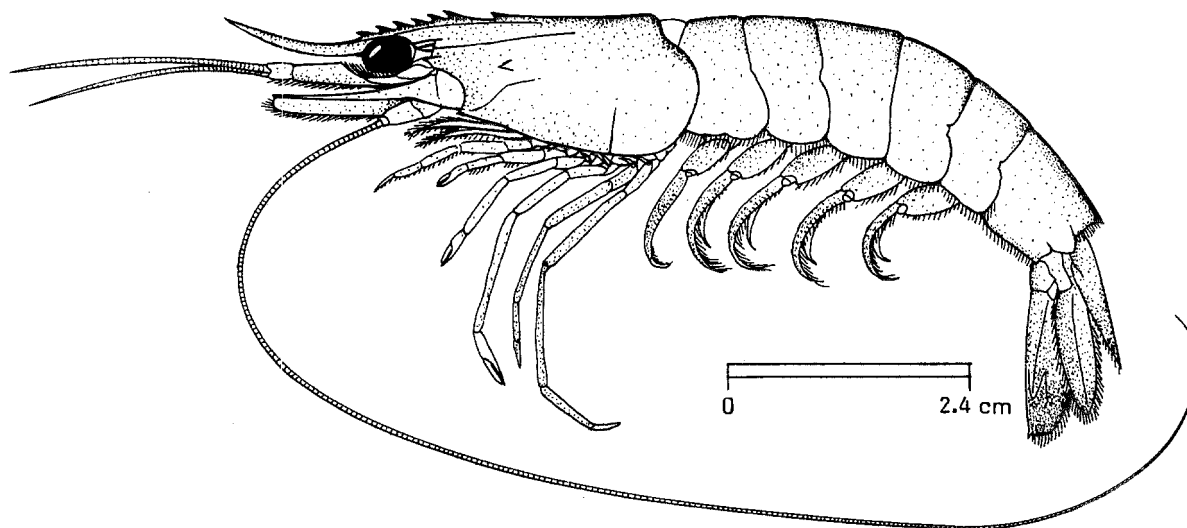
FAO SPECIES IDENTIFICATION SHEETS

FAMILY : PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

Parapenaeopsis coromandelica Alcock, 1906

OTHER SCIENTIFIC NAMES STILL IN USE: Parapenaeopsis stylifera coromandelica Alcock, 1906



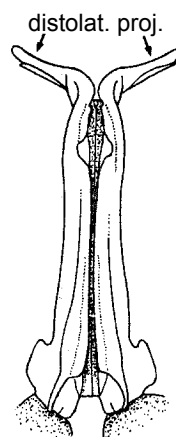
VERNACULAR NAMES:

- FAO :           En - Coromandel shrimp
- Fr - Crevette coromandel
- Sp - Camarón coromandel

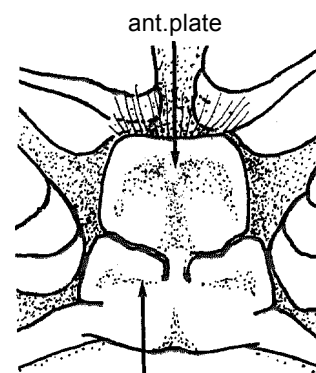
NATIONAL:

DISTINCTIVE CHARACTERS:

Rostrum sigmoidal, toothless on at least distal half (usually more), armed at base with 6 to 8 dorsal teeth, strongly upcurved and much overreaching tip of antennular peduncle, in some males somewhat shorter; epigastric tooth present; pcstrostral crest almost reaching posterior margin of carapace; longitudinal suture reaching 2/3 of carapace length; telson armed with 1 or 2 pairs of subapical, fixed spines (the second pair, when present, much smaller than distal pair); antennular flagella slightly longer than carapace; epipod and basal spine present on first and second pereopods; basis of third pereopod unarmed. In males, distolateral projections of petasma slender, horn-like and straight, directed anterolaterally, with ventro-external openings; distomedian projections small and curved ventrally. In females, anterior plate of thelycum square and concave, with a slender stem-like posterior process; posterior plate deeply notched anteromedially.



petasma, ventral view



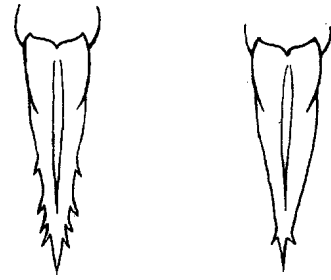
post. plate

Colour: usually grey, sometimes grey-reddish or brownish; rostrum and abdominal crest darker; pereopods and pleopods pale brown to red or greyish; uropods usually grey or brownish, sometimes brown-red.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Parapenaeopsis stylifera: telson armed with 4 pairs of lateral fixed spines 1 or 2 pairs of subapical fixed spines in P. coromandelica; tips of uropods distinctly white (uropods uniformly coloured in P. coromandelica).

Other species of Parapenaeopsis: telson unarmed or armed only with mobile spinules; rostrum toothless at most on distal half (unarmed at least on distal half in P. coromandelica); different configuration of petasma and thelycum. Furthermore the longitudinal suture reaches at most middle of carapace in P. cornuta and P. maxillipedo; the postrostral crest is grooved in P. uncta, females of P. hardwickii, and often in P. sculptilis; in P. acclivirostris, an epipod is present on first 2 pereopods.



P. stylifera

P. coromandelica  
telson

## SIZE:

Maximum total length: males and females, 12 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs in the southern part of India (Kerala and Tamilnadu) and off Sri Lanka. Further east it extends as far as the Gulf of Thailand, the Indonesian Archipelago and Borneo.

Found in shallow water to about 11 m depth, mainly on mud; in Sri Lanka, although very abundant at sea, it is not found in lagoons.



P. cornuta

P. coromandelica  
rostrum

## PRESENT FISHING GROUNDS:

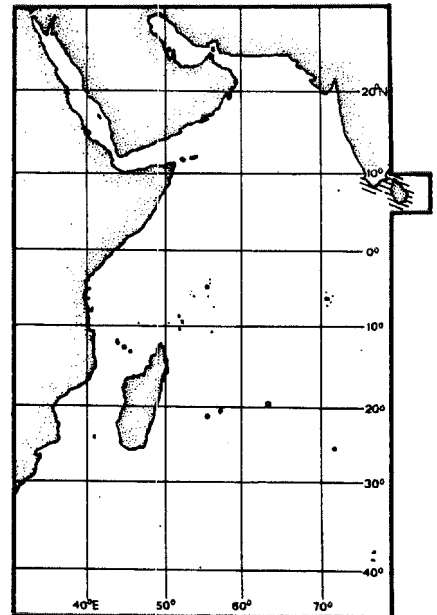
Off the west coast of Sri Lanka, where it is very abundant; also in south India.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mainly with artisanal gear and particularly with seine nets; also taken by shrimp gill nets.

Marketed fresh, frozen, canned and as prawn meal.



## FAO SPECIES IDENTIFICATION SHEETS

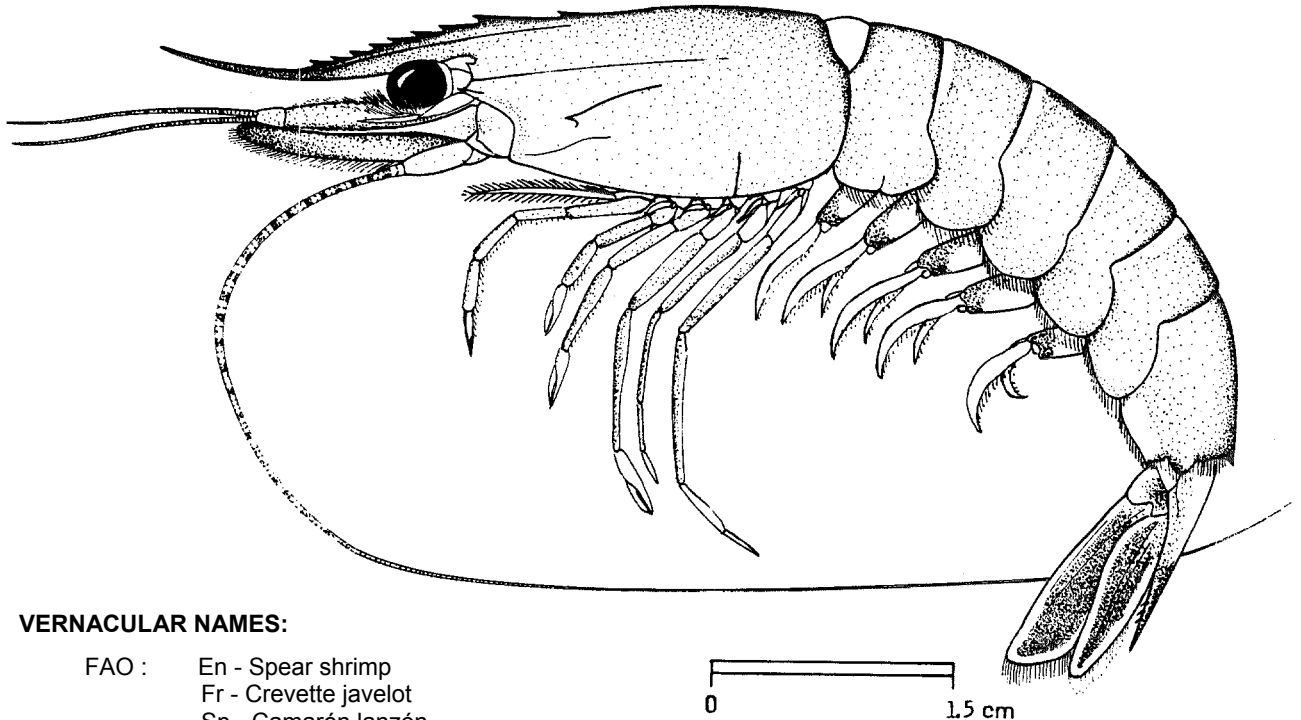
1983

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Parapenaeopsis hardwickii* (Miers, 1878)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Spear shrimp  
Fr - Crevette javelot  
Sp - Camarón lanzón

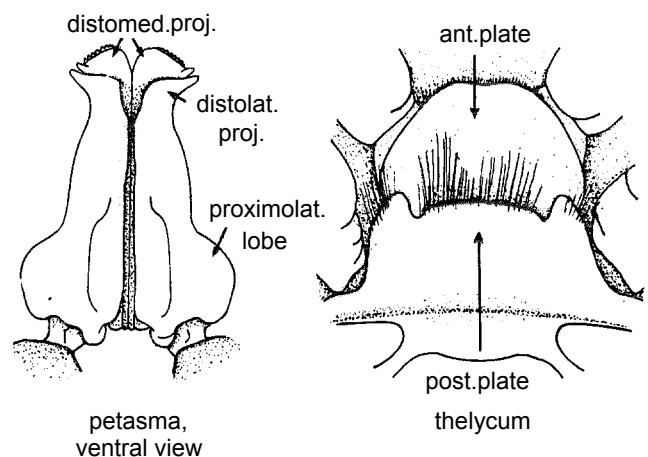
NATIONAL:

## DISTINCTIVE CHARACTERS:

Rostrum armed with 8 to 10 dorsal teeth; in females, sigmoidal, toothless on distal 1/3 to 1/2, upcurved and exceeding antennular peduncle; in large males curving downward, unarmed portion absent and reaching middle of second antennular article; both shapes found in young males. Epigastric tooth small; postrostral crest almost reaching posterior margin of carapace, grooved in females; longitudinal suture reaching 3/4 or more of carapace length; telson armed with 3 to 5 (usually 4) pairs of small mobile spines; antennular flagella at least 0.6 times the

length of carapace, usually longer; epipod and basal spine present on first and second pereopods; basis of third pereopod unarmed. Petasma (in males) with distomedian projections wing-like, wider than long, their anterior margin often crenulate; distolateral projections short and directed laterally; proximolateral lobes very large, curved dorsally. Thelycum (in females) with anterior plate concave, rounded anteriorly; posterior plate flat, with a pair of anterolateral tooth-like projections, anteromedian margin slightly convex and bearing a transverse row of long setae hairs).

Colour: usually grey, sometimes with a touch of pink, rarely pink; rostrum and postrostral crest dark grey; pereopods brownish pink; pleopods usually reddish pink; uropods and telson grey or pink, each with a dark grey median longitudinal stripe.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

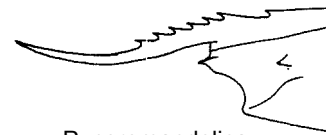
All other species of the genus can be distinguished from *Parapenaeopsis hardwickii* by the configuration of petasma and thelycum. Further distinguishing characters are:

*P. uncta* and *P. sculptilis*: large and distinct transverse bands on abdomen (uniformly coloured in *P. hardwickii*); telson unarmed (armed with 3 to 5 small mobile spines in *P. hardwickii*).

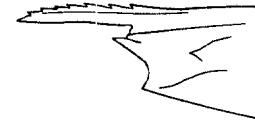
*P. cornuta* and *P. maxillipedo*: abdomen with dorsal transverse bands; longitudinal suture reaching at most middle of carapace (reaching at least 3/4 of carapace in *P. hardwickii*); telson unarmed in *P. maxillipedo*.

*P. coromandelica* and *P. stylifera*: rostrum toothless at least on distal half (at most on distal half in *P. hardwickii*); telson with fixed lateral spines; uropods without dark longitudinal stripes (present in *P. hardwickii*).

Other species of *Parapenaeopsis*: telson unarmed; furthermore, in *P. acclivirostris*, epipod absent on first two pereopods.



*P. coromandelica*



*P. hardwickii*  
rostrum

## SIZE:

Maximum total length: males, 11.1 cm; females, 13.5 cm.

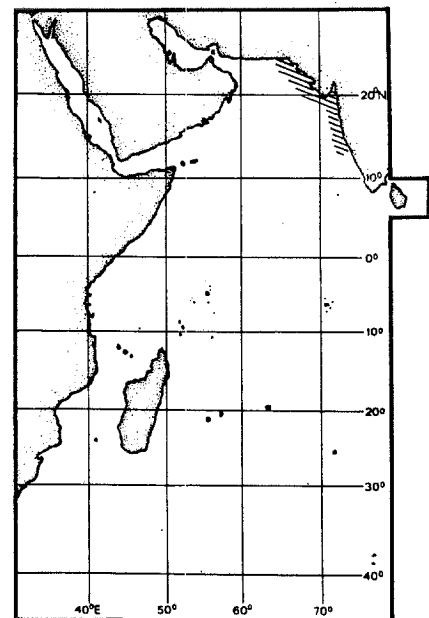
## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs from east Pakistan to Mysore in India. Further east it extends from the central east coast of India to Indonesia and China.

Found from the coastline to about 90 m depth on mud, sandy-mud or sand, sometimes mixed with shell fragments.

## PRESENT FISHING GROUNDS:

In Pakistan and along the northwest coast of India it is commonly found in the trawl catches but is of minor commercial importance; near Bombay the species is commercially fished.



## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with dol nets, stake nets, boat seines and otter trawls.

Marketed fresh, dried or canned.

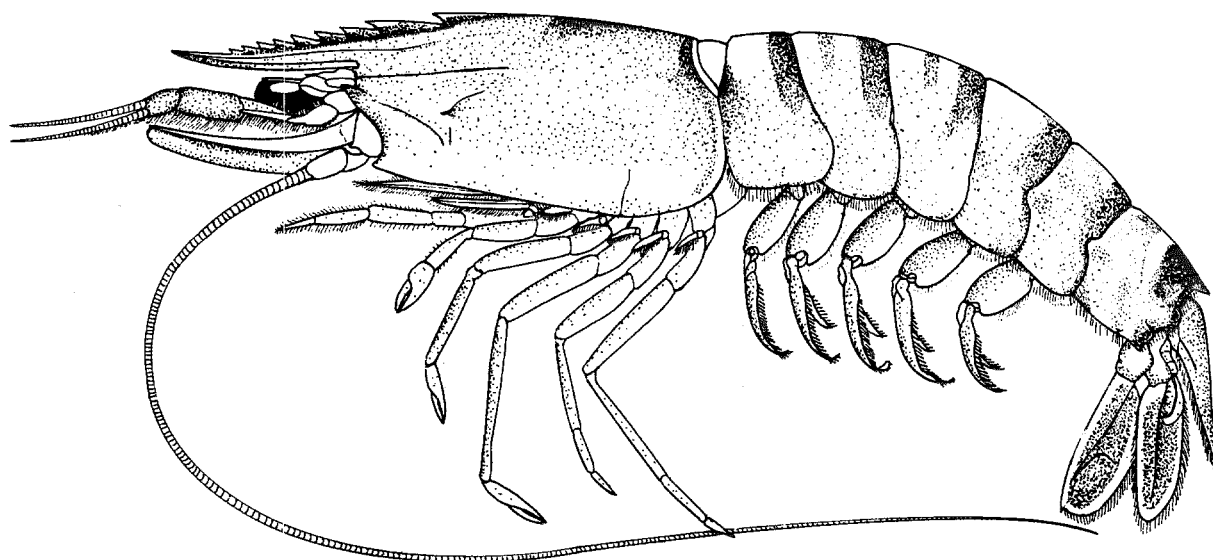
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

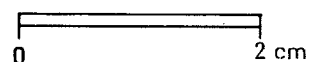
*Parapenaeopsis maxillipedo* Alcock, 1905

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

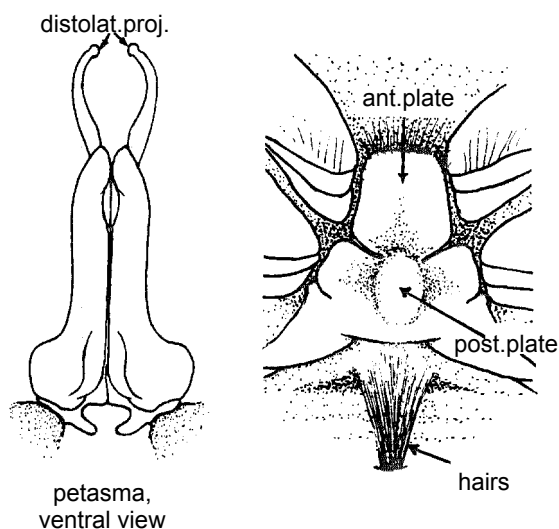
FAO :           En - Torpedo shrimp  
                  Fr - Crevette torpille  
                  Sp - Camarón torpedo



NATIONAL

## DISTINCTIVE CHARACTERS:

Rostrum straight, tip uptilted, generally toothless on distal 1/4, reaching from middle of second to distal margin of third antennular article and armed with 8 to 11 (usually 9 or 10) dorsal teeth; epigastric tooth present; postrostral crest reaching, or almost, posterior margin of carapace; longitudinal suture reaching 1/3 to 1/2 of carapace length; antennular flagella 0.35 to 0.55 times the length of carapace; epipod present on first and second pereopods; basal spine present on first 3 pairs of pereopods; telson unarmed. Petasma (in males) with long and slender, horn-like distolateral projections, diverging proximally and curving inward distally, without small dorsal spiniform processes; distomedian projections extremely small. In females, anterior plate of thelycum subquadrate, posteriorly depressed and medially fused to posterior plate, the latter with a pair of lateral depressions and a median boss; a median tuft of long setae (hairs) behind the thelycum.



Colour: usually grey, sometimes pale brown; rostrum and postrostral crest dark brown; abdomen with dorsal transverse dark bands; pereopods brownish; pleopods red to brown; uropods greenish to red-brown with a pale stripe along margins.

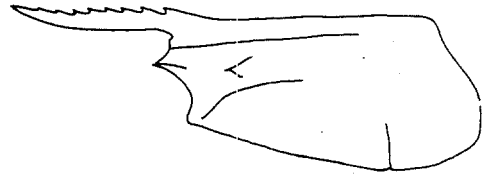


## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

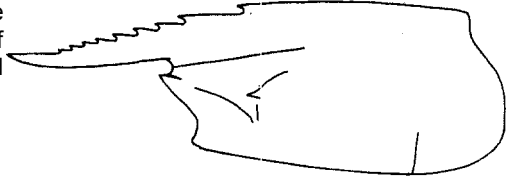
All other species of the genus can be distinguished from *Parapenaeopsis maxillipedo* by the configuration of petasma and thelycum. Further distinguishing characters are:

*P. cornuta*: rostrum usually with 7 or 8 teeth (usually 9 or 10 in *P. maxillipedo*); telson armed with 2 to 4 pairs of spinules (unarmed in *P. maxillipedo*); basal spine absent on third pereopod (present in *P. maxillipedo*)

Other species of *Parapenaeopsis*: longitudinal suture reaching at least 2/3 of carapace (reaching at most half of carapace in *P. maxillipedo*); basal spine absent on third pereopod.



*P. acclivirostris*



*P. maxillipedo*  
carapace

## SIZE:

Maximum total length: males, 10 cm; females, 12.5 (15?) cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs in India, from the Gulf of Kutch to the east coast, and Sri Lanka. Also present along the Malay Peninsula, Indonesia and New Guinea.

Found at sea in shallow waters of less than 30 m depth on mud-banks, sometimes also found on sandy-mud bottoms.

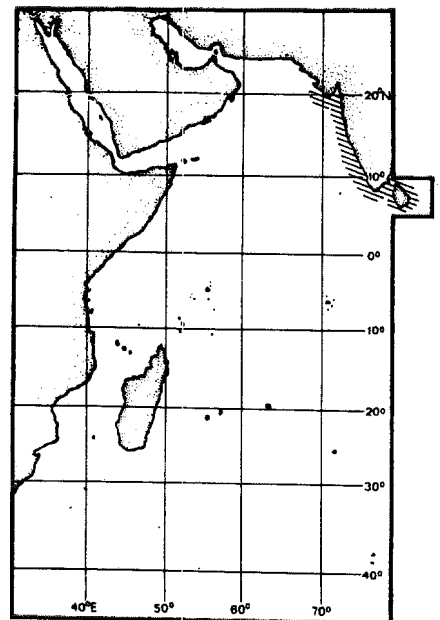
Present in small numbers in the landings along the west coast of India.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

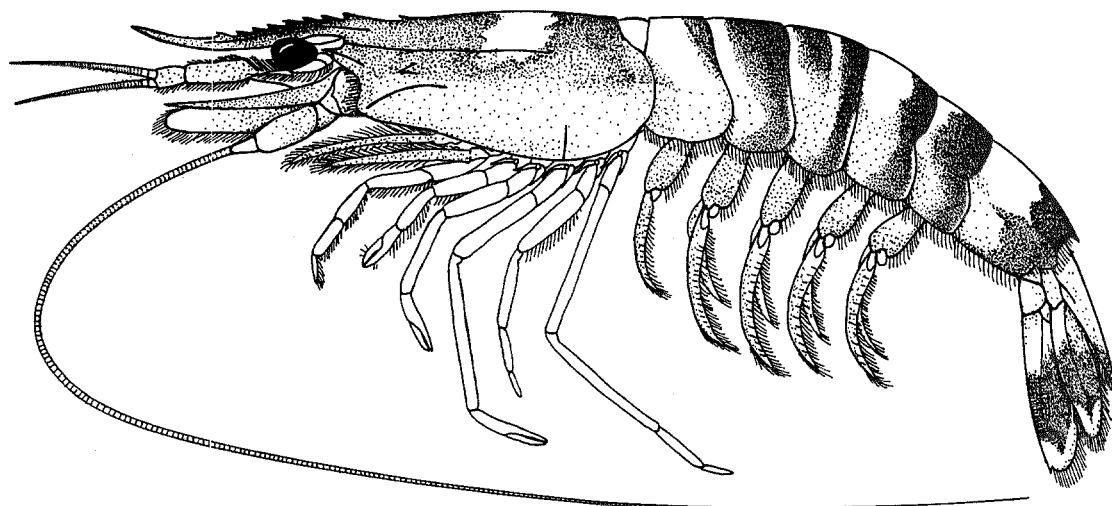
Caught with otter trawls, shrimp gill nets, push nets and shore seines.

Marketed fresh, dried or cooked.



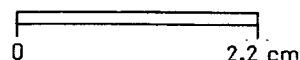
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

*Parapenaeopsis sculptilis* (Heller, 1862)FISHING AREA 51  
(W. Indian Ocean)OTHER SCIENTIFIC NAMES STILL IN USE: *Parapenaeopsis affinis* sensu Hall, 1962

## VERNACULAR NAMES:

FAO: En - Rainbow shrimp  
Fr - Crevette arc-en-ciel  
Sp - Camarón arco iris



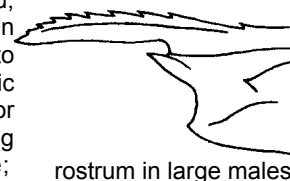
NATIONAL

## DISTINCTIVE CHARACTERS:

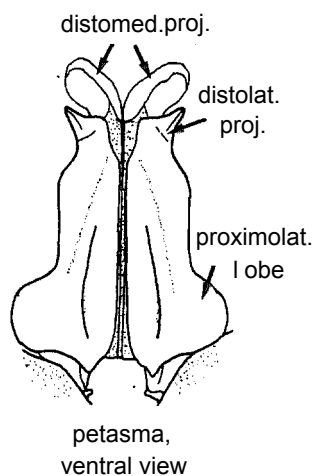
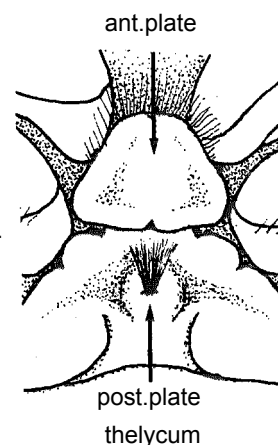
Rostrum armed with 7 to 9 dorsal teeth; in females, sigmoid-shaped, toothless, on distal third to half, upcurved and exceeding antennular peduncle; in large males, curving downward, the unarmed portion absent and only reaching to middle of second antennular article; both shapes found in young males; epigastric tooth small, absent in large males; postrostral crest almost reaching to posterior margin of carapace, feebly grooved or flat; longitudinal suture generally reaching 3/4 of carapace length; antennular flagella 0.4 to 0.6 times the length of carapace;

epipod and basal spines present on first and second pereopods; basis of third pereopod and telson unarmed. In males, petasma with long, rabbit ear-shaped disto-medial projections, deeply concave ventrally; disto-lateral projections short, directed anterolaterally; proximolateral lobes very large, and curved dorsally. In females, thelycum with anterior plate distally rounded and broadly articulating with posterior plate, the latter with a median tubercle bearing a tuft of long setae (hairs).

Colour: body pale with wide, dark brown - almost black - transverse bands; carapace dark brown dorsally, except for a white band about its middle, laterally much paler, yellow or orangish; bands on abdomen reaching ventrolateral margin; pereopods yellowish to pink; pleopods pink to dark red; uropods yellow to pink, with a very wide, dark brown middle transverse band.



rostrum in large males

petasma,  
ventral viewant.plate  
post.plate  
thelycum

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

None of the other Parapenaopsis species in the area have the characteristic configuration of petasma and thelycum, nor the complete, dark - almost black - transverse bands on abdomen of P. sculptilis. Further distinguishing characters of these species are the following:

P. uncta: rostrum with 9 to 11 teeth (7 to 9 in P. sculptilis); postrostral crest distinctly grooved (feebly grooved or flat in P. sculptilis); a distinct dorsoposterior dark brown patch on carapace (absent in P. sculptilis) and two bands on last segment (only one in P. sculptilis).

P. cornuta and P. maxillipedo: transverse bands on abdomen incomplete, restricted to dorsal surface; longitudinal suture reaching at most middle of carapace (to 1/4 of carapace length in P. sculptilis).

Other species of Parapenaopsis: abdomen without transverse bands; in P. stylifera and P. coromandelice, telson with fixed lateral spines (unarmed in P. sculptilis); in P. hardwickii, telson with small movable spines and in P. acclivirostris, epipod absent on first 2 pereopods.

### SIZE:

Maximum total length: males, 11 cm; females, 17 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, from Pakistan to southeast India. Further east it extends as far as China, the Philippines, Indonesia, New Guinea and Australia.

Usually inhabits shallow waters from the coastline to about 40 m depth on sand, mud or mixed bottoms. It may also be found in deeper waters down to 90 m.

### PRESENT FISHING GROUNDS:

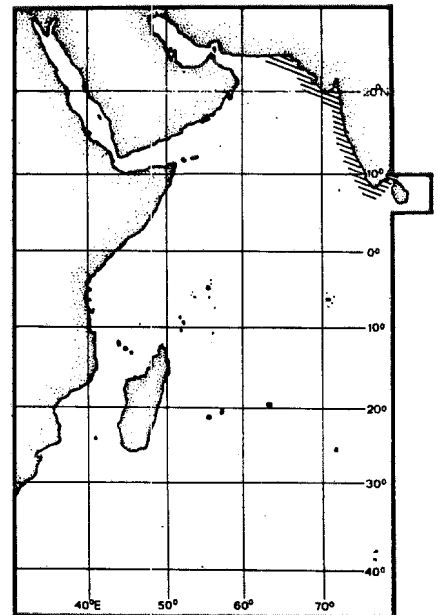
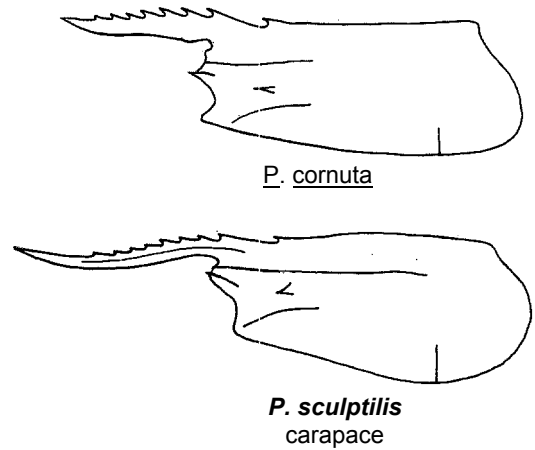
In Pakistan and along the west coast of India, there is a small fishery for the species (caught along with other shrimps); off Bombay it occurs in commercial catches and is one of the highly priced species.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mainly with stake nets and bag nets; also taken with boat seines and otter trawls.

Marketed fresh, frozen, peeled and cooked or canned; also used as shrimp meal or shrimp paste.

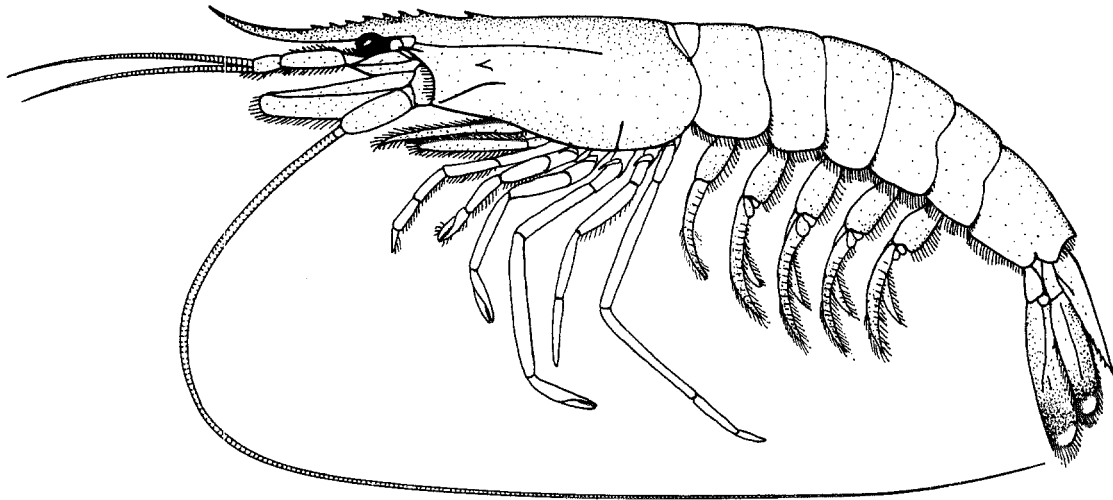


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Parapenaeopsis stylifera* (H. Milne Edwards, 1837)

OTHER SCIENTIFIC NAMES STILL IN USE: None



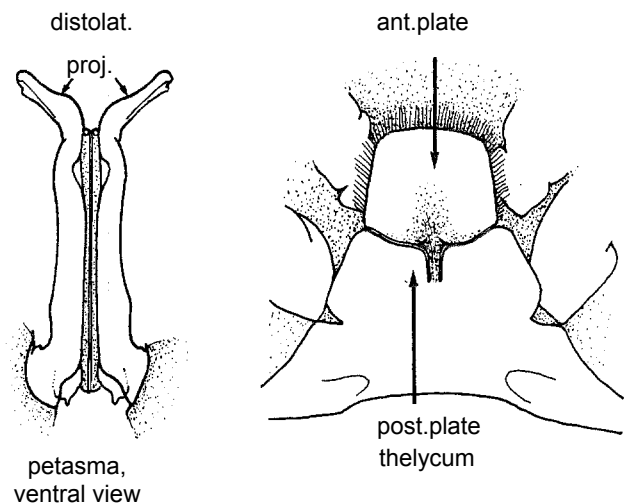
## VERNACULAR NAMES:

FAO :       En - Kiddi shrimp  
              Fr - Crevette kidi  
              Sp - Camarón kidi

NATIONAL:

## DISTINCTIVE CHARACTERS:

Rostrum sigmoid-shaped, strongly upcurved and by far overreaching tip of antennular peduncle (in males somewhat shorter), armed with 7 to 9 dorsal teeth; but toothless in distal half or more; epigastric tooth present; postrostral crest almost reaching posterior margin of carapace; longitudinal suture long, reaching 2/3 of carapace length; telson armed with 4 pairs of lateral fixed spines; antennular flagellae as long as carapace; epipod and basal spine present on first and second pereopods, basis of third pereopod unarmed. In males, distolateral projections of petasma slender, horn-like and straight, directed antero-laterally and with ventro-external openings; distomedian projections small and curved ventrally. In females, anterior plate of thelycum square, concave, with a slender stem-like posterior process; posterior plate deeply notched anteromedially.

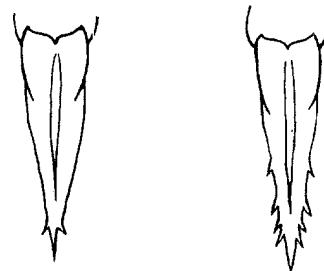


Colour: pale brownish or pinkish white, sometimes greyish; rostrum and abdominal crest darker; pereopods and pleopods yellowish pink to reddish pink; distal part of uropods dark grey, their tips distinctly white.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Parapenaeopsis coromandelica (its presence in Area 51 is restricted to Sri Lanka and southern coast of India): telson armed with 1 or 2 pairs of subapical fixed spines (4 pairs of lateral fixed spines in P. stylifera); uropods uniformly coloured (tips white in P. stylifera).

Other species of Parapenaeopsis: different configuration of petasma and thelycum; telson unarmed, or armed only with mobile spinules; rostrum toothless at most on distal half (unarmed at least on distal half in P. stylifera); furthermore, longitudinal suture reaching at most to middle of carapace in P. cornuta and P. maxillipedo; postrostral crest grooved in P. uncta, females of P. hardwickii, and often in P. sculptilis; epigastric tooth wanting in P. acclivirostris.



P. coromandelica  
telson

P. stylifera

## SIZE:

Maximum total length: males, 11.7 cm; females, 14.5 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

From the Gulf and the Gulf of Oman to south India (to about 10° north along the east coast).

Found from near the coastline to about 90 m depth, but usually in less than 50 m on mud or sandy-mud; the species completes its life cycle in the sea without entering the estuaries during any stage of its life; in south India it breeds in 20 to 22 m depth.

## PRESENT FISHING GROUNDS:

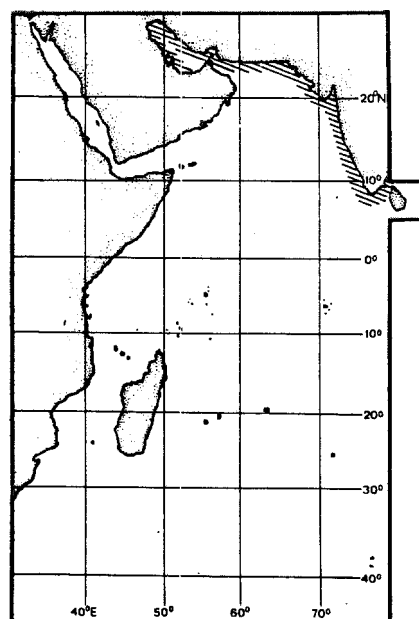
In Pakistan and all along the west coast of India, the species is very common in littoral areas and is of major commercial importance; it is also more or less commonly caught by the otter trawl fishery off Kuwait in the "Gulf".

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

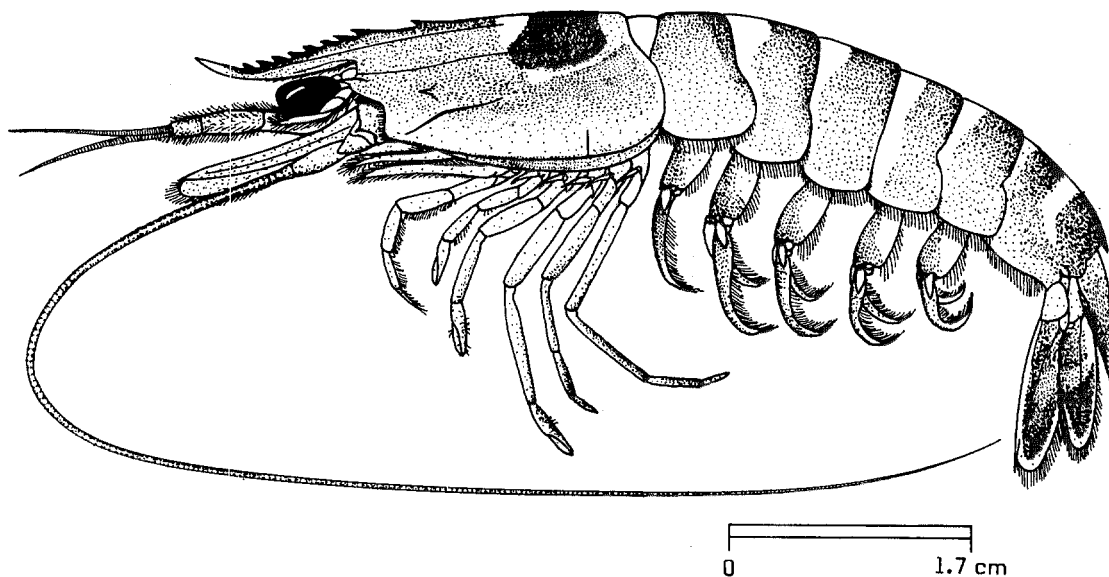
Caught with stake nets, dol nets, boat and shore seines, scoop nets, beam trawls and otter trawls.

Marketed fresh, frozen, dried, canned and as prawn meat or pulp.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Parapenaeopsis uncta* Alcock, 1905OTHER SCIENTIFIC NAMES STILL IN USE : *Parapenaeopsis probata* Hall, 1961

## VERNACULAR NAMES:

FAO : En - Uncta shrimp  
Fr - Crevette uncta  
Sp - Camarón uncta

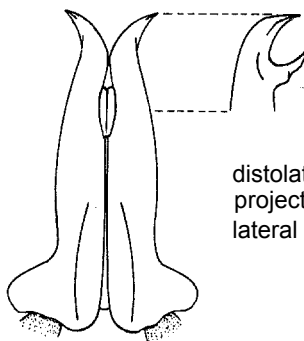
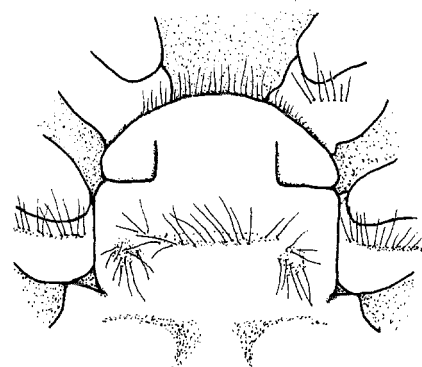
NATIONAL:

## DISTINCTIVE CHARACTERS:

Rostrum armed with 9 to 11 dorsal teeth; in females and young males sigmoid-shaped, toothless on distal 1/4 to 1/3 and styliiform, usually reaching third antennular article or beyond; in large males, straight, not reaching beyond second antennular article; epigastric tooth present, but small in males; postrostral crest grooved, almost reaching posterior margin of carapace; longitudinal suture reaching 3/4 of carapace length; telson unarmed; antennular flagella 0.45 to 0.60 times the length of carapace; epipod and basial spine present on first pereopod, both also present on second pereopod of females, but in males the basial spine is absent or very small. In males, distolateral projections of petasma simply tapering to ends, each with a long dorsomedian spine-like process; distomedian projections very small. In females, anterior plate of thelycum wide and short, with curved anterior margin and with 2 longitudinal ridges, medially fused with the quadrate posterior plate.



rostrum in large males

petasma,  
ventral viewdistolateral  
projection,  
lateral view

thelycum

Colour: brown; rostrum darker, carapace often yellowish laterally and with a large, dorsoposterior dark brown patch; abdomen with white areas making it to appear brown-banded; pereopods and pleopods yellow-red-brownish; uropods brownish proximally, blackish distally, with a white-bluish band along margins on distal half.

#### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

None of the other Parapenaeopsis species have the characteristic configuration of petasma and thelycum nor the dorso-posterior dark brown patch on carapace, typical of P. uncta. Further distinguishing characters of these species are the following:

P. hardwickii: telson armed with 3 to 5 small, mobile spines (unarmed in P. uncta); abdomen uniformly grey.

P. sculptilis: rostrum with 7 to 9 teeth (9 to 11 in P. uncta); postrostral crest feebly grooved or flat (distinctly grooved in P. uncta); abdominal bands dark, a single band present on last segment (2 bands on last segment in P. uncta).

Other species of Parapenaeopsis: postrostral crest ungrooved; abdominal bands, when present, restricted to dorsal part.

#### **SIZE:**

Maximum total length: males, 8.3 cm; females, 13 cm.

#### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, along the south coasts of India and around Sri Lanka. Further east, it extends as far as the east coast of Malaya and it is also present in south Java.

Found from 40 to 90 m depth on clean sand, sometimes mixed with shell fragments.

#### **PRESENT FISHING GROUNDS:**

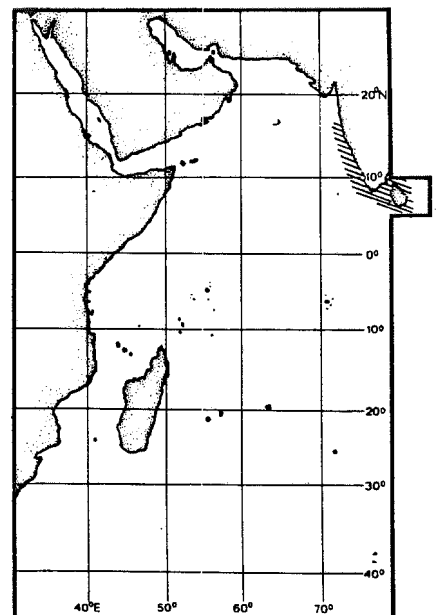
Sporadic occurrence in the landings.

#### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with otter trawls.

Marketed fresh or frozen.



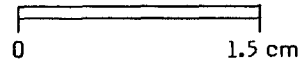
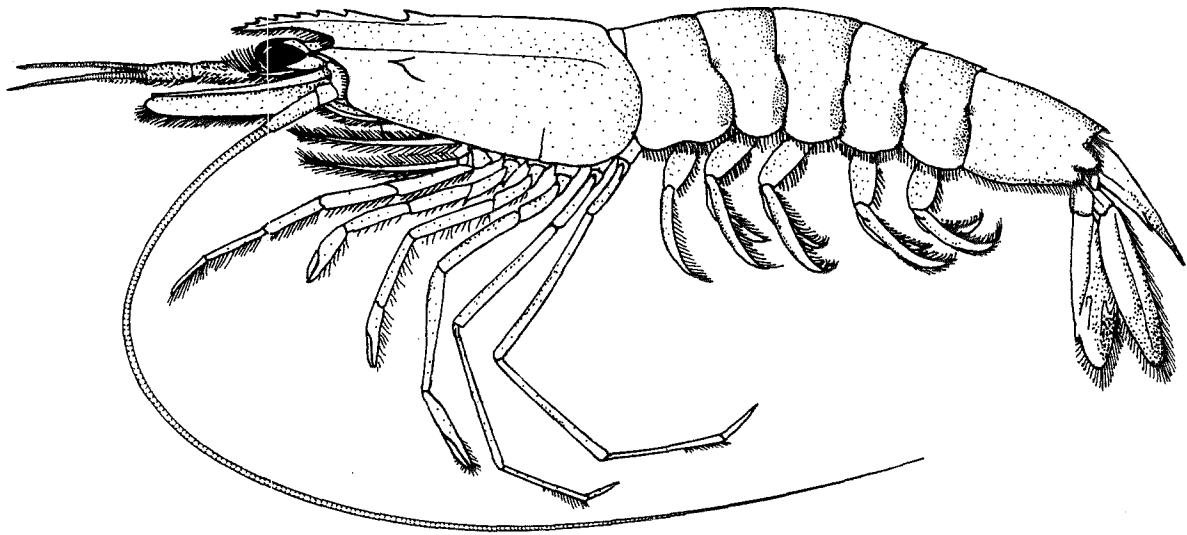
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Parapenaeus longipes* Alcock, 1905

OTHER SCIENTIFIC NAMES STILL IN USE : None



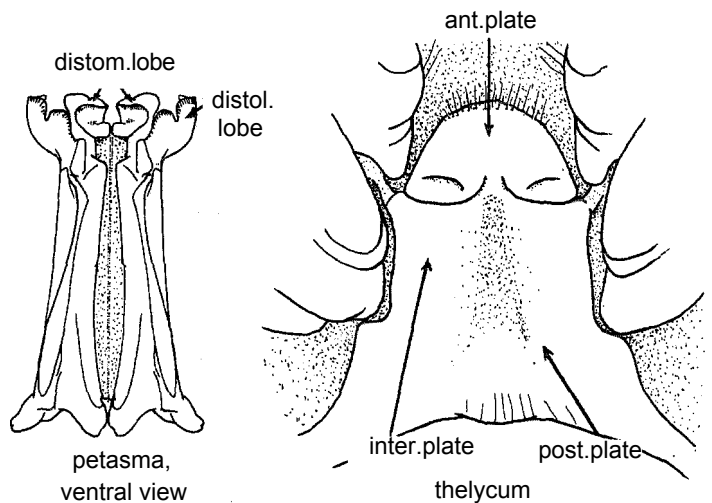
VERNACULAR NAMES:

- FAO : En - Flamingo shrimp
- Fr - Crevette flamand
- Sp - Camarón flamenco

NATIONAL:

DISTINCTIVE CHARACTERS:

Body hairless. Rostrum reaching, or exceeding distal margin of basal antennular segment, slightly curved downward and armed with 6 or 7 dorsal teeth; postrostral crest distinct; branchiostegal spine absent; no trace of hepatic crest; longitudinal and transverse sutures present, the former extending almost to posterior border of carapace; antennular flagella shorter than carapace; fifth pereopod exceeding antennal scale by length of dactyl often also by distal part of propodus. Petasma (in males) with distolateral lobes sprout-like and as long as distomedian ones. In females, anterior plate of thelycum semicircular, articulating to intermediate plate and with a median groove which continues on intermediate plate; the latter is broad, quadrate and continuous to posterior sternal plate.



Colour: pink to whitish, speckled with pink chromatophores; a red spot on disto-median part of outer uropods.



### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of *Parapenaeus*: branchiostegal spine present and situated on anterior margin of carapace or little behind it (absent in *P. longipes*); fifth pereopod not reaching tip of antennal scale (exceeding it by dactyl in *P. longipes*); different configuration of petasma and thelycum.

### SIZE:

Maximum total length: males, 7.6 cm; females, 7.9 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs along the east African coast (reported from Tanzania to Somalia) and in the northern and eastern Arabian Sea, from Pakistan to south India and off Sri Lanka. Further east, it extends as far as China, Japan and Indonesia.

A marine species found between 10 and 90 m depth.

### PRESENT FISHING GROUNDS:

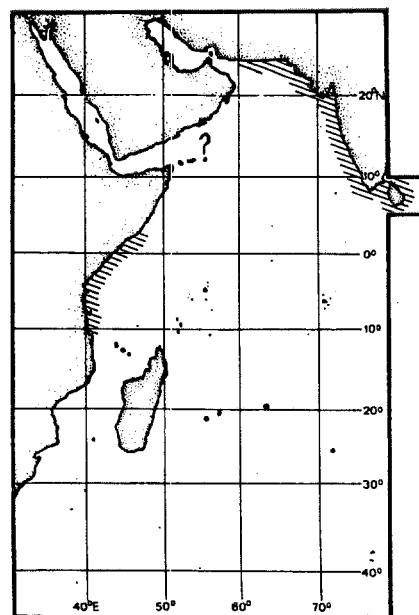
Reported in small numbers from the landings in the south-west coast of India; rare in Sri Lanka.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with otter trawls and artisanal gear.

Marketed fresh, dried or cooked.

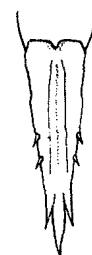
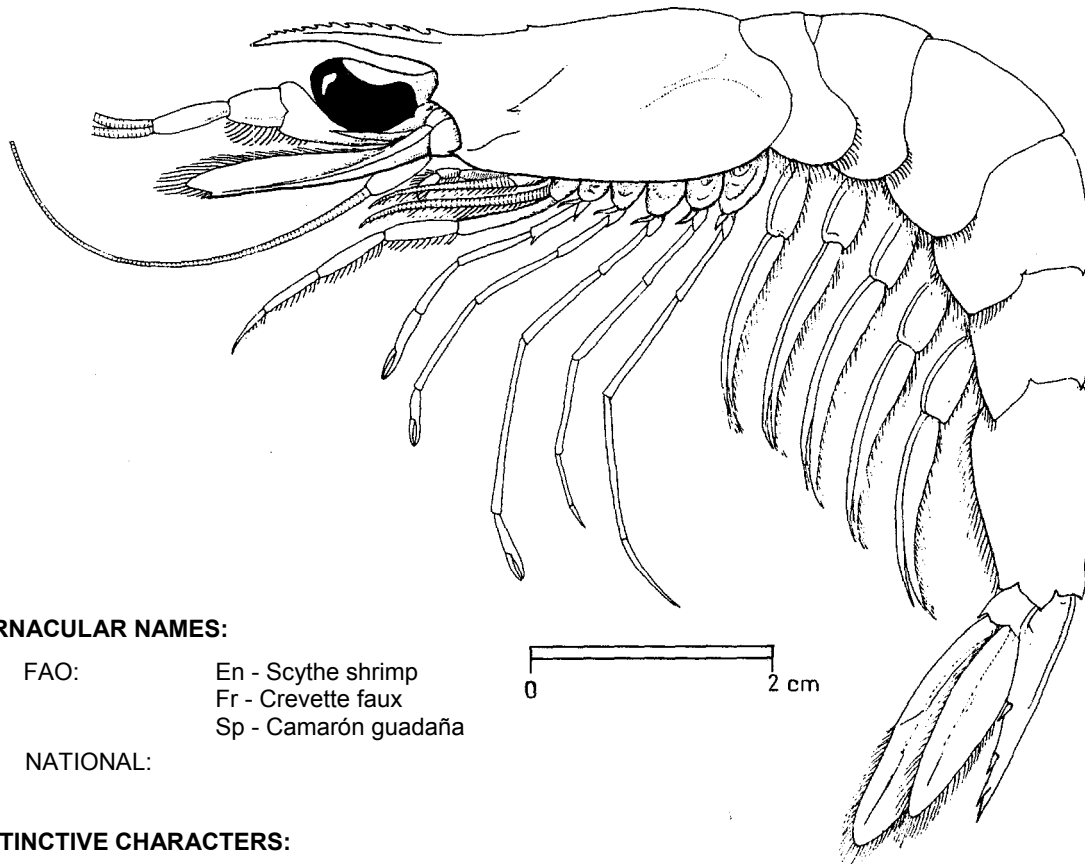


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)Penaeopsis balssi Ivanov and Hassan, 1976

## OTHER SCIENTIFIC NAMES STILL IN USE:

This species has been usually incorrectly named Penaeopsis rectacuta which does not occur in the area

telson

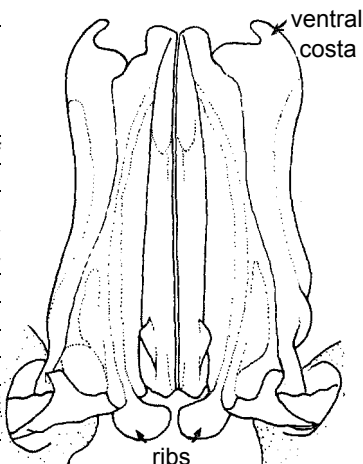
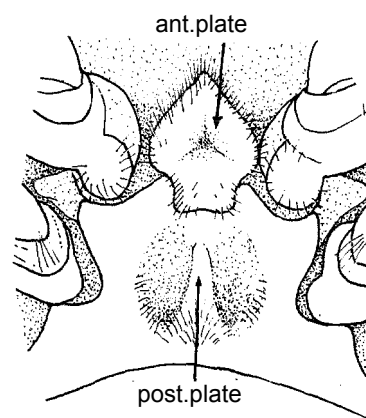
## VERNACULAR NAMES:

FAO: En - Scythe shrimp  
Fr - Crevette faux  
Sp - Camarón guadaña

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body hairless. Rostrum usually markedly curved (always strongly so in young) and short, reaching at most to midlength of second antennular segment, armed with 9 to 13 dorsal teeth; anteroventral angle of carapace obtuse; cervical and hepatic crests and grooves well defined; hepatic spine situated ventral to level of antennal spine; telson armed with a pair of long, fixed, lateral spines and 2 pairs of small, movable spines. Petasma (in males) with distal part of ventral costae curving dorsomedially and ending in conspicuous subsemicircular processes; ribs of dorsolateral lobules ending proximally in flattened, mesially directed, suboval processes. In females, anterior plate of thelycum subtriangular to orbicular; posterior plate with anterior border straight or, usually, concave on each side of postero-median projection of anterior plate; its median ridge (sometimes reduced to posterior protuberance) flanked by broad depressions.

ribs  
petasma,  
dorsal viewant.plate  
post.plate  
thelycum

Colour: frozen specimens are red to pinkish.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Penaeopsis jerryi: rostrum longer and almost horizontal, straight or slightly sinuous (short and usually markedly curved in P. balssi); telson with 3 pairs of small movable spines (only 2 pairs in P. balssi).

Other deep-water penaeids: asymmetrical petasma in males, third maxilliped with a basal spine (Metapenaeopsis); carapace with longitudinal and transverse sutures (Parapenaeus) or with lateral keels (Funchalia); rostrum with dorsal and ventral teeth (Penaeus).

### SIZE:

Maximum total length: males, 12.8 cm; females, 15 cm.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Along the African coast from Somalia to Natal, and also off Madagascar.

Found at depths between 280 and 980 m, mainly on soft sand and mud.

### PRESENT FISHING GROUNDS:

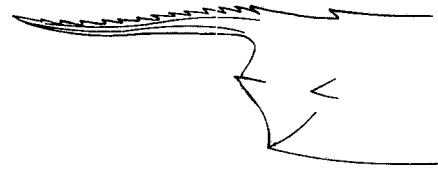
Off Kenya (Malindi to Ras Ngomeni), the species is fished along with Heterocarpus woodmasoni in 300 to 360 m depth; off Mozambique (Sofala Bank) it is fished along with Haliporoides triarthrus in depths of 500 to 550 m.:

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

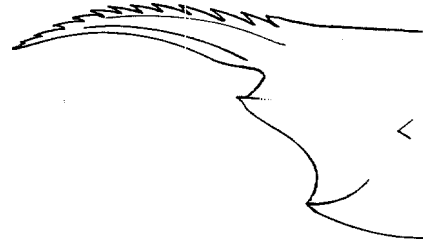
Separate statistics are not reported for this species.

Caught with bottom trawls.

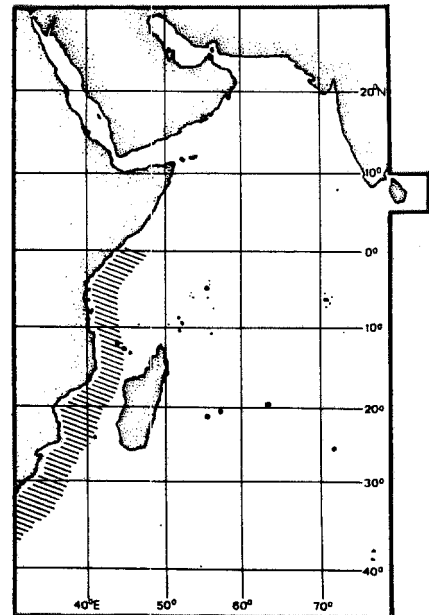
Marketed frozen.



P. jerryi



P. balssi  
rostrum

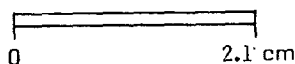
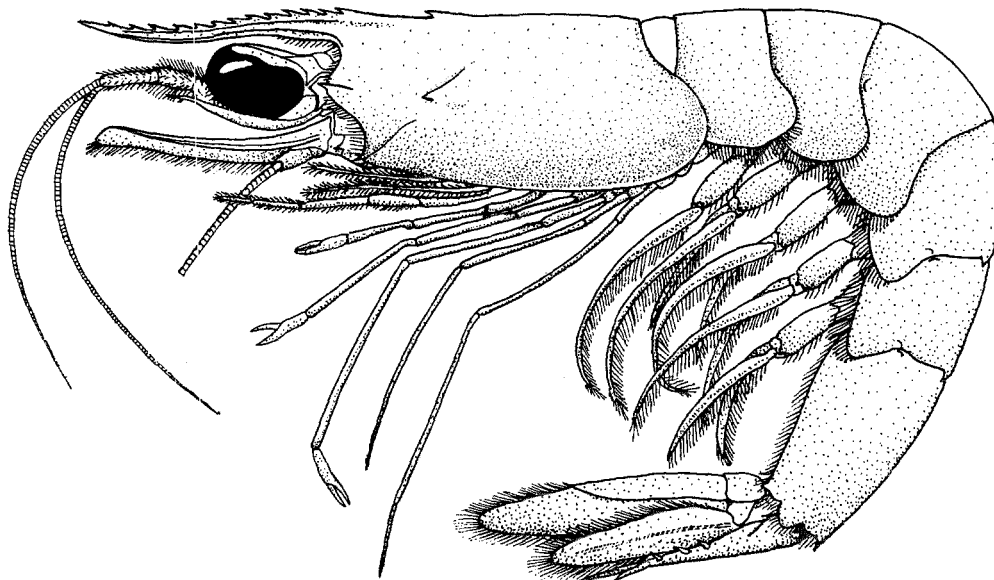


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Penaeopsis jerryi* Pérez Farfante, 1979

## OTHER SCIENTIFIC NAMES STILL IN USE:

This species has been incorrectly named *Penaeopsis rectacuta* which does not occur in the areaventral  
costa

## VERNACULAR NAMES:

FAO : En - Gondwana shrimp  
Fr - Crevette gondwana  
Sp - Camarón gondwana

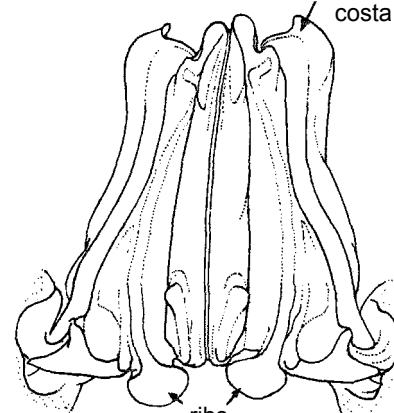
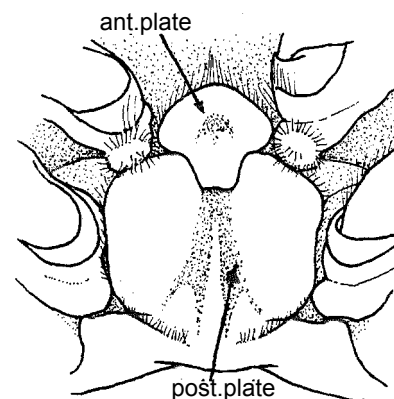
NATIONAL:

## DISTINCTIVE CHARACTERS:

Body hairless. Rostrum almost horizontal, straight or slightly sinuous (occasionally convex basally, straight anteriorly) and long, almost reaching to, or exceeding, distal margin of antennular peduncle, armed with 12 to 16 dorsal teeth; anteroventral angle of carapace almost rectangular; cervical and hepatic crests and grooves well defined; hepatic spine situated at about same level as antennal spine; telson armed with a pair of fixed lateral spines and 3 pairs of small, movable spines. Petasma (in males with distal part of ventral costae curving abruptly dorsomedially and ending in short, relatively narrow processes; ribs of dorsolateral lobules terminating proximally in semicircular or subcircular processes. In females, anterior plate of thelycum subsemicircular to trilobed; posterior plate with anterior border broadly arched on each side of posteromedian projection of anterior plate, and strongly inclined posterolaterally, its median ridge sometimes reduced to a posterior tubercle.



telson

ribs  
petasma,  
dorsal view

post.plate

thelycum

Colour: red or dark brown with a reddish tint.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Penaeopsis balssi: rostrum shorter and usually strongly curved long and straight or slightly sinuous in P. jerryi); telson with 2 pairs of small movable spines (3 pairs in P. jerryi).

Other deep-water penaeids: asymmetrical petasma in males, third maxilliped with a basal spine (Metapenaeopsis); carapace with longitudinal and transverse sutures (Parapenaeus) or with lateral keels (Funchalia); rostrum with dorsal and ventral teeth (Penaeus).

**SIZE:**

Maximum total length: males, 10.7 cm; females, 13.8 (16?) cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

From southwest India (off Cochin) to the Gulf of Aden (off Berbera) and along the African coast southward to Mozambique; also off Madagascar. Outside the area, known from the east coast of India (off Madras) and in the Andaman Sea.

Found at depths between 180 and 680 m, mainly on soft bottoms.

**PRESENT FISHING GROUNDS:**

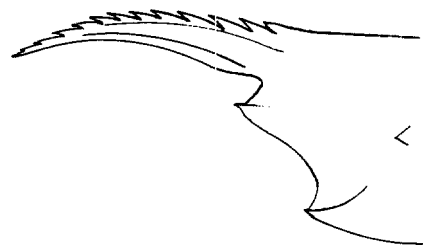
Of potential commercial importance off the Kerala coast in south India where it has been experimentally taken in sizeable quantities between 180 and 360 m depth; also caught off Madagascar.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

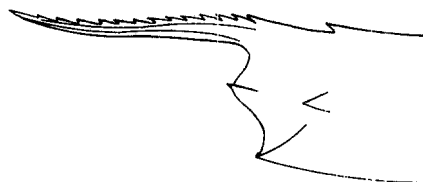
Separate statistics are not reported for this species.

Caught with bottom trawls.

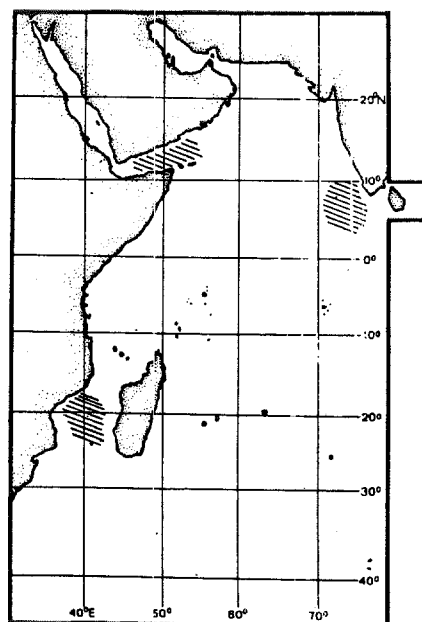
Marketed frozen.



P. balssi



**P. jerryi**  
rostrum

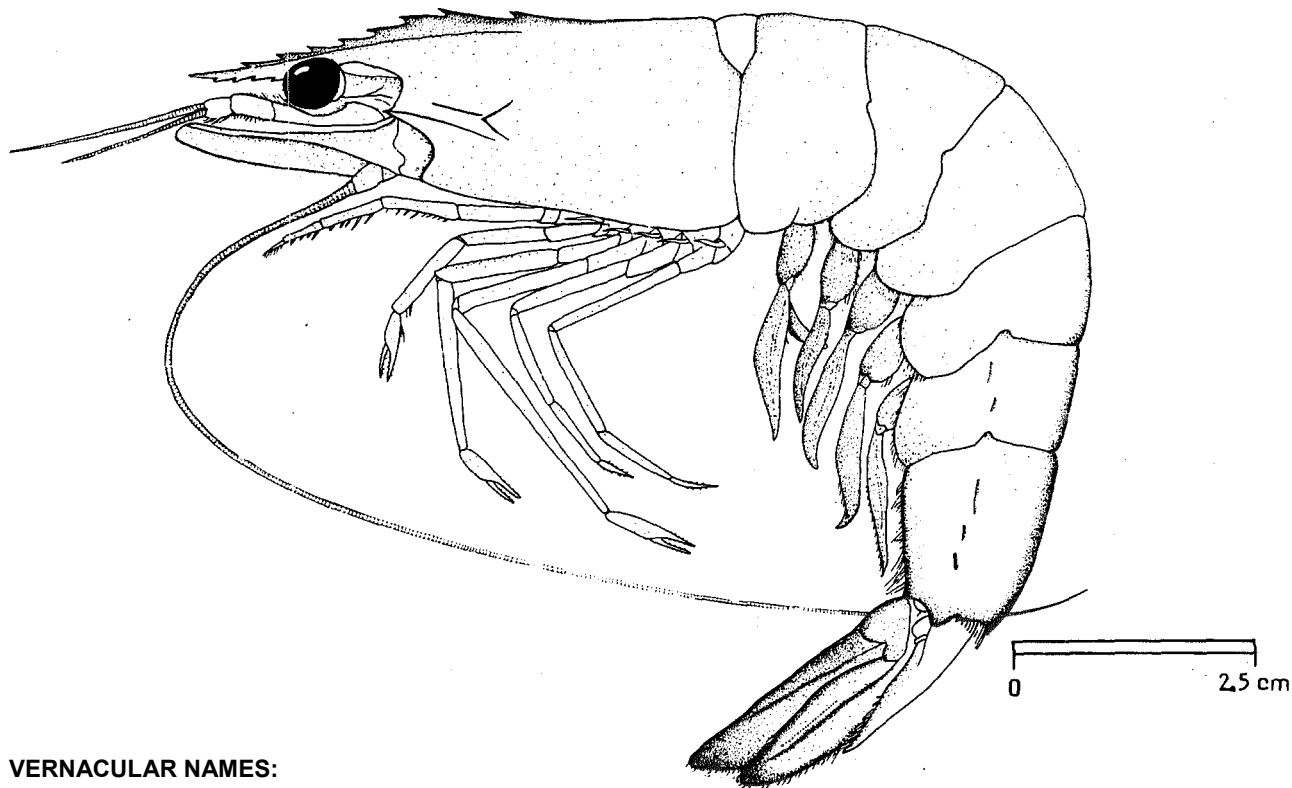


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Penaeus (Fenneropenaeus) indicus* H. Milne Edwards, 1837

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Indian white shrimp  
Fr - Crevette royale blanche (des Indes)  
Sp - Camarón blanco de la India

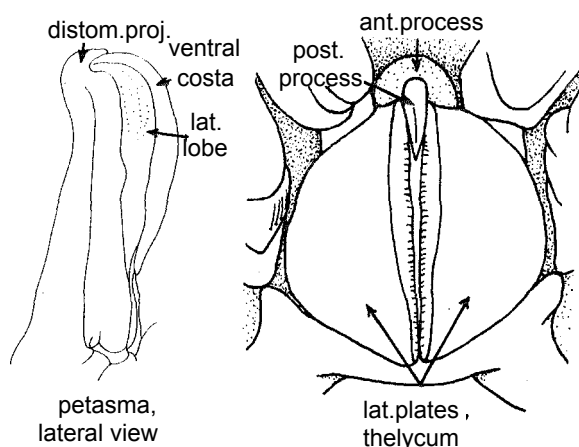
NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace hairless. Rostrum slender and long, with 7 to 9 teeth on dorsal, and 4 to 6 teeth on ventral margin; blade of rostrum becoming moderately high in large specimens; adrostral crest and groove extending as far as, or just beyond epigastric tooth, the groove shallow; post-rostral crest ending distinctly before posterior margin of carapace; gastrofrontal and hepatic crests absent; gastro-orbital crest extending over posterior 2/3 of distance between hepatic spine and orbital margin; in adult males dactyl of third maxilliped about as long as propodus (0.85 to 1.0 times).

Petasma in males with distomedian projections overhanging distal margin of costae; ventral costae unarmed; outer surface of lateral lobes with a few rows of minute tubercles. Thelycum (in females) with lateral plates, their median margins forming tumid lips beset with papillae on their inner surface; anterior process rounded distally; posterior process ill-calcified, almost completely inserted between lateral plates.

Colour: body pale pink to yellowish, semi-translucent, with olive-green to grey-blue speckles; rostral and middorsal abdominal crests mostly brown, but reddish at base; pereopods generally of same colour as body; pleopods pink or red; distal part of uropods green or red, fringe of setae usually red. Juveniles are whitish, with specks of same colour as adults; rostral crest semi-translucent; pleopods whitish.

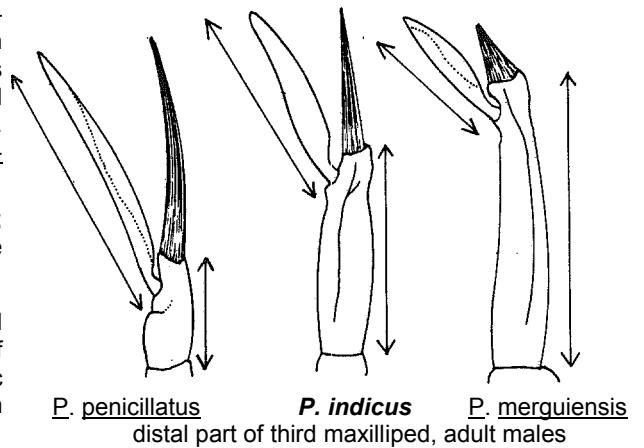


## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Penaeus merguensis and P. penicillatus: gastro-orbital crest ending at posterior third of distance between orbital margin and hepatic spine (reaching posteriorly as far as hepatic spine in P. indicus); dactyl of third maxilliped in adult males half the length of propodus in P. merguensis and much longer than propodus in P. penicillatus (as long as propodus in P. indicus).

Penaeus (Penaeus) species: hepatic crest present; presence of dark, generally brown or black, transverse bands on abdominal segments.

Other species of Penaeus: adrostral crest and groove long, extending almost to posterior margin of carapace (extending as far as, or just beyond, epigastric tooth in P. indicus); gastrofrontal crest present (absent in P. indicus); distal part of uropods generally blue.



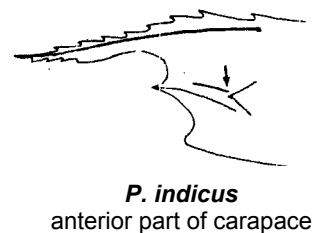
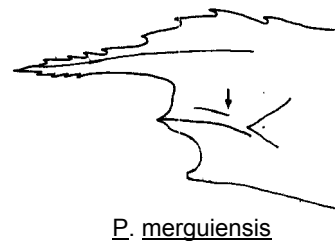
## SIZE:

Maximum total length:    males, 18.4 cm;    females, 23 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, from south and east African coast, to India and Sri Lanka including Madagascar and the Red Sea, but possibly absent or very rare in the Gulf of Oman and the "Gulf". Further east it extends to south China, the Philippines and northern Australia.

Inhabits shelf areas from the coastline to depths of about 90 m; most abundant in shallow waters in less than 30 m on sand or mud (slight preference for sandy bottoms); a very euryhaline species since in the Red Sea it tolerates salinities of more than 45‰; caught by day as well as at night.



## PRESENT FISHING GROUNDS:

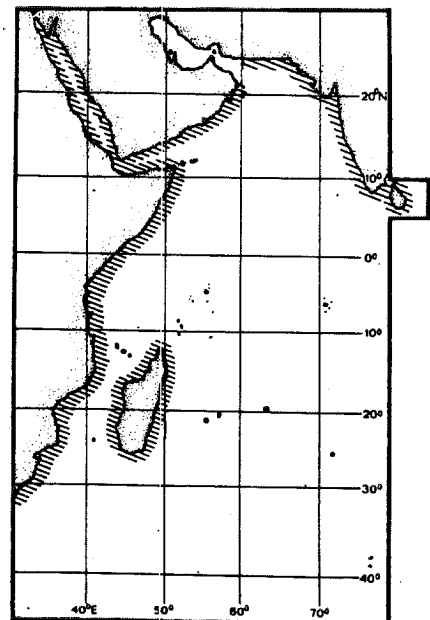
Along the east African coast (Mozambique, Tanzania, Kenya and Somalia), the fishery for this species is of major importance, the species being dominant in the shrimp catches; in India it is one of the most abundant, and at the same time, is among the most highly priced shrimp; also abundant in Sri Lanka but not so from the Gulf of Aden to Pakistan; juveniles contribute to a good fishery in estuarine regions. It is cultivated in India.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species by FAO.

Caught with otter trawls, drift nets, set gill nets, stake nets, push nets and cast nets are also used for the capture of juveniles.

Marketed mainly fresh and frozen; also canned and dried; juveniles are used in shrimp paste.



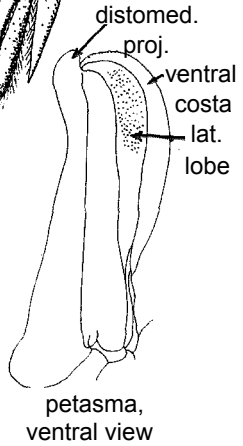
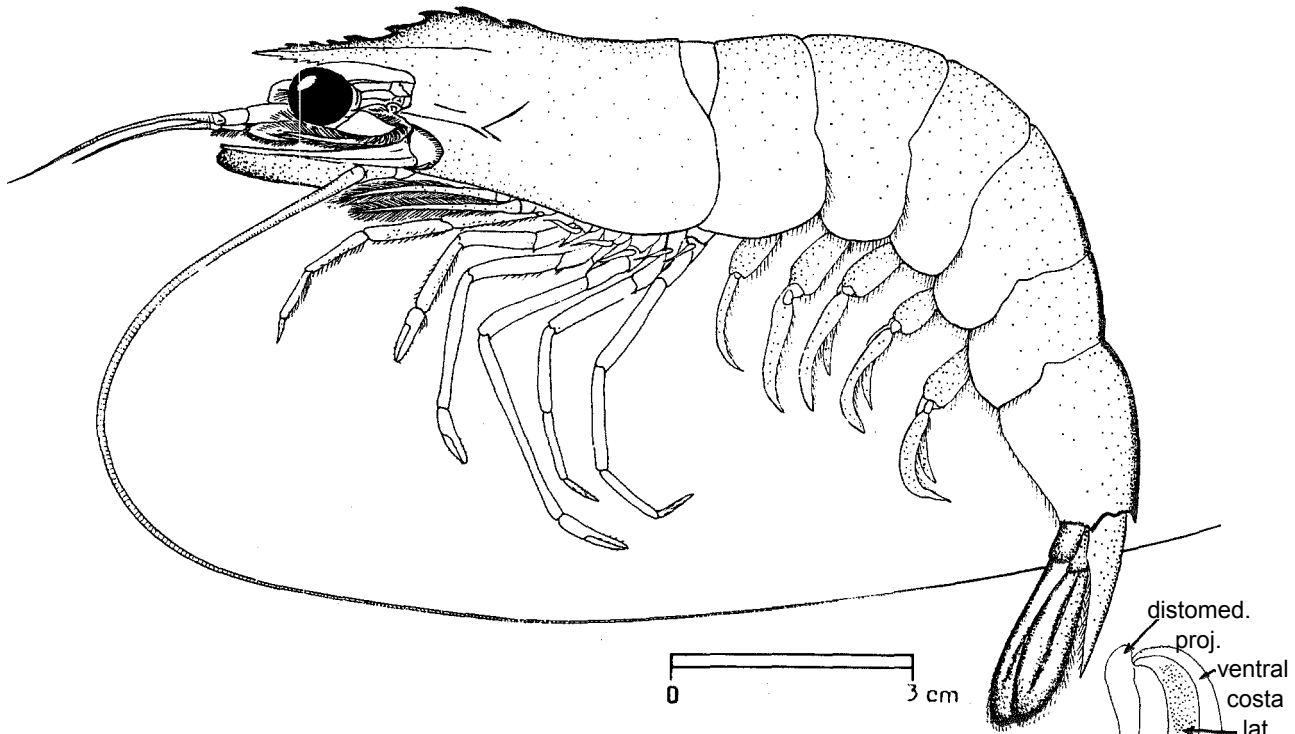
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Penaeus (fenneropenaeus) merquiensis* De Man, 1888

OTHER SCIENTIFIC NAMES STILL IN USE: None



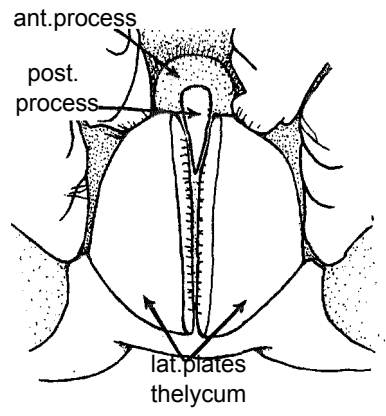
VERNACULAR NAMES:

- FAO: En - Banana shrimp
- Fr - Crevette banane
- Sp - Camarón banana

NATIONAL:

DISTINCTIVE CHARACTERS :

Carapace smooth. Rostrum armed with 6 to 9 teeth on dorsal, and 3 to 6 on ventral margin; blade of rostrum high, broadly triangular in shape; adrostral crest and groove not reaching as far as epigastric tooth, the groove shallow; postrostral crest ending distinctly before posterior margin of carapace; gastrofrontal and hepatic crests absent; gastro-orbital crest extending over middle third to half of distance between hepatic spine and orbital margin; in adult males, dactyl of third maxilliped half (0.5 to 0.6 times as long as propodus). Petasma in males with distomedian projections overhanging distal margin of costae; free border of ventral costae serrate near apex; outer surface of lateral lobes with several rows of minute tubercles. Thelycum (in females) with lateral plates, their median margins forming tumid lips beset with papillae on their inner surface; anterior process slightly concave, rounded distally; posterior process ill-calciated, almost completely inserted between lateral plates.



Colour: body pinkish to pale yellow, sometimes green-greyish, with green-grey to grey-blue speckles; rostral and middorsal abdominal crests brown-red, sometimes grey; pereopods of same colour as body; pleopods yellow-pink to red; distal part of uropods green or red, fringe of setae red. Juveniles are whitish, with specks of same colour as adults; rostral crest translucent; pleopods whitish; distal half of uropods translucent, their tips red.



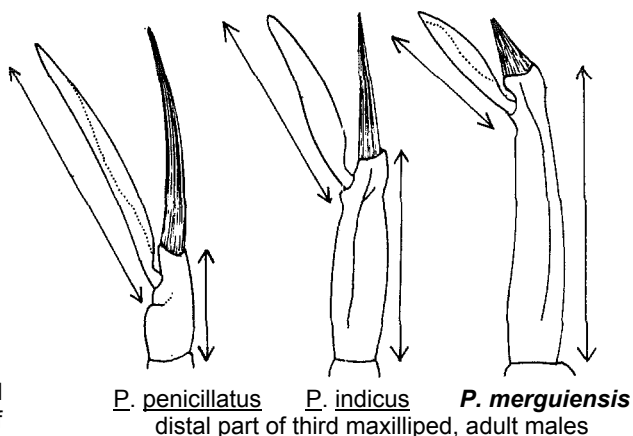
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Penaeus penicillatus: dactyl of third maxilliped in adult males much longer than propodus (half as long as propodus in P. merguensis); adrostral crest extending just beyond epigastric tooth (not reaching as far as epigastric tooth in P. merguensis).

P. indicus: gastro-orbital crest reaching posteriorly as far as hepatic spine (never reaching it in P. merguensis); dactyl of third maxilliped as long as propodus in adult males.

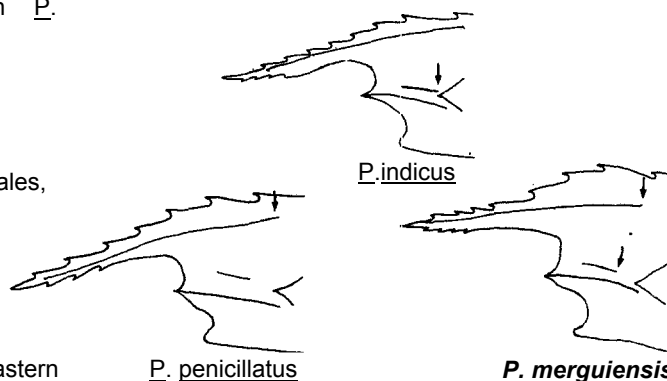
Penaeus (Penaeus) species: hepatic crest present; presence of dark, generally brown or black, transverse bands on abdominal segments.

Other species of Penaeus: adrostral crest and groove long, extending almost to posterior margin of carapace; gastrofrontal crest present (absent in P. merguensis); distal part of uropods generally blue.



## SIZE:

Maximum total length: males, 19.5 cm; females, 24 cm.



## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, along the northern and eastern coasts of the Arabian Sea, from the Gulf of Oman and Hormoz Strait to south India and Sri Lanka. Further east, it extends as far as south China, the Philippines, Australia and New Caledonia.

Inhabits shelf areas from the coastline to depths of about 55 m, but is most abundant in shallow waters of less than 20 m depth, on mud or sandy-mud; prefers turbid waters (this is not a burrowing species) and forms large shoals when the density of the population is high; caught by day as well as at night.

## PRESENT FISHING GROUNDS:

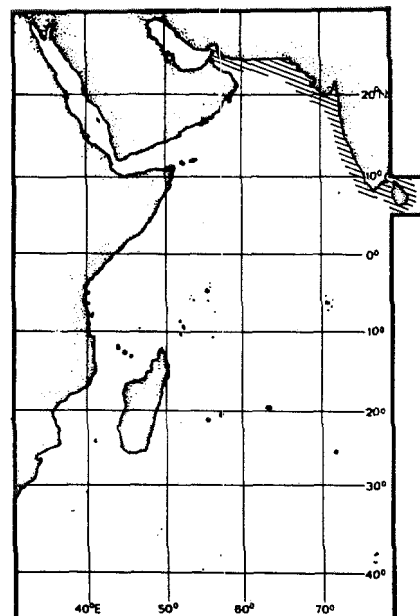
In Pakistan it is commercially very important and, together with P. penicillatus, outnumbers all the other species in catches from coastal waters; it also contributes to the commercial fishery along the central west coast of India and is abundant in Sri Lanka; juveniles are fished in estuarine regions.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION

Separate statistics are not reported for this species by FAO in Fishing Area 51.

Caught mainly with otter trawls, shrimp drift nets and set gill nets; also fished with stake nets, boat and shore seines; juveniles are also caught with scoop nets, drag nets, push nets and cast nets.

Marketed mainly fresh and frozen; also canned and fried; juveniles are used in shrimp paste or as shrimp meal.



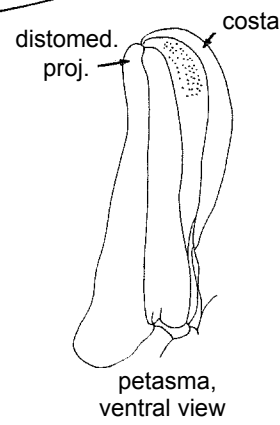
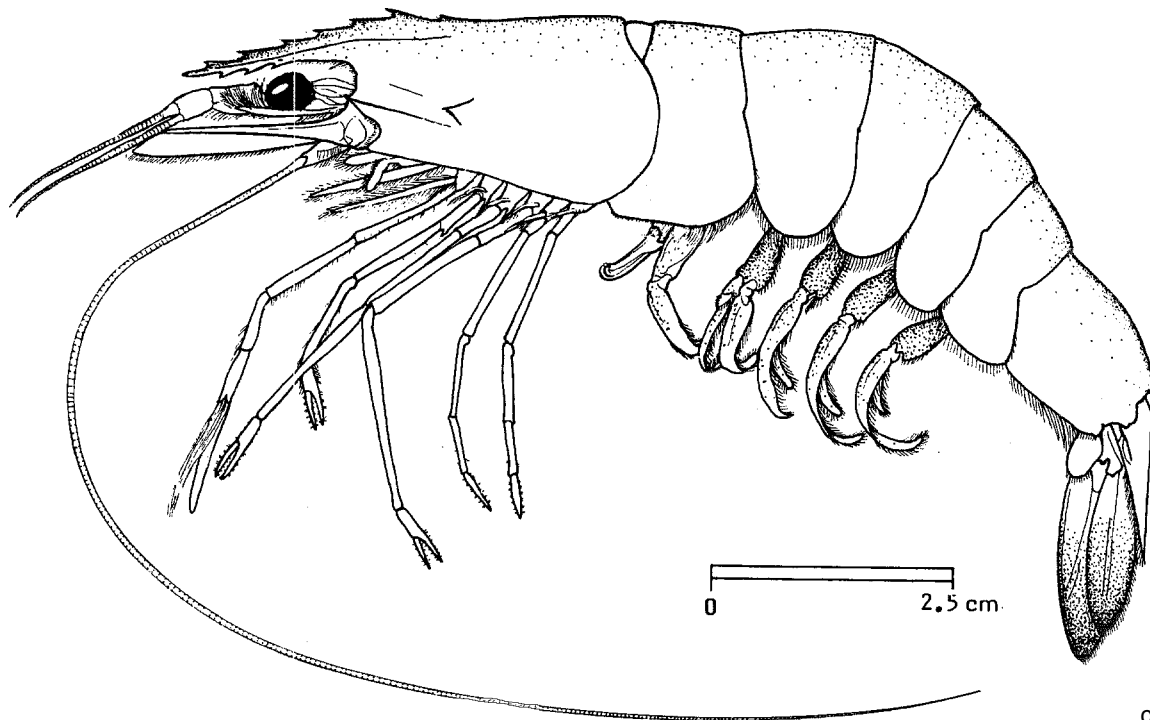
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

*Penaeus (Fenneropenaeus) penicillatus* Alcock, 1905

FISHING AREA 51  
(W. Indian Ocean)

OTHER SCIENTIFIC NAMES STILL IN USE: None



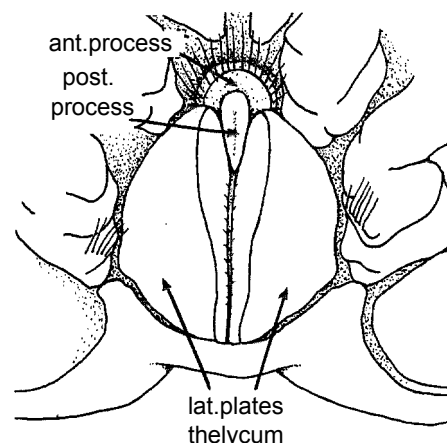
VERNACULAR NAMES:

- FAO : En - Redtail prawn
- Fr - Crevette queue rouge
- Sp - Camarón colorado

NATIONAL:

DISTINCTIVE CHARACTERS:

Carapace smooth. Rostrum armed with 7 to 9 teeth on dorsal, and 3 to 5 teeth on ventral margin; blade of rostrum convex, becoming relatively high in large specimens; adrostral crest and groove extending just beyond epigastric tooth, the groove shallow; postrostral crest ending distinctly before posterior margin of carapace; gastrofrontal and hepatic crests absent; gastro-orbital crest extending over middle third of distance between hepatic spine and orbital margin; in adult males dactyl of third maxilliped much longer than propodus (1.5 to 2.7 times). Petasma (in males) with very short distomedian projections, generally not reaching distal margin of costae. Thelycum in females with lateral plates, their median margin forming tumid lips; anterior process slightly concave, rounded distally; posterior process ill-calcified, almost completely inserted between lateral plates.



Colour: body white to yellow pinkish, sometimes pink; rostral and middorsal abdominal crests generally brown to red; pereopods of same colour as body; pleopods red or pink; distal part of uropods green or red, fringe of setae red. Juveniles are whitish, with olive-green or brown specks; rostral crest translucent; distal half of uropods green-translucent, with red hair fringe.

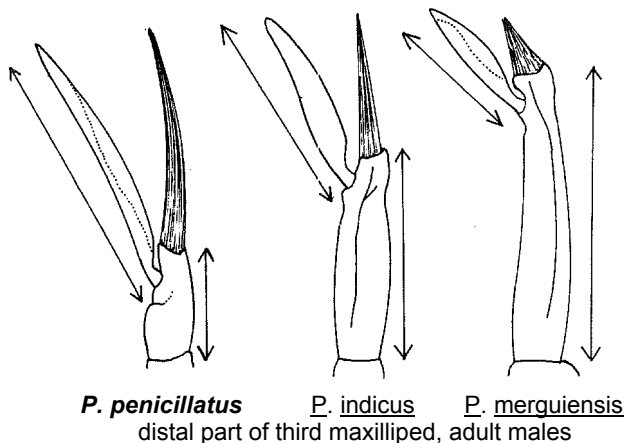
#### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Penaeus merguensis: dactyl of third maxilliped in adult males half the length of propodus (much longer than propodus in P. penicillatus); adrostral crest not reaching as far as epi-gastric tooth (extending just beyond epigastric tooth in P. penicillatus).

P. indicus: gastro-orbital crest reaching, posteriorly as far as hepatic spine (ending at posterior third of distance between orbital margin and hepatic spine in P. penicillatus); in adult male, dactyl of third maxilliped as long as propodus.

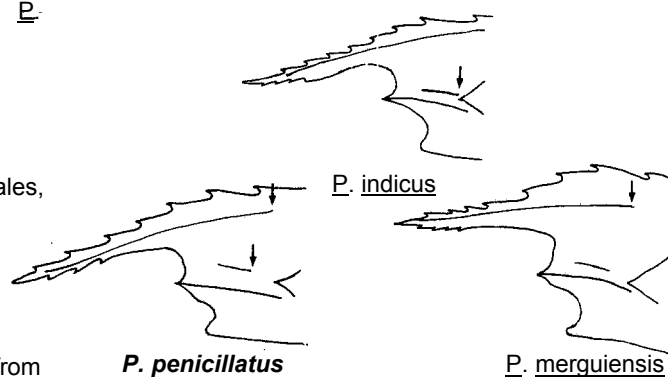
Penaeus (Penaeus) species: hepatic crest present; presence of dark, generally brown or black, transverse bands on abdominal segments.

Other species of Penaeus: adrostral crest and groove long, extending almost to posterior margin of carapace; gastrofrontal crest present (absent in P. penicillatus); distal part of uropods generally blue.



#### SIZE:

Maximum total length: males, 16.3 cm; females, 21.2 cm.



#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, in the north-east Arabian Sea from Pakistan to Maharashtra, India. Also present from the east coast of India to Indonesia, China and Taiwan Island.

Found from the coastline to depths of about 90 m on mud and sand, but it is most abundant in shallow waters near to the shore; caught by day and at night.

#### PRESENT FISHING GROUNDS:

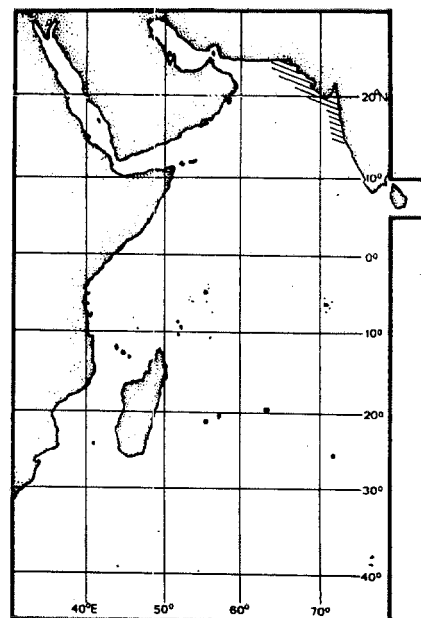
In east Pakistan (off Karachi and the Sind coast) it is very abundant and of major commercial importance; also fished off Bombay in small quantities.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species by FAO.

Adults are mainly caught with shrimp trawls and seines; juveniles and subadults are taken in inshore waters with scoop nets and other artisanal gear.

Marketed mostly fresh and frozen; juveniles are also dried.



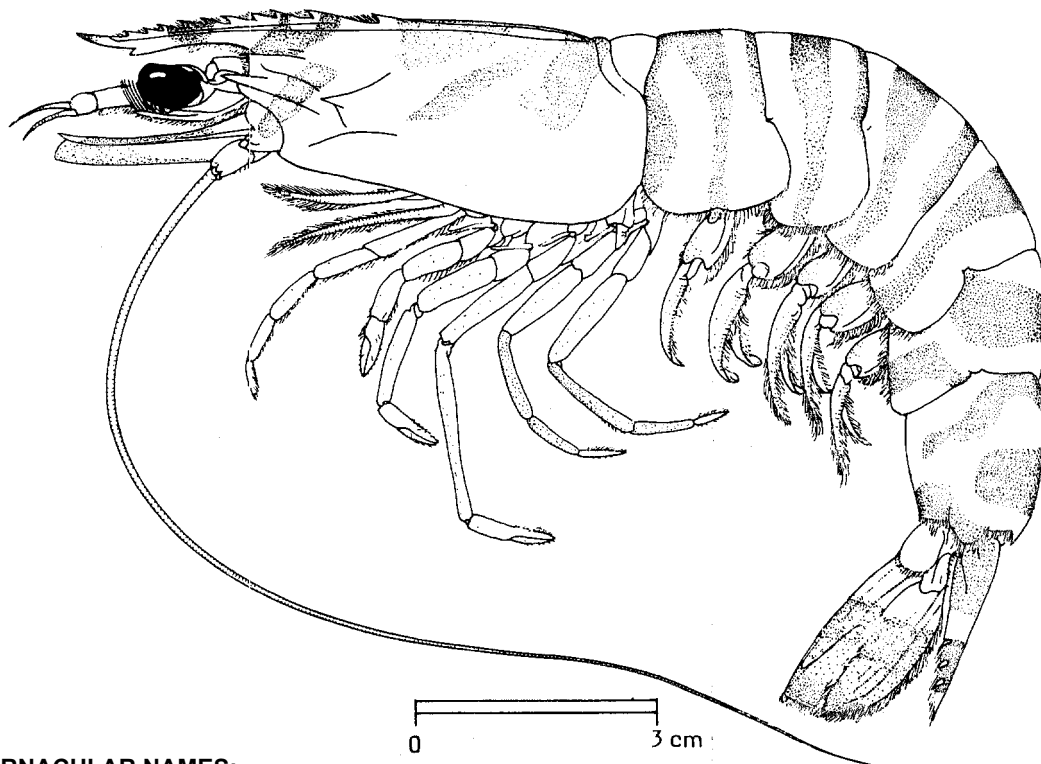
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

<i>Penaeus</i> ( <i>Marsupenaeus</i> ) <i>japonicus</i> Bate, 1888
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OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

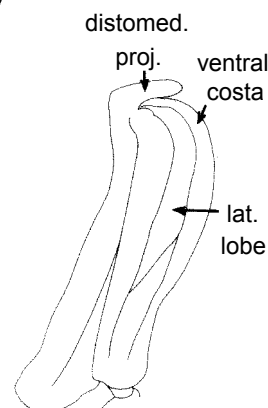
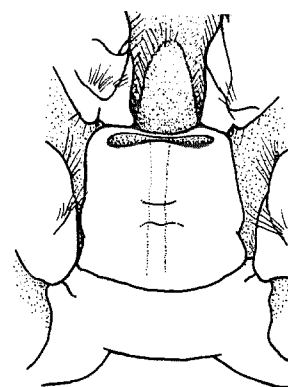
FAO :           En - Kuruma shrimp  
                  Fr - Crevette kuruma  
                  Sp - Camarón kuruma

NATIONAL:

## DISTINCTIVE CHARACTERS:

Carapace smooth. Rostrum armed with 9 to 11 teeth on dorsal, and a single tooth on ventral margin, with an accessory crest on the blade; adrostral crest and groove long, extending almost to posterior margin of carapace, the groove wide; postrostral crest well developed as far back as adrostral groove, with a deep median groove throughout its length; gastrofrontal crest present; gastrofrontal groove bifurcate posteriorly; hepatic crest almost horizontal to base of antennal crest and from there sloping anteroventrally; telson armed with 3 pairs of movable spines; no ischial spine on first pereopod. Petasma (in males) with long distomedian projections distinctly overhanging distal margins of costae, tips enlarged; ventral costae slightly broadened apically and unarmed; outer surface of lateral lobes not tuberculate. Thelycum (in females) without lateral plates but with a pouch widely open anteriorly; anterior and posterior processes forming a triangular, concave plate.

Colour: body pale yellow to pink with red-brown to dark brown transverse bands; rostrum banded; carapace with anterolateral and dorsal patches (the latter circular in dorsal view and 2 bands, the anterior one at middle of carapace and leaning anteroventrally; last abdominal band discontinuous; pereopods yellow proximally, blue or bluish distally, their basal part white; pleopods yellow, tips bluish, white spots at bases; uropods with a large brown median transverse band, proximally white-creamish, distally yellow, tip blue and fringe of setae red.

petasma,  
ventral view

thelycum

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Penaeus canaliculatus: telson unarmed (armed with lateral movable spines in P. japonicus); last abdominal band reaching the ventral margin (discontinuous in P. japonicus); a different pattern of bands on carapace and different configuration of petasma and thelycum.

P. latisulcatus: carapace and abdomen not banded dorsally; different configuration of petasma and thelycum.

Other species of Penaeus: adrostral crest and groove ending distinctly before posterior margin of carapace (almost reaching it in P. japonicus); gastrofrontal crest absent (present in P. japonicus).

## SIZE:

Maximum total length: males, 20 cm; females, 23.5 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, from south and east Africa to India, including the Red Sea, the "Gulf"; Madagascar, Mauritius and La Réunion. Further east it extends as far as Korea and Japan, New Guinea, Fiji and Australia; the species has also entered the eastern Mediterranean through the Suez Canal.

Inhabits shelf areas from the coastline to depths of about 90 m but is most abundant in less than 50 m on sandy bottoms; the adults are predominantly active at night, burying in the substrate in daytime.

## PRESENT FISHING GROUNDS:

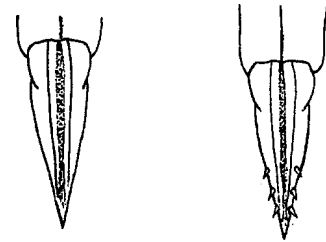
In Madagascar and on the east coast of Africa from South Africa to the Gulf of Aden and the Red Sea the species is fished, but is of minor commercial importance; it is rather common in Pakistan, but in west India it is only found in small numbers near Bombay; of sporadic occurrence in the "Gulf":

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

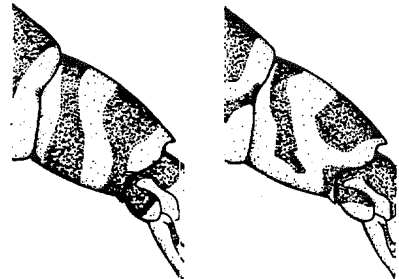
Separate statistics are not reported by FAO for this species in Fishing Area 51.

Caught mainly with otter trawls, drift nets and set gill nets; also taken by stake traps.

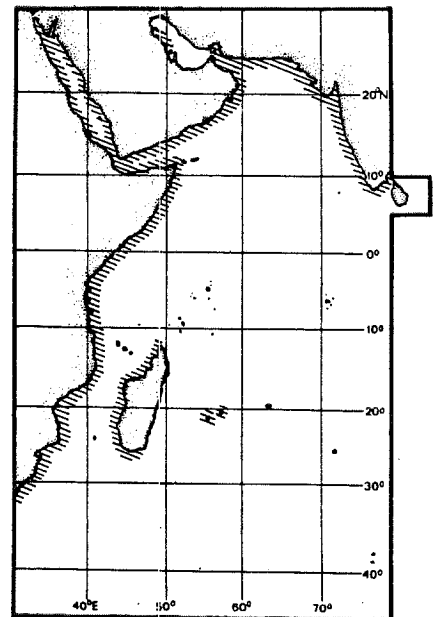
Marketed mostly fresh and frozen.



P. canaliculatus      *P. japonicus*  
telson



P. canaliculatus      *P. japonicus*  
last abdominal segment



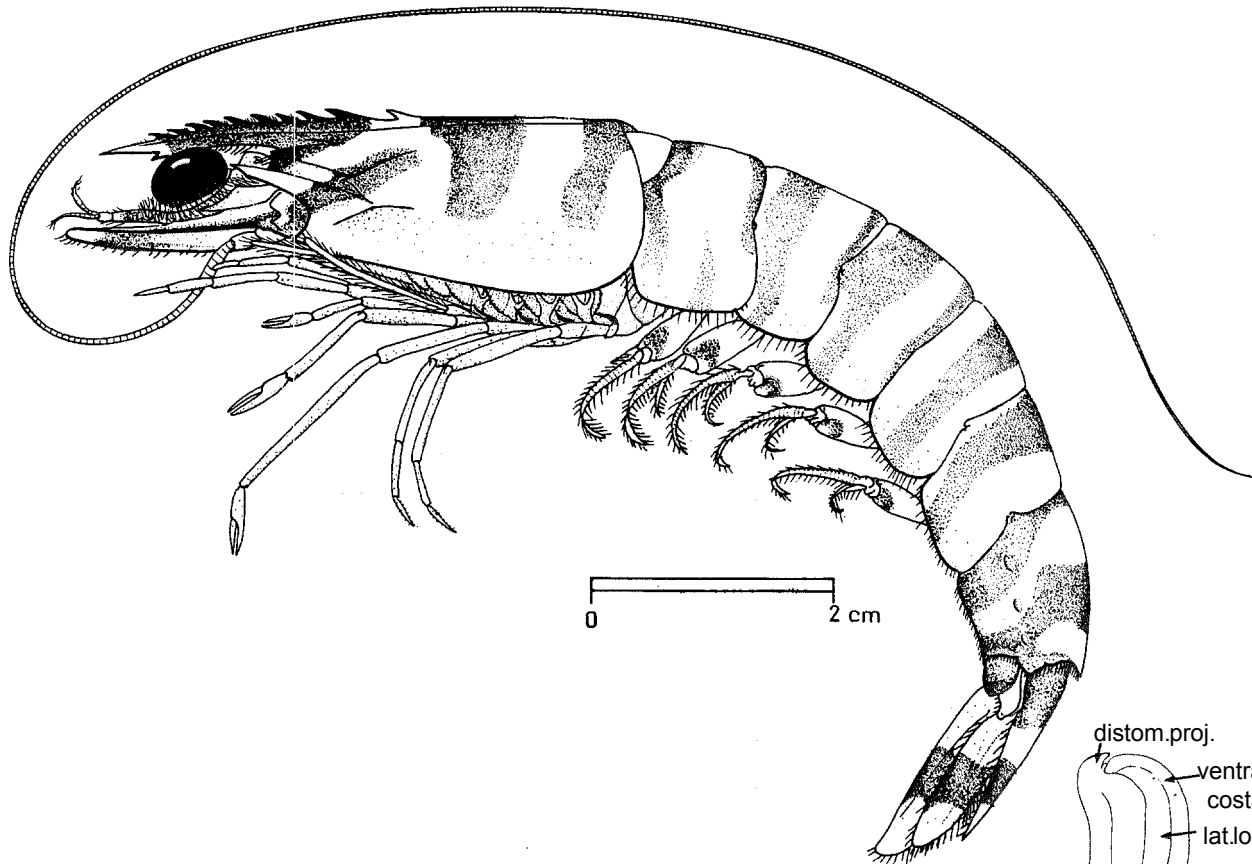
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Penaeus (Melicertus) canaliculatus* (Olivier, 1811)

OTHER SCIENTIFIC NAMES STILL IN USE: None



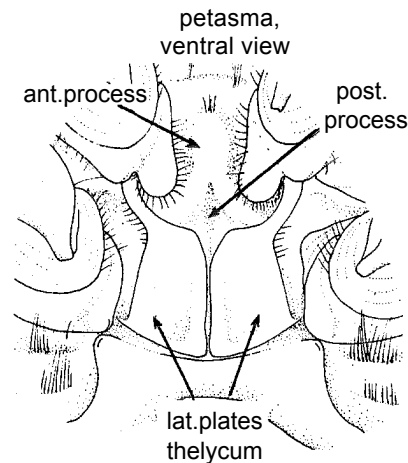
VERNACULAR NAMES:

FAO : En - Witch prawn  
 Fr - Crevette sorcière  
 Sp - Camarón brujo

NATIONAL

DISTINCTIVE CHARACTERS :

Carapace smooth. Rostrum armed with 9 to 11 teeth on dorsal, and a single tooth on ventral margin; adrostral crest and groove long, extending almost to posterior margin of carapace, the groove wide; postrostral crest well developed as far back as adrostral groove, with a deep median groove throughout its length; gastrofrontal crest present; gastrofrontal groove bifurcate posteriorly; hepatic crest almost horizontal to base of antennal crest and from there sloping anteroventrally; telson lacking lateral spines; no ischial spine on first pereopod. Petasma (in males) with short distomedian projections, reaching or slightly overhanging distal margin of costae; ventral costae broadened apically and bearing minute spinules at tip; outer surface of lateral lobes not tuberculate. Thelycum (in females) with lateral plates, their anteromedian margins diverging, then turning in a broad arc continuous with anterolateral margins; anterior process subacuminate or subovate; posterior process triangular, anterior edges raised in lateral ridges delimiting a median depressed area.



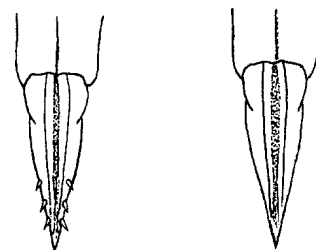
Colour: body pale yellow with red-brown to brown transverse bands; rostrum brown, tip cream-coloured; carapace with 2 dorsal bands perpendicular to axis of body and a third one leaning anteroventrally and reaching anterior margin of carapace; last abdominal band reaching ventral margin; pereopods yellow, tips bluish or pinkish; pleopods yellow with brown and white spots at bases; uropods with a large brown median transverse band, proximally white-creamish, distally yellow, tips blue and fringe of setae red.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

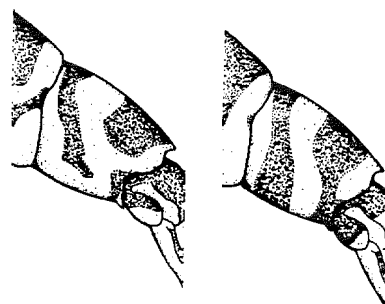
Penaeus japonicus: telson armed with lateral movable spines unarmed in P. canaliculatus; last abdominal band discontinuous (continuous and reaching ventral margin in P. canaliculatus); a different pattern of bands on carapace and different configuration of petasma and thelycum.

P. latisulcatus: carapace and abdomen not banded dorsally; telson armed with lateral movable spines; differences in configuration of petasma and thelycum.

Other species of Penaeus: adrostral crest and groove ending distinctly before posterior margin of carapace (almost reaching it in P. canaliculatus); gastrofrontal crest absent (present in P. canaliculatus).



P. japonicus      P. canaliculatus  
telson



P. japonicus      P. canaliculatus  
last abdominal segment

**SIZE:**

Maximum total length:    males, 14.5 cm;    females, 18.2 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, it occurs from south and east Africa to India, including the Red Sea, Mauritius, La Reunion and Sri Lanka. Further east, it extends as far as Taiwan Island, New Guinea and Polynesia.

Found from the coastline to depths of about 50 m; juveniles inhabit estuaries and backwaters.

**PRESENT FISHING GROUNDS:**

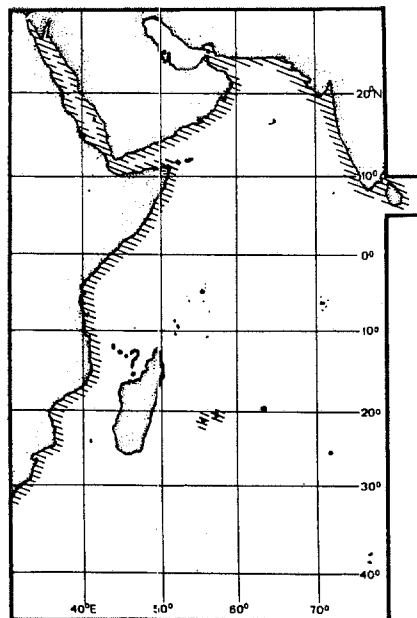
In the south-west coast of India, the species contributes to catches from creeks and backwaters; in Sri Lanka it is not abundant; likely to be fished in other localities.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught mainly with stake nets and bag nets; probably also fished with otter trawls and shrimp gill nets.

Marketed fresh, dried or canned.

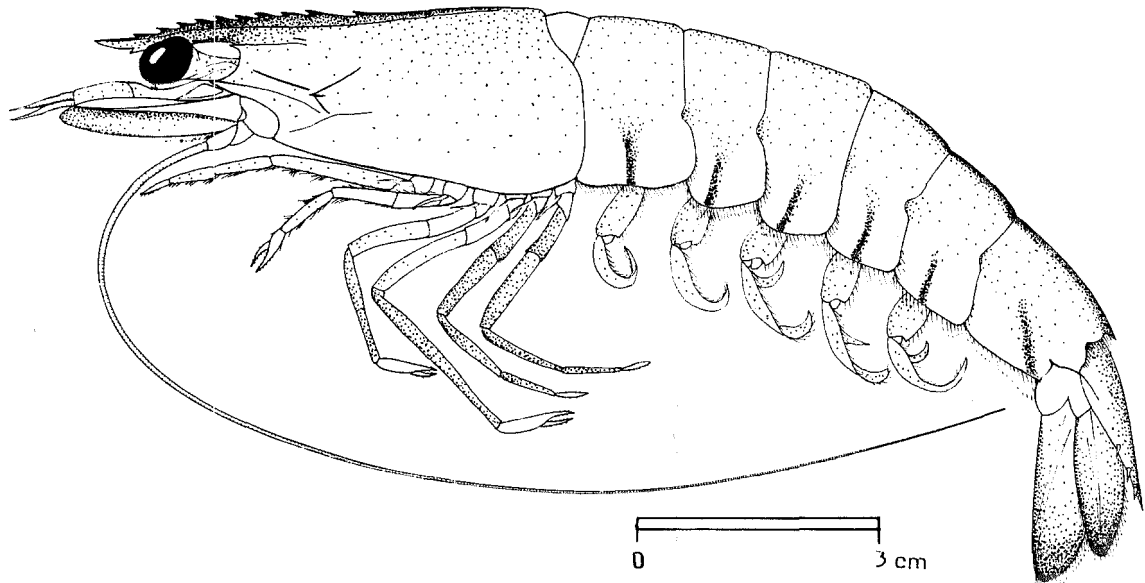


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

Penaeus (Melicertus) latisulcatus Kishinouye, 1896FISHING AREA 51  
(W. Indian Ocean)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Western king prawn  
Fr - Crevette royale occidentale  
Sp - Camarón real

NATIONAL:

## DISTINCTIVE CHARACTERS:

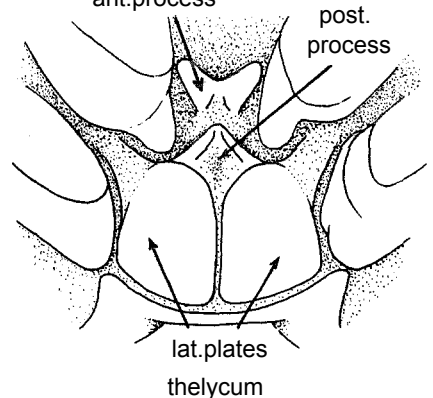
Carapace smooth. Rostrum with 9 to 12 teeth on dorsal, and a single tooth on ventral margin, sometimes with a feeble accessory crest on the blade; adrostral crest and groove long, extending almost to posterior margin of carapace, the groove wide; postrostral crest well developed as far back as adrostral groove, with a deep median groove throughout its length; gastrofrontal crest present; gastrofrontal groove bifurcate posteriorly; hepatic crest almost horizontal to base of antennal crest and from there sloping anteroventrally; telson armed with 3 pairs of movable spines; no ischial spine on first pereopod. Petasma (in males) with distomedian projections reaching to or slightly overhanging distal margins of costae; ventral costae largely broadened apically, unarmed on their free border but incised on their attached border; outer surface of lateral lobes not tuberculate. Thelycum (in females) with lateral plates, their antero-median angles divergent; anterior process with anterolateral edges raised, forming 2 subtriangular or cylindrical projections; posterior process triangular, its anterior edges raised in lateral ridges delimiting a median depressed area.

distom.proj.      ventral  
costa  
lat.lobe



petasma,  
ventral view

ant.process      post.  
process





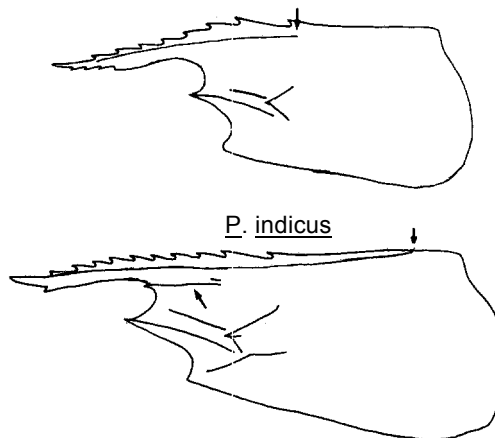
Colour: body pale yellow to brown; antennal, rostral, postrostral and middorsal abdominal crests dark brown; pleura of first 5 abdominal segments each with a short vertical red or brown stripe; a diagonal stripe of the same colour may be present on last segment; pereopods yellow or blue; pleopods generally yellow; distal part of uropods blue with a fringe of red setae.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Penaeus marginatus: postrostral crest not grooved (grooved in P. latisulcatus); ischial spine present on first pereopod (absent in P. latisulcatus); adults in deep water, at 200 to 300 m depth.

P. canaliculatus and P. japonicus: carapace and abdomen dorsally banded; telson unarmed in P. canaliculatus (armed with movable spines in P. latisulcatus); different configuration of petasma and thelycum in P. japonicus.

Other species in Penaeus; adrostral crest and groove ending distinctly before posterior margin of carapace (almost reaching it in P. latisulcatus); gastrofrontal crest absent (present in P. latisulcatus).



**P. latisulcatus**  
carapace

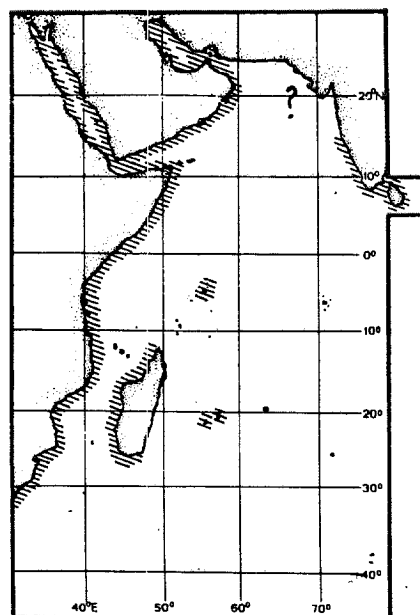
**SIZE:**

Maximum total length: males, 16.2 cm; females, 20.2 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, it occurs from south-east Africa to the Gulf of Oman and the "Gulf", the Red Sea, Madagascar, Mauritius, La Reunion and Seychelles. Also present along the southern coast of India and Sri Lanka. Further east it extends from Burma to Korea and Japan, New Guinea, Australia and Fiji.

Found from the coastline to depths of about 80 m, occasionally in deeper waters, on sand or mud, but with a clear preference in many localities for sandy substrates; the species is nocturnal, burying in the seabed in daytime and emerging at night to feed.



**PRESENT FISHING GROUNDS:**

Of minor commercial importance along the African coast (Mozambique to Somalia and the Gulf of Aden); in the Red Sea it is one of the most important species in the catches and in the "Gulf" it is caught in small quantities; in south India and Sri Lanka it is rather rare.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species by FAO in Fishing Area 51.

Caught mainly with otter trawls; also taken in small numbers with barrier traps and other artisanal gear.

Marketed mostly fresh and frozen.

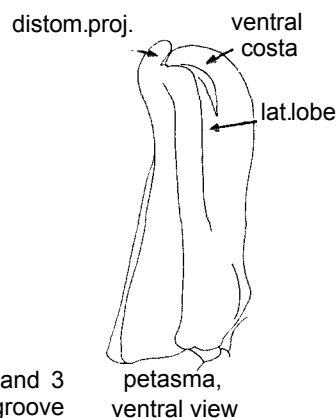
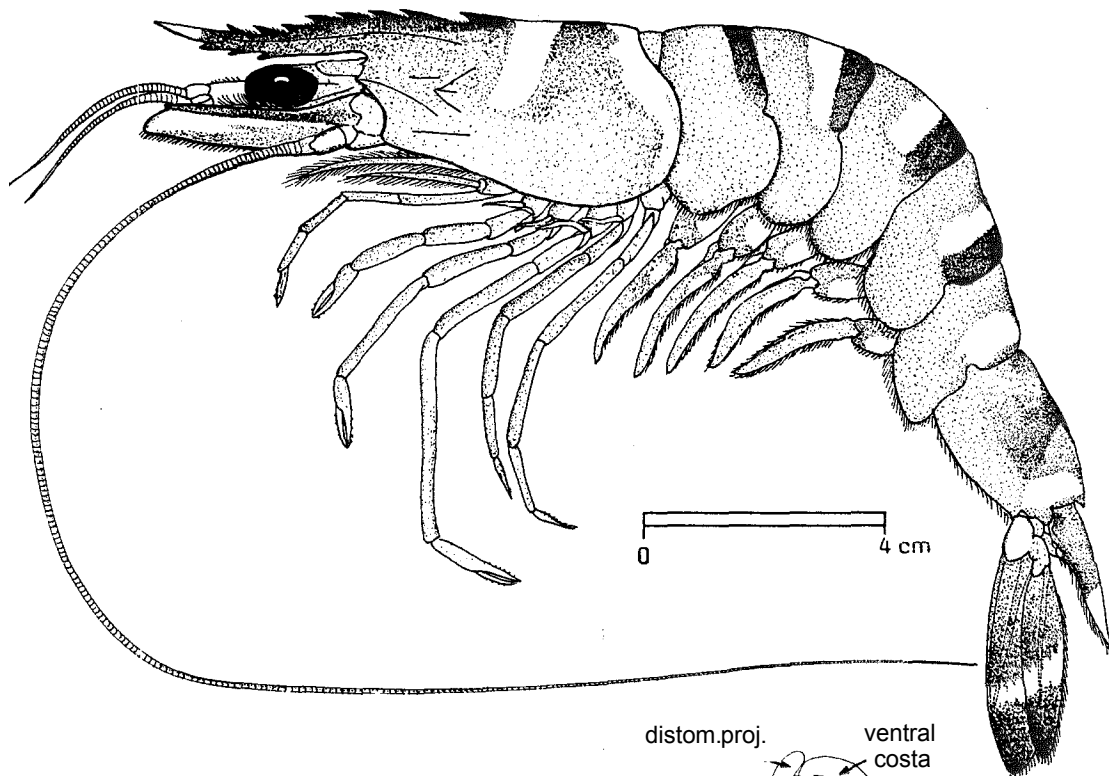
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)

Penaeus (Penaeus) monodon Fabricius, 1798

OTHER SCIENTIFIC NAMES STILL IN USE: Penaeus bubulus Kubo, 1949



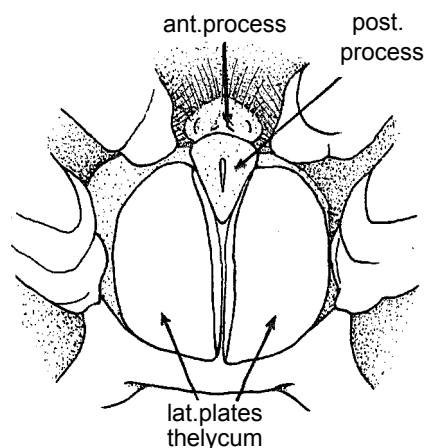
VERNACULAR NAMES:

- FAO : En - Giant tiger prawn
- Fr - Crevette géante tigrée
- Sp - Camarón tigre gigante

NATIONAL:

DISTINCTIVE CHARACTERS:

Carapace smooth. Nostrum armed with 7 or 8 teeth on dorsal, and 3 or 4 (rarely 2) teeth on ventral margin; adrostral crest and groove extending as far as, or slightly ahead, of epigastric tooth; postrostral crest well developed, almost reaching posterior margin of carapace, with or without a feeble median groove; gastrofrontal crest absent; antennal crest very prominent, ending above middle of hepatic crest; gastro-orbital crest extending over posterior half, or less, of distance between hepatic spine and orbital margin; hepatic crest straight, almost horizontal, distinctly separated from base of antennal crest; fifth pereopod without exopod. Petasma (in males) with distomedian projections slightly overhanging distal margin of costae; ventral costae generally unarmed, sometimes minutely serrate at tip; outer surface of lateral lobes generally unarmed; inner surface of lateral lobes armed with spinules. Thelycum (in females) with lateral plates, their median margin sometimes forming tumid lips; anterior process concave, rounded distally; posterior process subtriangular, partly inserted between thelycal plates.



Colour: body green-grey to brown, sometimes reddish or bluish; dorsoposterior margin of carapace generally cream-yellow, often a transverse band of the same colour near middle of carapace; abdomen with dark brown to dark grey and pale yellow dorsal transverse bands (exceptionally absent); antennae uniform pink-brown; pereopods and pleopods of same colour as body or darker, with cream-coloured spots; uropods brown, green-grey or bluish, with a pale yellow to pink median transverse band. Juveniles are pale green, with dark transverse bands on first, third and last abdominal segments.

#### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Penaeus semisulcatus: adrostral crest and groove extending well beyond epigastric tooth (reaching at most as far as epigastric tooth in P. monodon); hepatic crest sloping antero-ventrally (horizontal in P. monodon); fifth pereopod with exopod (without exopod in P. monodon); also differences in colouration.

Penaeus (Fenneropenaeus) species: hepatic crest absent; body white to pinkish, never banded.

Other species of Penaeus: adrostral crest and groove long, extending almost to posterior margin of carapace; gastro-frontal crest present (absent in P. monodon); distal part of uropods generally blue.

#### SIZE:

Maximum total length: males, 26.8 cm; females, 33.7 cm; this is the largest penaeid species known.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, from south and east Africa to the Gulf of Aden and the Red Sea, the west coast of Madagascar, Mauritius and La Réunion; also present from Pakistan to south India and Sri Lanka. To the east it extends as far as China and Japan, the Philippines, New Guinea and Australia.

Found from the coastline to depths of about 150 m, occasionally in deeper waters; the largest concentrations are fished in less than 60 m on mud or sand, sometimes mixed with shell fragments; juveniles are found in mangrove swamps, estuaries or backwaters; the species is more easily available at night.

#### PRESENT FISHING GROUNDS:

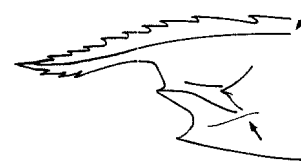
In east Africa (Mozambique to Somalia) and Madagascar it is one of the main species and is of medium commercial importance; in the Red Sea and Pakistan it is sporadically caught by trawlers; also fished in relatively small quantities in India and Sri Lanka.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

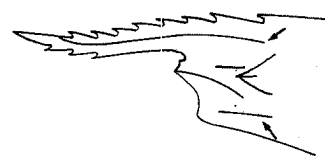
Separate statistics are not reported for this species by FAO in Fishing Area 51.

Caught with otter trawls, shrimp gill nets, boat and shore seines, stake nets and traps; juveniles are also fished with cast nets, drag nets and push nets.

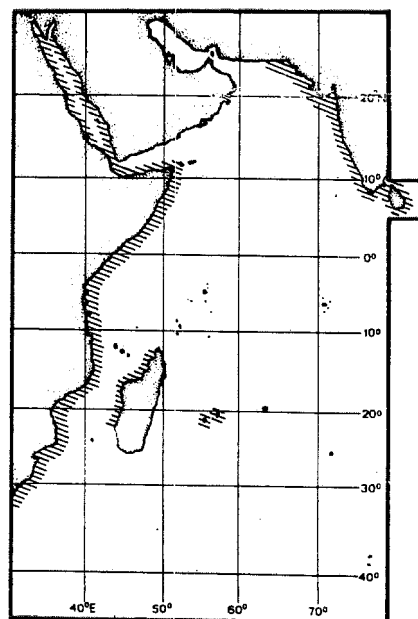
Marketed mostly fresh and frozen, sometimes dried.



P. semisulcatus



P. monodon  
anterior part of carapace



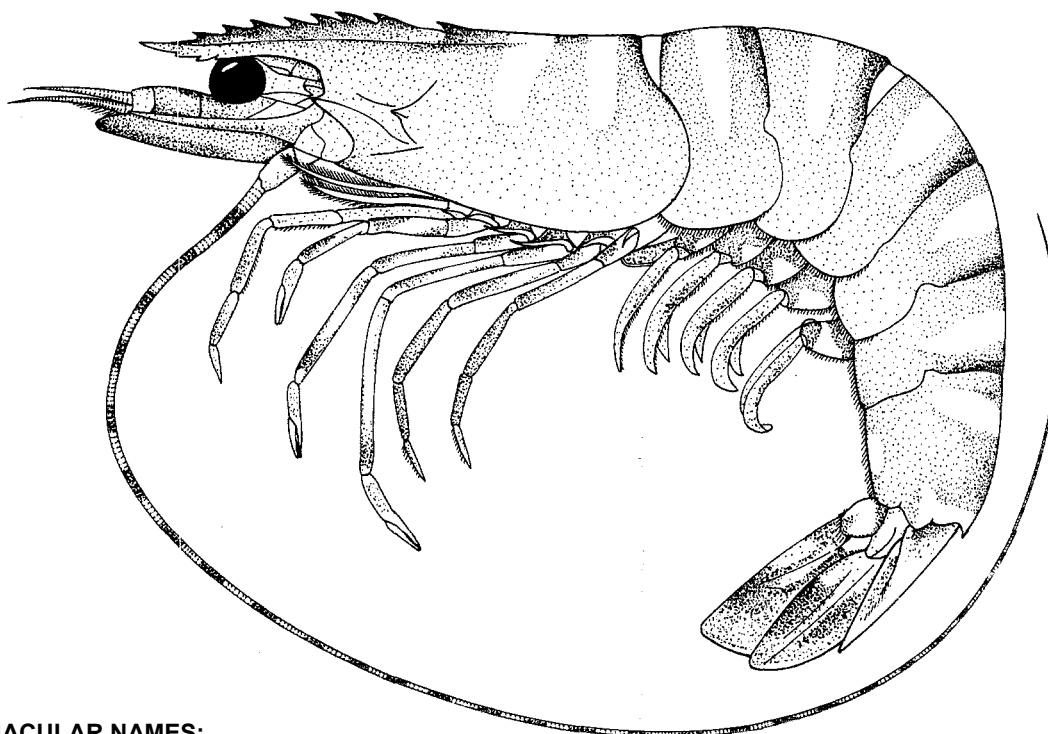
## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian ocean)

<i>Penaeus (Penaeus) semisulcatus</i> De Hoan, 1844
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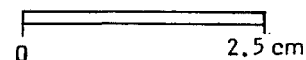
OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

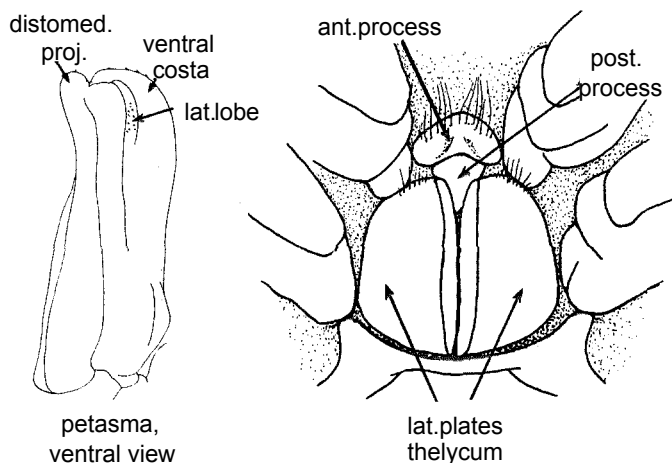
FAO :           En - Green tiger prawn  
                  Fr - Crevette tigrée verte  
                  Sp - Camarón tigre verde

NATIONAL



## DISTINCTIVE CHARACTERS:

Carapace smooth. Rostrum armed with 5 to 8 teeth on dorsal, and 2 to 4 teeth on ventral margin; adrostral crest and groove extending beyond epigastric tooth; postrostral crest almost reaching posterior margin of carapace, with a distinct median groove; gastrofrontal crest absent; antennal crest very prominent, ending above posterior third of hepatic crest; gastro-orbital crest extending over posterior 2/3 of distance between hepatic spine and orbital margin; hepatic crest straight, sloping anteroventrally; fifth pereopod with exopod. Petasma (in males) with distomedian projections reaching as far as costae; free border of ventral costae unarmed or minutely serrate near apex; outer surface of lateral lobes, minutely tuberculate. Thelycum (in females) with lateral plates, their median margins forming tumid lips; anterior process with raised edges, delimiting a depressed area; posterior process convex, partly inserted between lateral plates.



Colour: body pale brown, sometimes greenish; carapace often with 2 yellow-cream dorsal transverse bands; abdomen with brown-grey and pale yellow dorsal transverse bands; antennae banded white and brown; pereopods and pleopods dull red to brown grey, with white, sometimes bluish, specks; proximal part of uropods yellowish, distal part brown-bluish to brown greenish; proximal part of uropods yellowish, distal part brown-bluish to brown-greenish, tips bluish or reddish, fringe of setae usually brown-red. Juveniles are creamish, with irregular mottled brown bands on all abdominal segments.

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Penaeus monodon: adrostral crest and groove reaching at most as far as epigastric tooth (extending beyond epigastric tooth in P. semisulcatus); hepatic crest horizontal (sloping anteroventrally in P. semisulcatus); fifth pereopod without exopod (with exopod in P. semisulcatus); also differences in colouration.



P. monodon

Penaeus (Fenneropenaeus) species: hepatic crest absent; body white to pinkish, never banded.

Other species of Penaeus: adrostral crest and groove long, extending near to posterior margin of carapace; gastrofrontal crest present (absent in P. semisulcatus); distal part of uropods generally blue.



**P. semisulcatus**  
anterior part of carapace

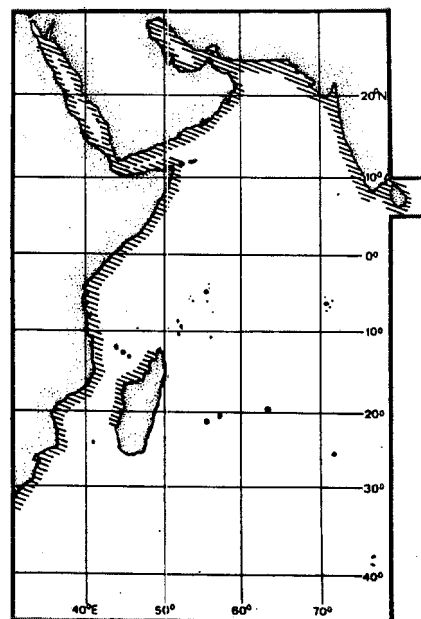
**SIZE:**

Maximum total length: males, 18 cm; females, 23 cm.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, from south and east Africa to India and Sri Lanka, including the Red Sea, the "Gulf" and western Madagascar. Further east it extends as far as Korea, Japan, the Philippines, New Guinea and northern Australia; the species has also entered the eastern Mediterranean through the Suez Canal.

Inhabits the continental shelf from the coastline to depths of about 130 m but is most abundant in waters less than 60 m deep on mud, sandy-mud or sandy-grit; the species can form small shoals and is predominantly nocturnal, burying in the substrate in daytime; mostly fished at night when the highest catches are obtained, but in some areas also by day.



**PRESENT FISHING GROUNDS:**

In the Red Sea, the Gulf of Aden and the "Gulf" it is very abundant and of major commercial importance, especially in the "Gulf" where the shrimp fishery is based on this species; also fished along the African coast where it is one of the dominating species; abundant in Sri Lanka and Pakistan.

It is cultivated in Kuwait (in tanks) and India.

**CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species by FAO in Fishing Area 51.

Caught mainly with otter trawls and drift nets; also taken with boat and shore seines, beam trawls, stake nets and traps.

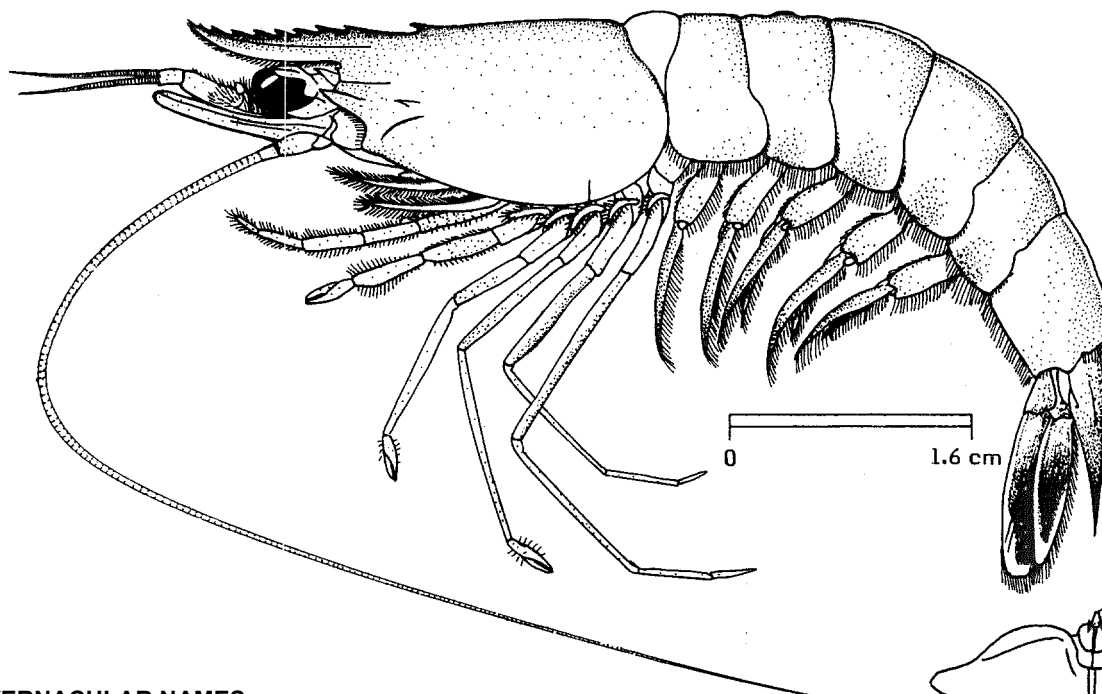
Marketed mostly fresh and frozen; also canned.

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Trachypenaeus curvirostris* (Stimpson, 1860)

OTHER SCIENTIFIC NAMES STILL IN USE: None



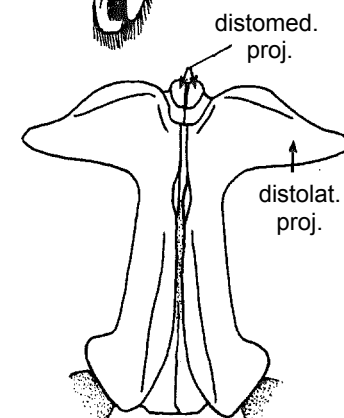
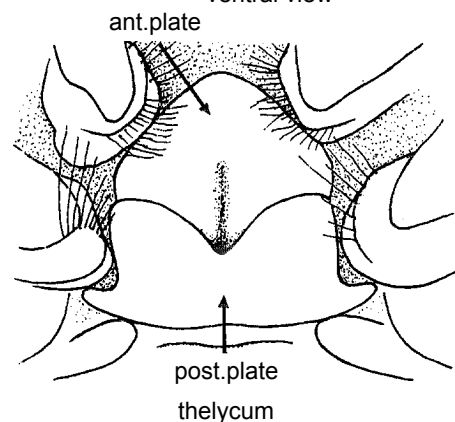
## VERNACULAR NAMES:

FAO :           En - Southern rough shrimp  
                  Fr - Crevette gambri archée  
                  So - Camarón fijador arquero

NATIONAL:

## DISTINCTIVE CHARACTERS:

Entire body densely pubescent. Rostrum armed with 7 to 11 dorsal teeth, reaching distal half of second antennular article or little beyond, usually uptilted, straight or upcurved; cervical groove very feeble; hepatic groove discernible; longitudinal suture short; pterygostomian angle blunt or sharp; abdomen with a small median tubercle on second segment and a middorsal crest on last 4 segments; telson armed with 3 or 4 pairs of small movable lateral spines subequal in size; epipod present on first 3 pereopods; fifth pereopod usually well exceeding antennular peduncle, but in some populations reaching only second article of it. Petasma (in males) with broad, wing-like distolateral projections, directed laterally and curved dorsoventrally; distomedian projections small, curved ventrally. In females, anterior plate of thelycum concave anteriorly, with a middle groove posteriorly and a bluntly pointed anterior margin; posterior date notched anteromedially; in fertilized specimens the groove can be hidden and the notch obliterated; coxae of 4th pereopods often with a small projection, always densely fringed with setae.

petasma,  
ventral viewpost.plate  
thelycum

Colour: body pink to reddish brown, sometimes whitish on sides; abdominal crest whitish; pereopods white with some pink; pleopods white with red patches or reddish brown; uropods bright red to reddish brown, sometimes dark brown with distinct white margins.

### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Trachypenaeus sedili: different configuration of petasma and thelycum; uropods yellowish with grey or dark brown centre and margins (red to red-brown with distinct white margins in T. curvirostris).

T. granulosus: epipod present only on third pereopod (on first 3 pereopods in T. curvirostris); uropods red to red-brown, generally with distinct golden margins; different configuration of petasma and thelycum.

### **SIZE:**

Maximum total length: males, 8.1 cm; females, 10.5 cm.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, from south and east Africa to India and Sri Lanka, including the Red Sea, the "Gulf" and Madagascar. Further east, it extends as far as Japan, the Philippines and Australia; the species entered the eastern Mediterranean through the Suez Canal.

Found from 10 to 300 m depth on sand or mud but it is fished only in waters less than 60 m; more easily available at night.

### **PRESENT FISHING GROUNDS:**

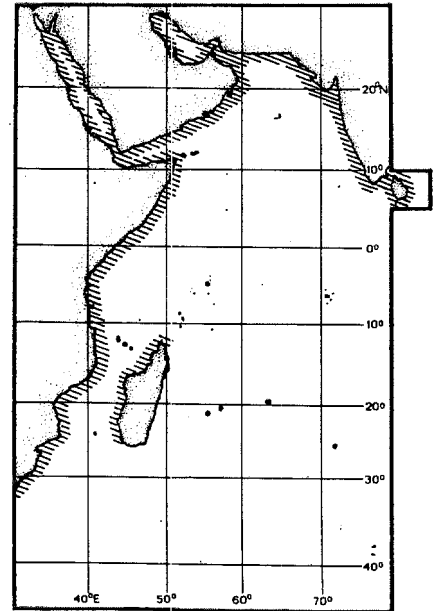
Caught in small numbers in Madagascar; in the Red Sea, the Gulf of Aden, the "Gulf" and the Arabian Sea the species is fished in small quantities along with other shrimps.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

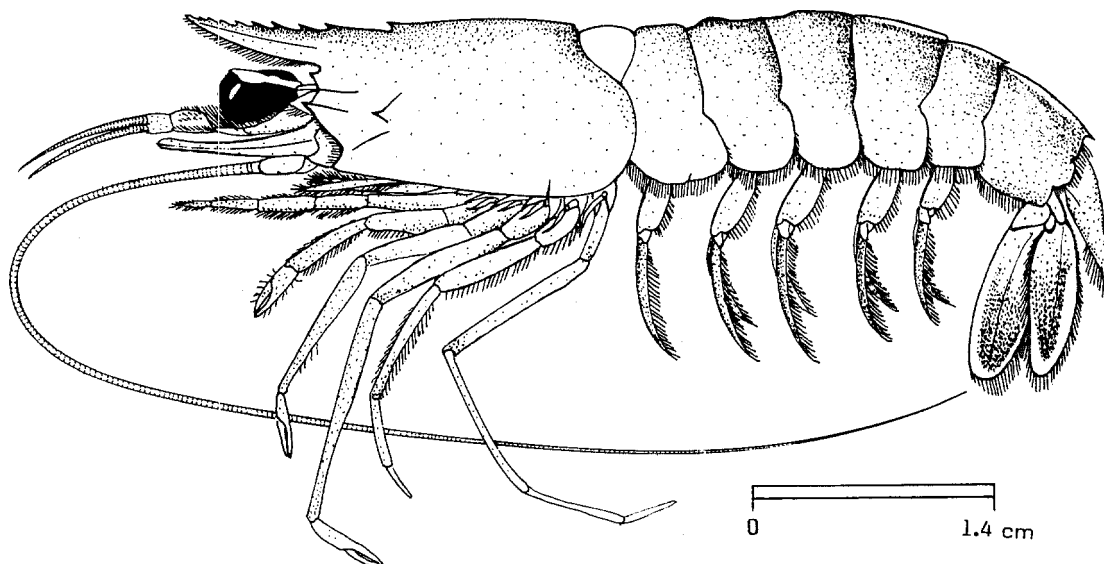
Caught with otter trawls, shrimp gill nets and artisanal gear.

Marketed mostly fresh, dried or cooked.



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)Trachypenaeus granulosus (Haswell, 1879)OTHER SCIENTIFIC NAMES STILL IN USE: Trachypenaeus pescadorensis Schmitt, 1931

## VERNACULAR NAMES:

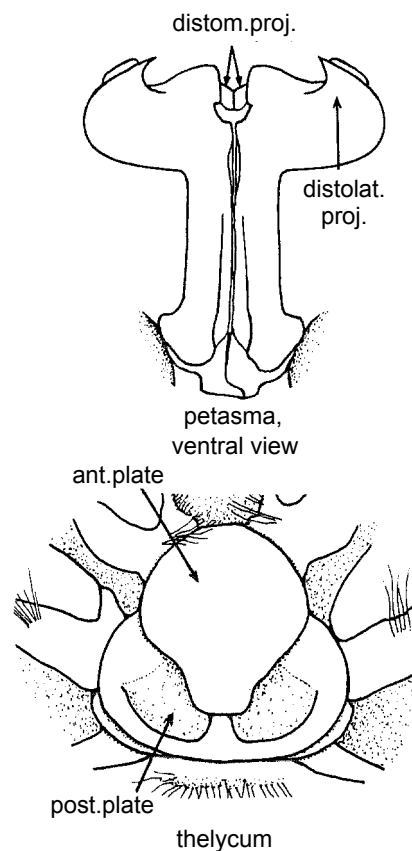
FAO :           En - Coarse shrimp  
                  Fr - Crevette gambri grenue  
                  Sp - Camarón fijador de granos

NATIONAL:

## DISTINCTIVE CHARACTERS:

Entire body densely pubescent. Rostrum armed with 9 to 11 dorsal teeth, reaching to distal half of second antennular article or little beyond, upcurved in females, straight in males; hepatic and cervical grooves discernible, longitudinal suture short, pterygostomial angle blunt; abdomen with a small dorsal tubercle on second segment and a middorsal crest on last 4 segments; telson armed with a pair of subapical, small, movable spines and 2 or 3 pairs of spinules; epipod present on third pereopod only; fifth pereopod extending beyond antennular peduncle, usually by dactyl and part of propodus. Petasma (in males) with very broad distolateral projections, their tips curving forward in a broad sweep and then inward; distomedian projections small, curved ventrally. In females, anterior plate of thelycum flat or slightly concave, rounded distally and with a posterior rounded projection which can be very prominent and is often fused to posterior plate; posterior plate excavate on either side of median convexity.

Colour: body pinkish to red, sometimes yellowish or paler on sides; abdominal crest whitish; pereopods pale with some red and usually some yellow; pleopods white-pinkish with some red; uropods red with generally distinct yellow margins.





## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Trachypenaeus curvirostris and T. sedili: epipod on first 3 pereopods (only on third pereopod in T. granulosus); uropods either with distinct white margins or yellowish, with a grey or dark brown spot (reed, generally with distinct yellow margins in T. granulosus); very different configuration of petasma and thelycum.

## SIZE:

Maximum total length: males, 7.2 cm; females, 9.5 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs in the "Gulf", the south-west and south-east coasts of India and off Sri Lanka. Further east it extends as far as Taiwan Island, the Philippines and Australia, but its distribution is scattered.

Found from 5 to 80 m depth on mud, hard sand or rocky bottom; it is more easily available at night.

## PRESENT FISHING GROUNDS:

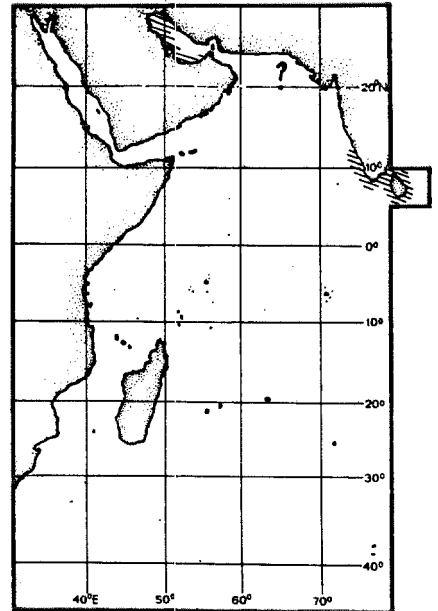
Stray catches are taken in the "Gulf" and along the southern coast of India; it is more abundant on muddy bottoms off the northeast coast of Sri Lanka.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught mainly with otter trawls and artisanal gear.

Marketed fresh, dried or cooked.

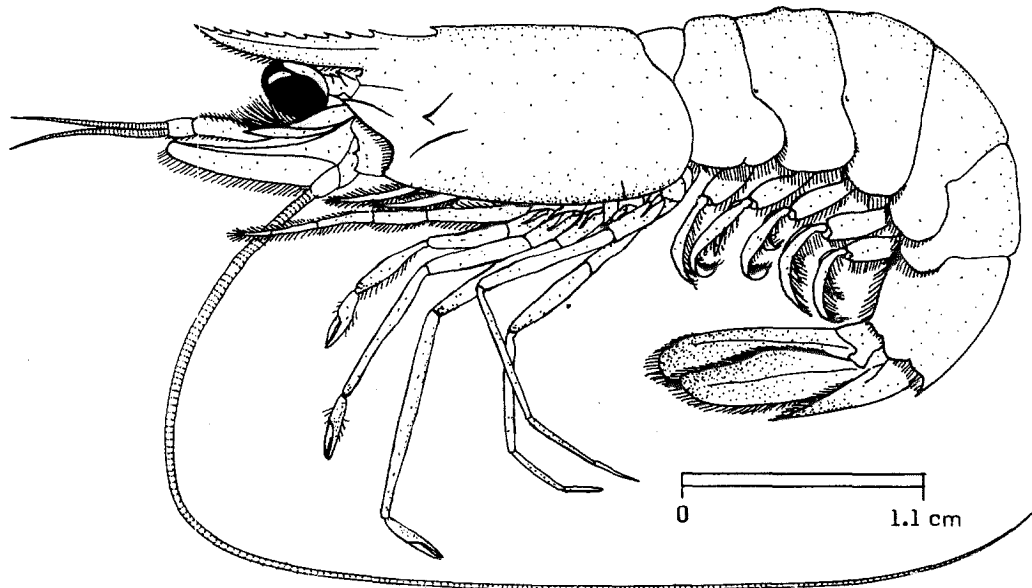


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: PENAEIDAE

FISHING AREA 51  
(W. Indian Ocean)*Trachypenaeus sedili* Hall, 1961

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

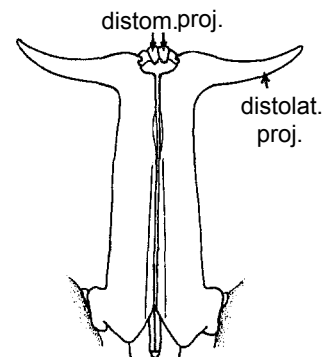
FAO : En - Malayan rough shrimp  
Fr - Crevette gambri malaise  
Sp - Camarón fijador malayo

NATIONAL:

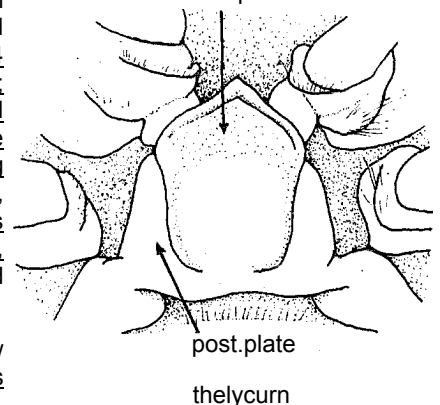
## DISTINCTIVE CHARACTERS:

Entire body densely pubescent. Rostrum armed with 8 to 10 (rarely 8) dorsal teeth, reaching to distal half of second antennular article, generally strongly upcurved in females, straight in males; hepatic and cervical grooves discernible; longitudinal suture short; pterygostomian angle bluntly pointed; abdomen with a small dorsal tubercle on second segment and a middorsal crest on last 4 segments; telson armed with 4 pairs of minute lateral, movable spines, the penultimate pair the largest; epipod rescent on first 3 pereopods; fifth pereopod reaching only to third antennular article (or nearly so). Petasma (in males) with long, horn-like distolateral projections directed laterally, their tips slightly curving forward; distomedian projections small, curved ventrally. In females, anterior plate of thelycum with strongly raised anterior and lateral margins distally pointed; posterior plate also with strongly raised lateral margins, the whole making a widened concave armchair-like structure (in fertilized specimens concavity much reduced).

Colour: body yellowish-white to pale pink, often with dark yellow patches, rostrum darker; pereopods and pleopods of same colour; uropods yellowish with grey or dark brown on middle and margins.



petasma,  
ventral view  
ant.plate



### **DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

Trachypenaeus curvirostris: different configuration of petasma and thelycum; uropods red to red-brown with distinct white margins yellowish with grey or dark brown on middle and margins in T. sedili).

T. granulosus: epipod present on third pereopod only (on first 3 pereopods in T. sedili); uropods red to red-brown, generally with distinct golden-yellow margins; different configuration of petasma and thelycum.

### **SIZE:**

Maximum total length: males, 5.1 cm; females, 8.8 cm.

### **GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Within the area, the species is only known from south India and Sri Lanka. Also known from the Malay Peninsula and the Gulf of Thailand.

Found on mud or sand bottom from near the shore to about 45 m depth.

### **PRESENT FISHING GROUNDS:**

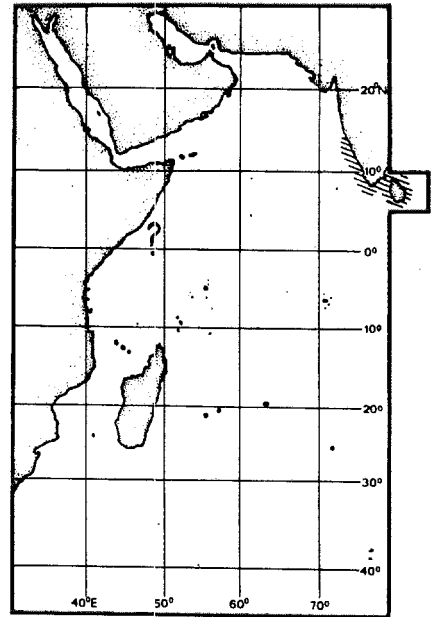
Sporadic occurrence in the landings in south India and on the north-east coast of Sri Lanka.

### **CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:**

Separate statistics are not reported for this species.

Caught with otter trawls and artisanal gear.

Marketed fresh, dried or cooked.



## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W. Indian Ocean)

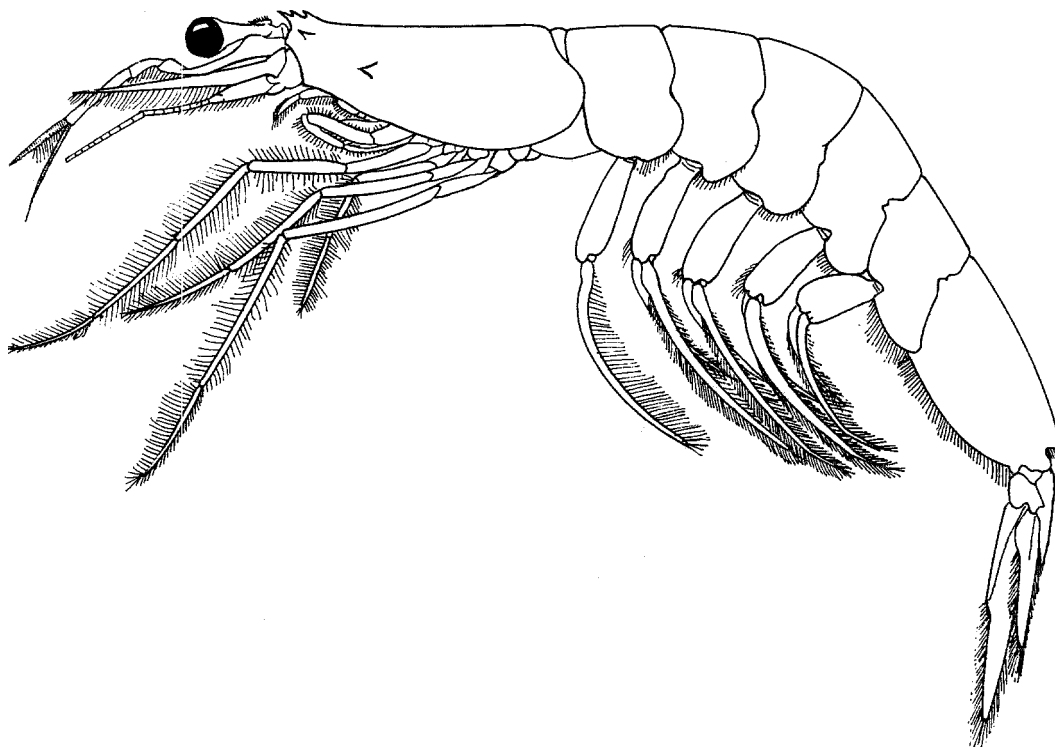
## SERGESTIDAE

## Sergestid shrimps

Small-sized shrimps; carapace with poorly developed crests and grooves, often wanting; rostrum shorter than the eye-stalk, generally small and sometimes even absent; branchiae few (not more than 8 on each side) or absent; pleura of first abdominal segment covering that of second somite; in males, lower antennular flagella with a clasping organ; first pair of pereopods with or without pincers; second and third pairs of pereopods with small pincers; fourth and fifth pairs of pereopods shorter than anterior legs (fifth pair strikingly shorter) or absent; in males, petasma present on first pleopods.

The representatives of this family are marine or marine and estuarine; species belonging to the genera Acetes and Sicyonella are found in shallow waters, in generally less than 50 m depth, while species of Sergestes and Sergia occur both in relatively shallow areas as well as in deeper waters (from about 30 to 1800 m depth).

In Fishing Area 51, only the species of Acetes are fished for. Although they are very small, they are regularly consumed and afford a major source of protein to the coastal population.



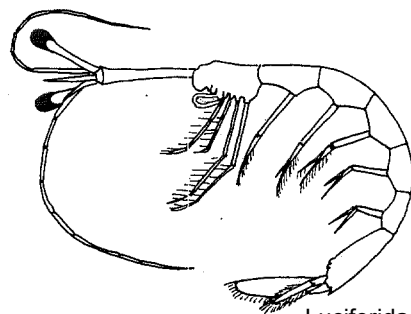
**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Luciferidae: head greatly elongated; only third pair of pereopods with pincers; no branchiae; very small planktonic species.

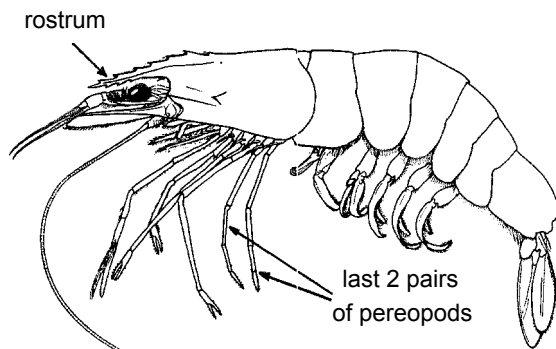
Superfamily Penaeoidea: last 2 pairs of pereopods well developed, of about the same size as the others; rostrum usually extending beyond eye; numerous branchiae (more than 8 on each side).

Shrimps belonging to the Infraorder Caridea: pleura of second abdominal segment overlapping those of first and third segments; no pincers on third pair of pereopods.

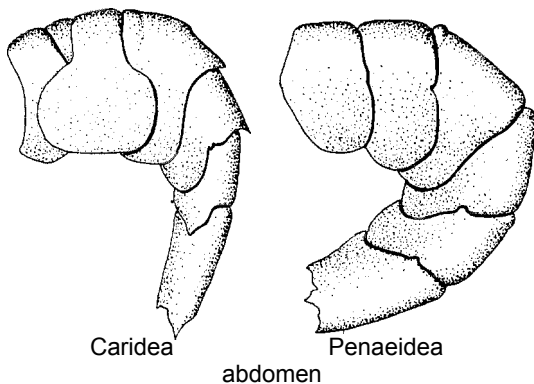
Order Mysidacea: carapace loose posterior to cervical groove, not fused with last thoracic segments; legs, usually feather-like and split; female carrying an egg-pouch below the thorax.



Luciferidae



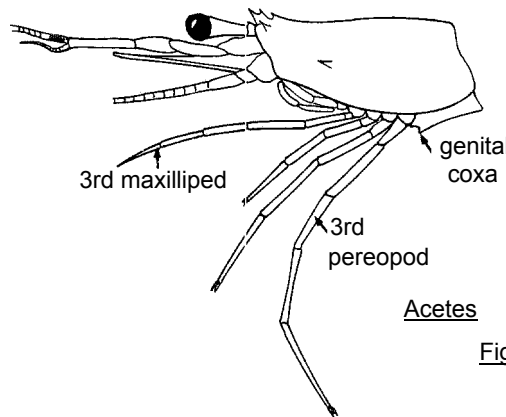
Penaeoidea



Caridea

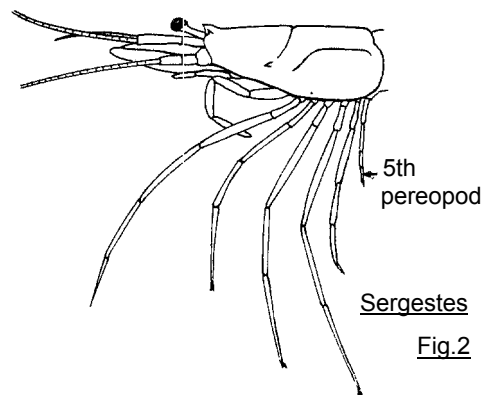
abdomen

Penaeoidea



Acetes

Fig.1



Sergestes

Fig.2

**KEY TO GENERA OCCURRING IN THE AREA: \***

- 1a. Fourth and fifth pairs of pereopods entirely lacking except for a pair of protuberances (genital coxae) on male (Fig. 1); first maxillae and first maxillipeds without palp; second maxillae with a single undivided lobe ..... Acetes
- 1b. Fourth and fifth pereopods well developed although fifth much shorter than fourth (Fig. 2); first maxillae and first maxillipeds with palp; second maxillae with 2 lobes .. Other genera

\* Restricted to the identification of Acetes, as all other genera are of no interest to fisheries.

**LIST OF SPECIES OF INTEREST TO FISHERIES OCCURRING IN THE AREA:**

- Acetes erythraeus Nobili, 1905
- Acetes indicus H. Milne Edwards, 1830
- Acetes japonicus Kishinouye, 1905
- Acetes johni Nataraj, 1947
- Acetes natalensis Bernard, 1950
- Acetes sibogae Hansen, 1919

The species of Acetes are small shrimps, the adult total length ranging between 1 and 4 cm. The body is translucent or semitranslucent, with black eyes and several pairs of red pigment spots (chromatophores) on the basis and endopods of uropods. They are mainly fished with push nets and bag nets, the latter being set near the shore against the flow of the tide; boat seines and shore seines are also used. Since they are mostly fished and consumed locally, it is difficult to have a precise idea of their total catch in Fishing Area 51. Only a small part of the catch is sold as fresh shrimp, while the greater fraction is dried, salted or fermented with salt.

Because of the small size of these shrimps, identification sheets are not provided for each species, but a key for their identification, as well as their respective geographical ranges are included in this family sheet.

**KEY TO SEXES OF ACETES:**

- 1a. A pair of protuberances (genital coxae) between third pereopods and first pleopods (Fig.1); lower antennular flagella with 1 or 2 clasping spines or modification thereof (Fig. 3); petasma present on first pleopods ..... male
- 1b. No protuberance in genital area; lower antennular flagella without spine; petasma absent ..... female

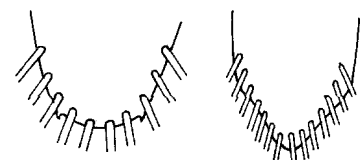


lower antennular flagellum of a male  
Fig. 3

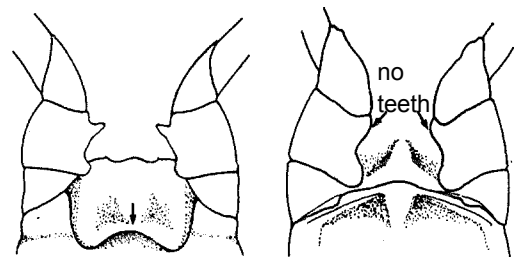
**KEY TO SPECIES OF ACETES OCCURRING IN THE AREA:**

**Females**

- 1a. Apex of telson rounded or truncated (Fig.4a)
- 2a. Third thoracic sternite produced posteriorly (Fig. 5) ..... A. japonicus
- 2b. Third thoracic sternite not produced posteriorly (Fig. 6)
- 3a. Tooth absent on distal inner margin of coxa of third pereopods (Fig. 6) ....A. natalensis
- 3b. Tooth present on distal inner margin of coxa of third pereopods .....A. johni



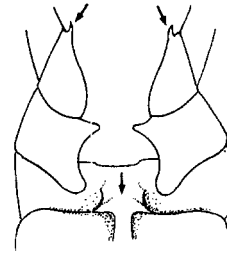
a) b)  
apex of telson  
Fig. 4



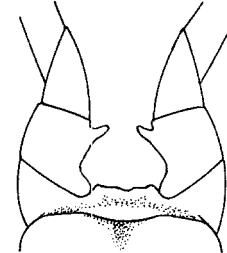
bases of third pereopods and third thoracic sternite, ventral view  
A. japonicus Fig.5      A. natalensis Fig.6

1b. Apex of telson triangular (Fig. 4b)

- 4a. Procurved tooth present between bases of first pair of pleopods
- 5a. Inner margin of basis of third pereopods with a sharply pointed projection; third and fourth thoracic sternites deeply channelled longitudinally (Fig. 7) ..... A. indicus
- 5b. Inner margin of basis of third pereopods without a sharply pointed projection; third and fourth thoracic sternites not channelled longitudinally (Fig. 8) ..... A. erythraeus
- 4b. Procurved tooth absent ..... A. sibogae



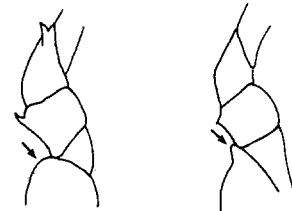
bases of third pereopods and third thoracic sternite, ventral view  
A. indicus Fig. 7



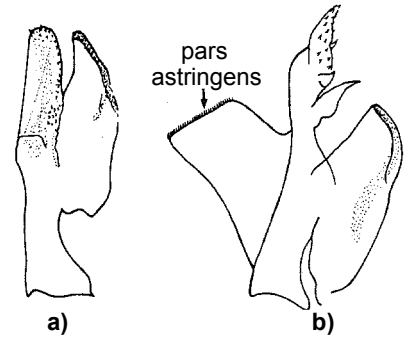
bases of third pereopods and third thoracic sternite, ventral view  
A. erythraeus Fig. 8

**Males**

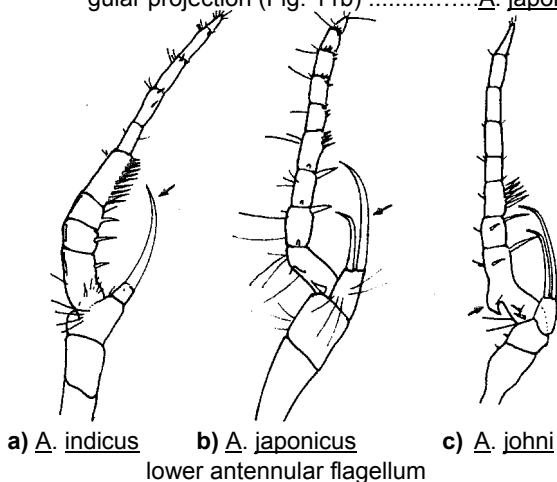
- 1a. Anterior margin of genital coxae rounded (Fig. 9a); petasma without pars astringens (Fig. 10a)
- 2a. Procurved tooth present between bases of first pair of pleopods; lower antennular flagella with 1 clasping spine (Fig. 11a) ..... A. indicus
- 2b. Procurved tooth absent; lower antennular flagella with 2 clasping spines (Fig. 11b)
- 3a. Lower antennular flagella with a triangular projection from upper end of first segment of main branch (Fig. 11c)
- 4a. Petasma with processus ventralis; capitulum cylindrical and elongated (Fig. 12a) ..... A. natalensis
- 4b. Petasma without processus ventralis; capitulum expanded on outer margin (Fig. 12b) ..... A. johni
- 3b. First segment of main branch of lower antennular flagella without triangular projection (Fig. 11b) ..... A. japonicus



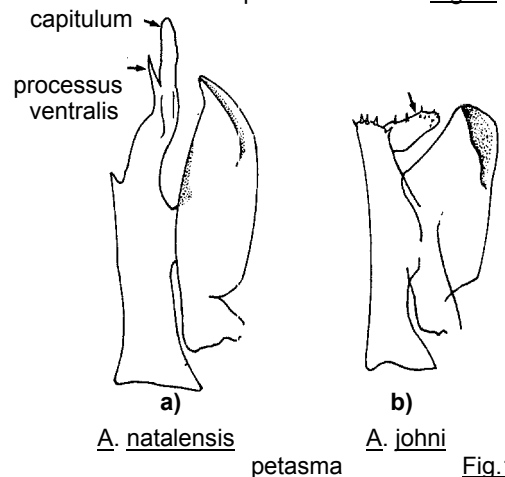
a) b)  
base of third pereopod Fig. 9



a) b)  
petasma Fig. 10



a) A. indicus b) A. japonicus c) A. johni  
lower antennular flagellum Fig. 11

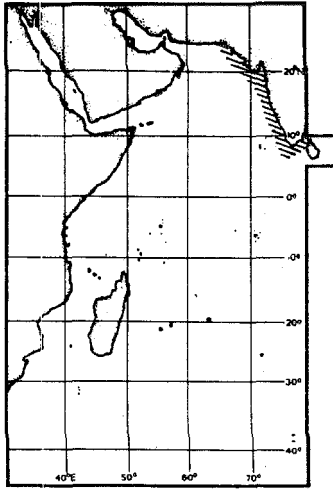


a) b)  
A. natalensis petasma A. johni Fig. 12

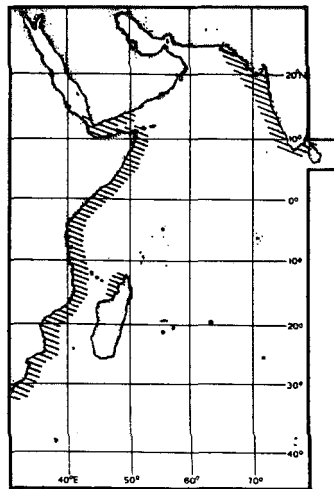
1b. Anterior margin of genital coxae pointed (Fig. 9b); petasma with pars astringens (Fig. 10b)

5a. Procurved tooth between bases of first pair of pleopods ..... A. erythraeus

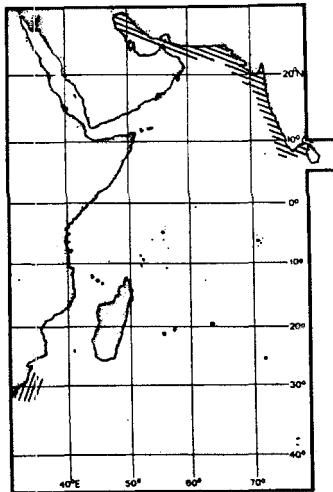
5b. Procurved tooth absent ..... A. sibogae



Acetes indicus

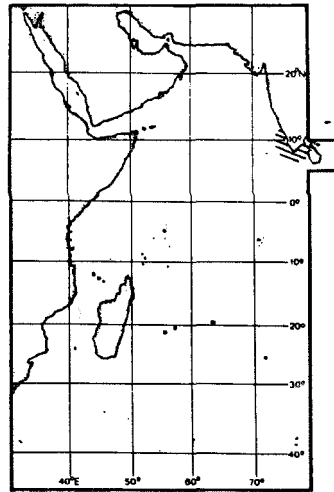


Acetes erythraeus



≡ Acetes japonicus

≡ Acetes natalensis



≡ Acetes sibogae  
and

≡ Acetes johnei



## FAO SPECIES IDENTIFICATION SHEETS

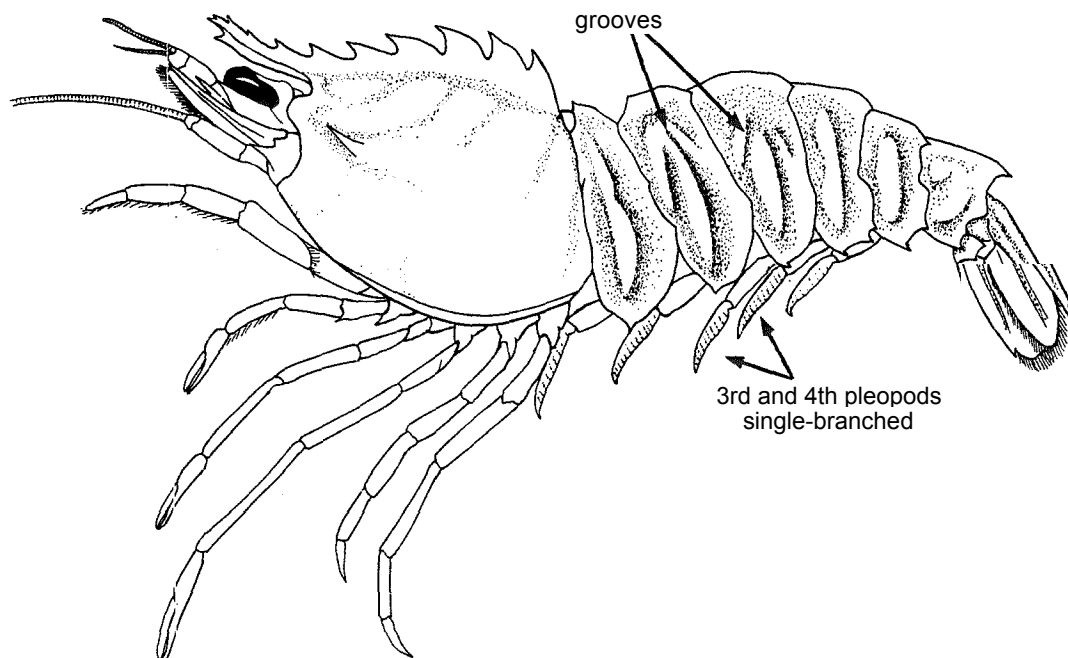
FISHING AREA 51  
(W. Indian Ocean)

## SICYONIIDAE

## Rock shrimps

Body robust, rigid, of stony appearance. Rostrum well developed (reaching to or exceeding distal end of eye stalk) and armed with teeth; base of eyestalk with a styliform projection on its inner surface and without a tubercle on its mesial (inner) border. Carapace without postorbital spine; cervical groove very faint or absent; exopod present only on first maxilliped. Last 2 pairs of pereopods well developed; endopods of second pair of pleopods in males bearing only appendix masculine; third and fourth pairs of pleopods single-branched. Telson usually armed with a fixed spine on each side of tip. A single, well developed arthrobranch on penultimate thoracic segment (hidden beneath the carapace).

All of the representatives of this family are marine. Some species inhabit shallow waters and are sporadically entering the catches. Other species are found only in deeper waters to about 400 m.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

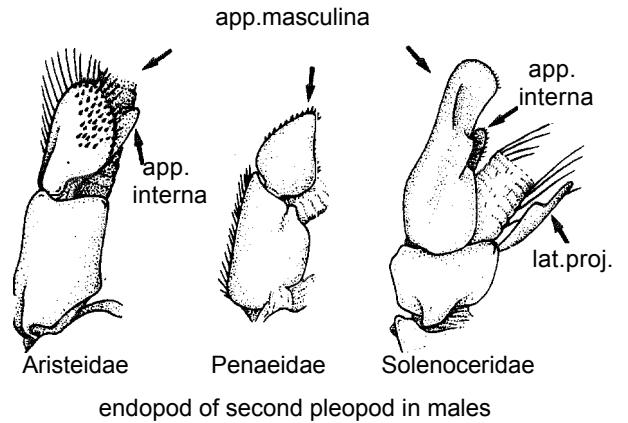
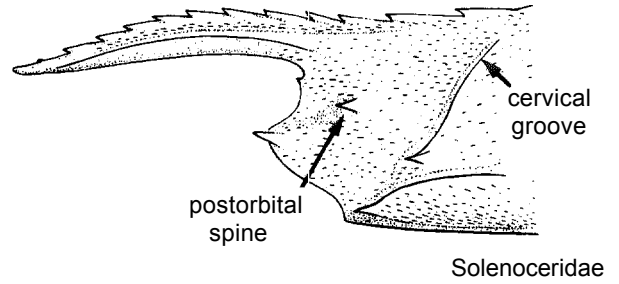
Solenoceridae, Aristeidae and Penaeidae: integument thinner and less rigid; abdomen without deep grooves or tubercles. Further distinguishing characters of these families are the following:

Solenoceridae: carapace with postorbital spines; cervical grooves long, usually ending at, or close to, dorsal midline; endopods of second pair of pleopods in males bearing appendix masculina, appendix interns and lateral projection; 2 well developed arthrobranches on penultimate thoracic segment.

Aristeidae: in most of the species cervical grooves long, ending at or close to dorsal midline; endopods of second pair of pleopods in males bearing appendix masculine and appendix interns; spines on each side of tip of telson movable; 2 well developed arthrobranches on penultimate thoracic segment.

Penaeidae: cervical grooves ending well below dorsal midline but clearly distinct; third and fourth pairs of pleopods biramous; exopods present posterior to first maxillipeds; telson without spines, or with fixed or movable spines on each side of tip.

Shrimps belonging to the Infraorder Caridea: pleura of second abdominal segment overlapping those of first and third segments; no pincers on third pair of pereopods.



**KEY TO GENERA OCCURRING IN THE AREA**

Sicyona only.

**LIST OF SPECIES OCCURRING IN THE AREA:**

- Sicyona lancifera (Olivier, 1811)
- ? Sicyona longicauda Rathbun, 1906
- Sicyona ocellata Stimpson, 1860
- ? Sicyona trispinosa De Men, 1907

## FAO SPECIES IDENTIFICATION SHEETS

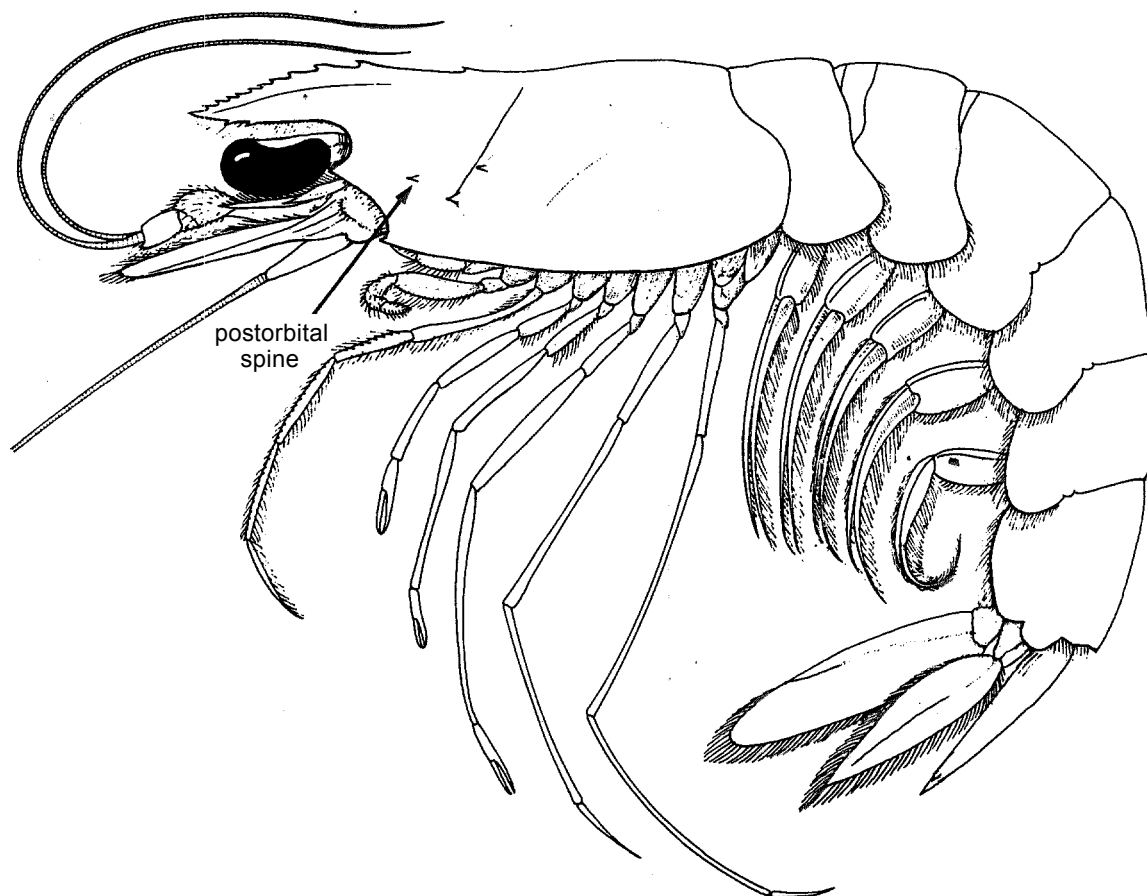
FISHING AREA 51  
(W. Indian Ocean)

## SOLENO CERIDAE

## Solenocerid shrimps

Shrimps with a well developed and toothed rostrum which extends at least to centre of eye diameter; no styliform projection at base of eyestalk, but a tubercle present on its mesial (inner) border. Carapace with postorbital spine and long cervical groove which end at, or close to, dorsal midline. Last 2 pairs of pereopods well developed; endopods of second pair of pleopods in males bearing appendix masculina appendix interna and lateral projection; third and fourth pairs of pleopods biramous. Telson tridentate in most species (with a fixed spine on each side of tip). Two well developed arthrobranchs on the penultimate thoracic segment (hidden beneath the carapace).

This family includes only marine representatives. All except four of the species occurring in the W. Indian Ocean are too small or not abundant enough to be of present or potential economic interest.



**SIMILAR FAMILIES OCCURRING IN THE AREA:**

Aristeidae, Penaeidae and Sicyoniidae: post-orbital spine on carapace absent. Further distinguishing characters of these families are the following:

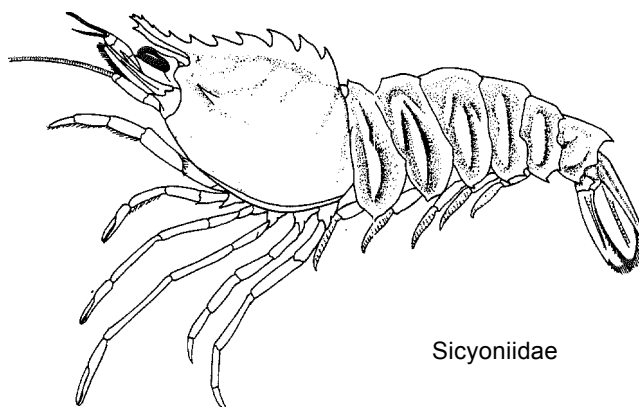
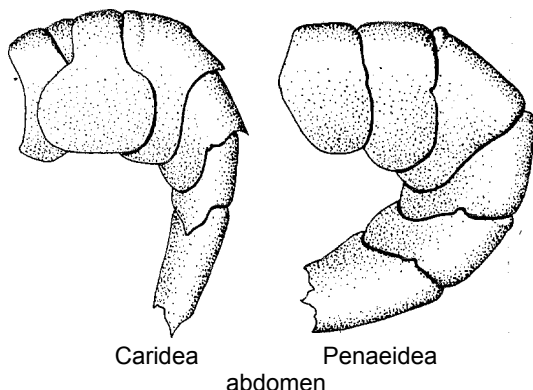
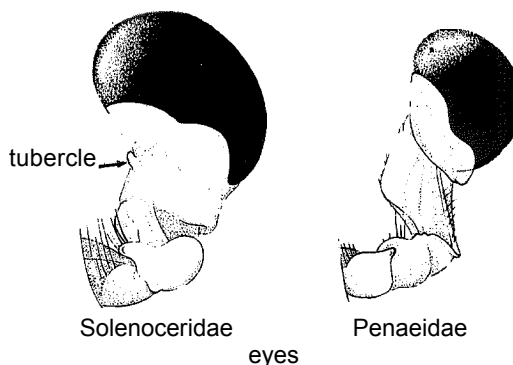
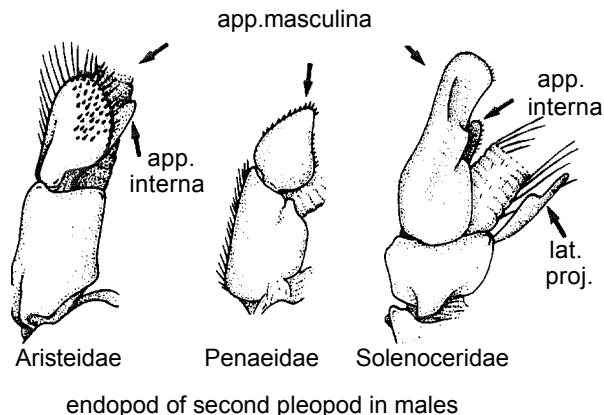
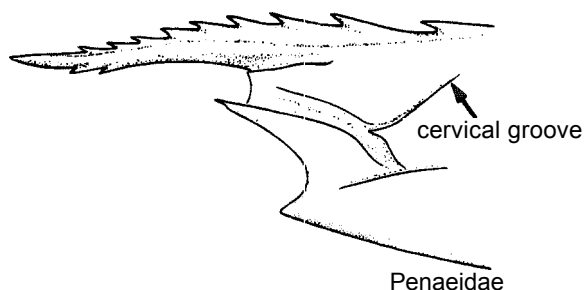
**Aristeidae:** telson bearing movable spines; endopods of second pair of pleopods in males bearing appendix masculina and appendix interns but no lateral projection.

**Penaeidae:** eyestalk without tubercle on inner border; cervical groove much shorter, ending well below dorsal midline of carapace; endopods of second pair of pleopods in males bearing appendix masculina only; a single well developed arthrobranch on penultimate thoracic segment (hidden beneath carapace).

**Sicyoniidae:** body thick, stony in appearance; abdomen with deep grooves and numerous tubercles; cervical groove very faint or absent.

**Sergestidae:** small-sized shrimps; rostrum very short; last 2 pairs of pereopods shorter than anterior legs (fifth pair much shorter) or absent.

Shrimps belonging to the Infraorder Caridea: pleura of second abdominal segment overlapping those of first and third segments; no pincers on third pair of pereopods.

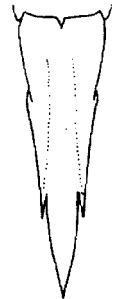


**KEY TO GENERA OCCURRING IN THE AREA:**

- 1a. Telson with several pairs of movable lateral spines anterior to fixed pair (Fig. 1a); podobranchs present on at least second and third maxillipeds ..... Haliporus
- 1b. Telson without movable spines, generally with a pair of fixed lateral spines (Fig. 1b); podobranchs restricted to second maxilliped
  - 2a. Dorsal and ventral antennular flagella lamellate (Fig.2a); lateral ramus of uropod generally lacking distolateral spine ..... Solenocera
  - 2b. Dorsal and ventral antennular flagella sub-cylindrical (occasionally ventral flagellum depressed) (Fig. 2b); lateral ramus of uropod armed with a distolateral spine
    - 3a. Epigastric (first rostral) tooth separated from second rostral tooth by about same interval as that between second and third rostral teeth (Fig. 3)
      - 4a. Rostrum low, with ventral margin straight or concave; submarginal carina present (Fig. 3) ..... Pleoticus
      - 4b. Rostrum deep, with ventral margin pronouncedly convex; submarginal carina absent (Fig.4) ....Hadropenaeus
    - 3b. Epigastric or epigastric and second rostral teeth separated from remaining teeth by a relatively long interval (Figs. 5 and 6)
      - 5a. Epigastric and second rostral teeth separated from remaining ones by a long interval; suprahepatic spine absent (Fig.. 5) ..... Hymenopenaeus
      - 5b. Epigastric tooth separated from other rostral teeth by a long interval; suprahepatic spine present (Fig. 6) ..... Haliporoides



a) Haliporus



b) Hadropenaeus

telson  
Fig. 1



dorsal



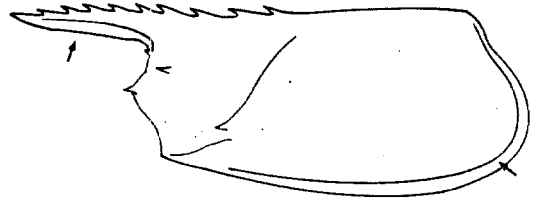
ventral



a) Solenocera

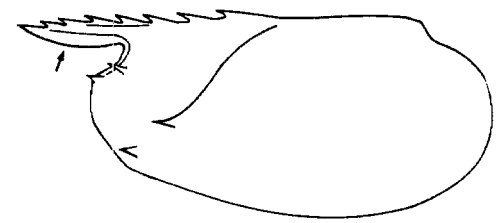
b) Pleoticus

cross section of antennular flagella  
Fig. 2



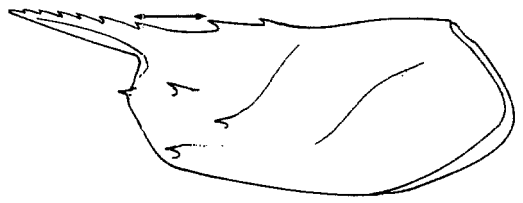
Pleoticus

Fig.3



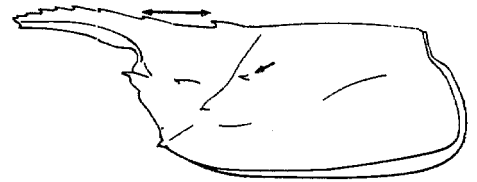
Hadropenaeus

Fig. 4



Hymenopenaeus

Fig.5



Haliporoides

Fig. 6

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

Hadropenaeus lucasii (Bate, 1881)

Haliporoides sibogae madagascariensis Crosnier, 1978

Haliporoides triarthrus Stebbing, 1914

SOLENO Hali 3

Haliporus taprobanensis Alcock & Anderson, 1899

Haliporus villosus Alcock & Anderson, 1894

Hymenopenaeus aequalis (Bate, 1888)

Hymenopenaeus fattahi Ramadan, 1938

Hymenopenaeus furici Crosnier, 1978

Hymenopenaeus halli Bruce, 1966

Hymenopenaeus laevis (Bate, 1881)

Hymenopenaeus propinquus (De Man, 1907)

Hymenopenaeus sewelli Ramadan, 1938

Pleoticus steindachneri (Balss, 1914)

Solenocera africana Stebbing, 1917

Solenocera algoensis Barnard, 1947

Solenocera bedokensis Hall, 1962

Solenocera choprai Nataraj, 1945

Solenocera comata Stebbing, 1915

Solenocera crassicornis (H. Milne Edwards, 1837)

Solenocera hextii Wood-Mason & Alcock, 1891

Solenocera koelbeli De Man, 1911

Solenocera pectinata (Bate, 1888) (? = S. pectinulata Kubo, 1949)

Solenocera waltairensis George & Muthu, 1970

SOLENO Soleno 4

SOLENO Soleno 5

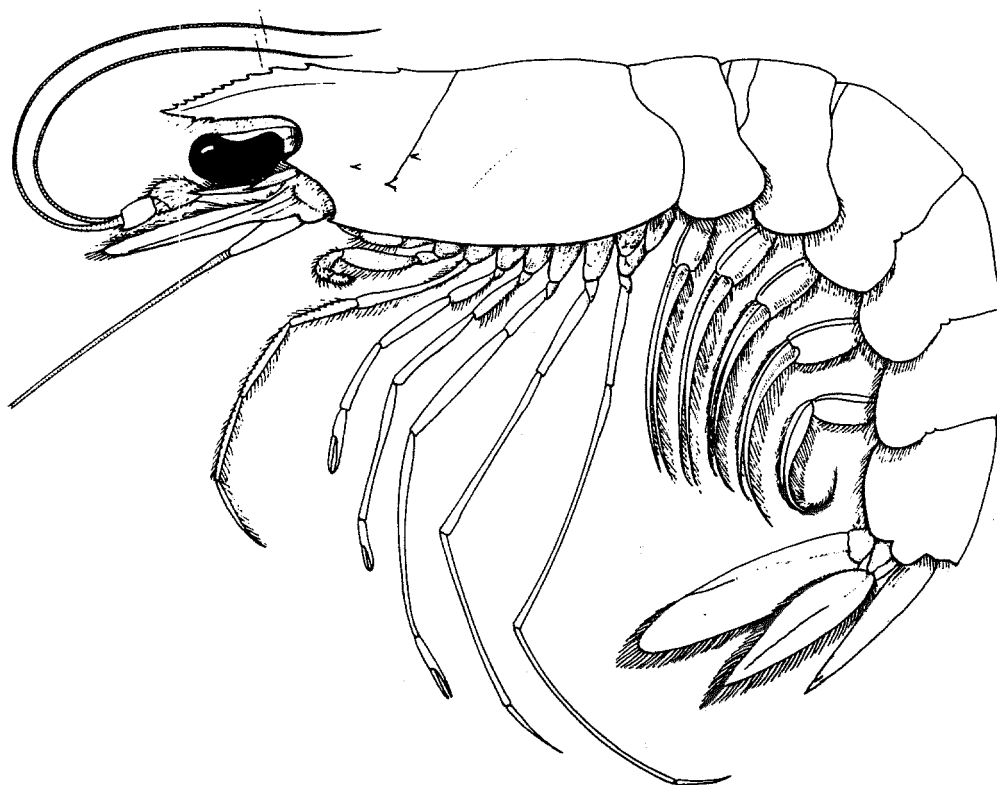
SOLENO Soleno 8

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SOLENO CERIDAE

FISHING AREA 51  
(W. Indian Ocean)

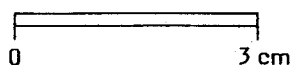
Haliporoides triarthrus Stebbing, 1914

OTHER SCIENTIFIC NAMES STILL IN USE : Hymenopenaeus triarthrus (Stebbing, 1914)

## VERNACULAR NAMES:

FAO : En - Knife shrimp  
Fr - Salicoque navaja  
Sp - Camarón navaja

NATIONAL:

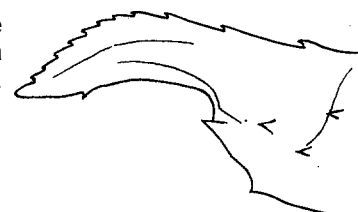


## DISTINCTIVE CHARACTERS:

Body finely pubescent. Rostrum very high and prominent, arched or straight, extending far beyond the eye, with 10 to 14 teeth on dorsal margin (2 behind the anterior margin of carapace) and 1 or 2 on ventral; no postrostral crest; cervical groove reaching dorsal midline; postorbital and pterygostomian spines present; suprahepatic spine also present, but very small; telson armed with a pair of fixed distolateral spines; antennular and antennal flagella longer than the body; first pereopods armed with 1 to 3 spines on merus, none on basis.

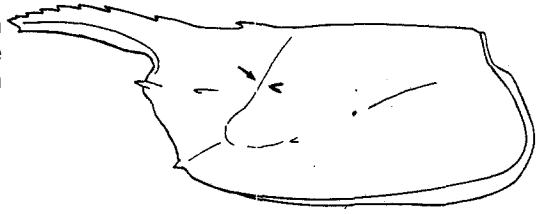
Two geographically separated subspecies of H. triarthrus, are recognized. The northern form (H. triarthrus vniroi, Crosmer 1978) has a lower rostrum which is not as strongly arched as in the southern form H. t. triarthrus.

Colour: uniformly red, frozen specimens paler.

H. triarthrus vniroiH. triarthrus triarthrus  
anterior part of carapace

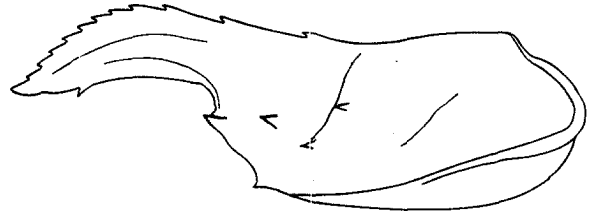
## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Haliporoides sibogae: usually 7 to 9 dorsal teeth on rostrum (usually 10 or 12 in H. triarthrus), suprahepatic spine stronger; merus of first pereopod with 3 to 5 spines (1 to 3 in H. triarthrus).



H. sibogae

Solenocera species: rostrum short, hardly exceeding the eye and without ventral teeth (extending far beyond eye and with ventral teeth in H. triarthrus); antennular flagella shorter than body; carapace hairless and with a distinct hepatic crest.



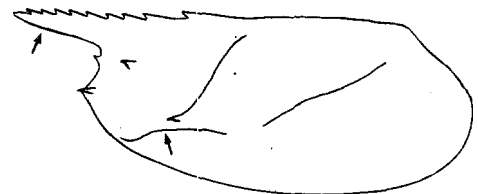
H. triarthrus

## SIZE:

Maximum total length: males, 15 cm; females, 17.5 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

South and southeast Africa from Table Bay (off Cape Town, South Africa) to central Mozambique (off Beira). H. triarthrus vniroi occurs off Mozambique, while H. t. triarthrus is found off South Africa.



Solenocera sp.  
carapace

Inhabits depths between 290 and 550 m on soft mud or sandy bottoms; off Mozambique, it is fished at depths of 500 to 550 m.

## PRESENT FISHING GROUNDS:

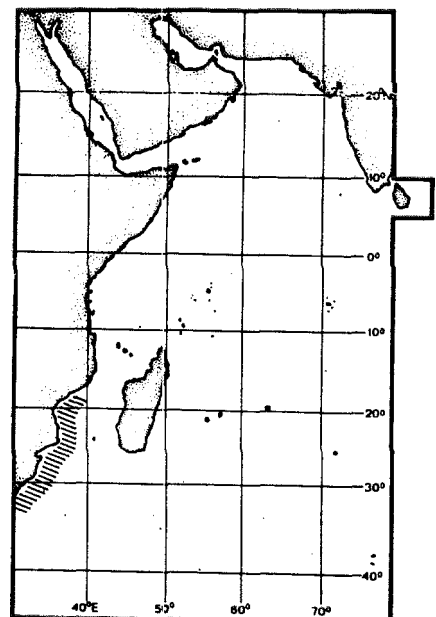
Of major commercial importance within its range; landed at Durban in South Africa and at Beira in Mozambique.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

The 1980 catch reported from Fishing Area 51 totalled 1,029 tons (South Africa only).

Caught with otter trawls.

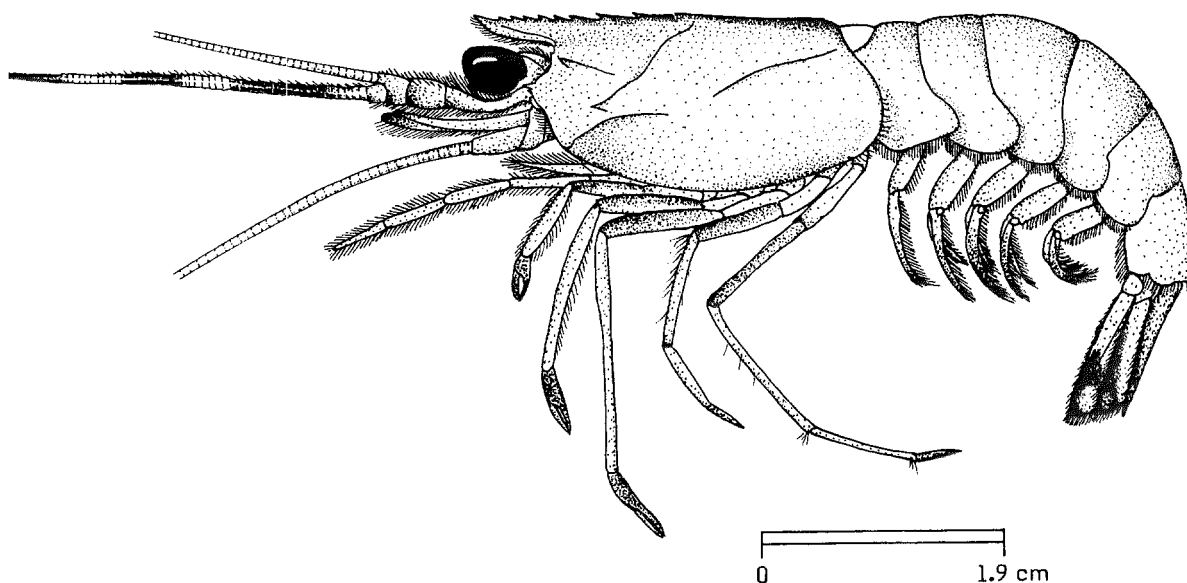
Marketed frozen; in South Africa also marketed fresh (headed) and peeled.





## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SOLENO CERIDAE

FISHING AREA 51  
(W. Indian Ocean)*Solenocera choprai* Nataraj, 1945OTHER SCIENTIFIC NAMES STILL IN USE: *Solenocera alticarinata* Kubo, 1949

## VERNACULAR NAMES:

FAO :           En - Ridgeback shrimp  
                   Fr - salicoque balafrée  
                   Sp - Camarón costurén

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body hairless except at base of rostrum where it is distinctly pubescent; rostrum reaching middle to 3/4 of eye, convex on ventral margin and with 6 to 9 dorsal teeth; postrostral crest markedly elevated and laminose, reaching posterior margin of carapace and interrupted by a notch just ahead of cervical groove; the latter is deep and reaches or almost dorsal midline; postorbital spine present; suprahepatic and branchiostegal spines absent; pterygostomial angle broadly rounded and unarmed; hepatic crest curved downward anteriorly, with a sharp bending near its anterior end delimiting a round loop just behind frontal margin of carapace; branchiodardic crest oblique, its anterior part curving ventrally; telson trifurcate, with a pair of fixed distolateral spines; fifth pereopod with a coxal spine.

Colour: body, pereopods and pleopods red; antennae banded dark red and white; uropods dark red, except for some white areas.



telson

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Solenocera crassicornis: postrostral crest low and rounded (markedly elevated and laminose in S. choprai); telson unarmed (with lateral spines in S. choprai); anterior part of hepatic crest differently shaped.

S. hextii: branchiocardiac crest very distinct and L-shaped (oblique in S. choprai); suprahepatic spine present (absent in S. choprai)

Other species of Solenocera: postrostral crest not laminose posterior to cervical groove.

## SIZE:

Maximum total length: males, 9.5 cm; females, 13 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs off east Africa, from Mozambique to Kenya and along the northwest and east coasts of the Arabian Sea (Pakistan to south India); also reported from the Red Sea and the "Gulf": Further east, it extends as far as the South China Sea and Japan.

Found at depths between 75 and 110 m on soft bottoms; probably also present in shallower waters.

## PRESENT FISHING GROUNDS:

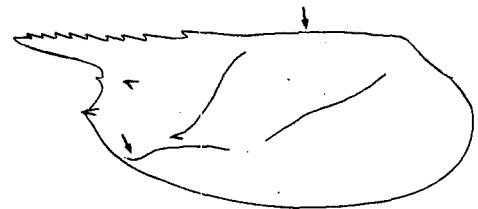
Obtained only in stray catches; found in small numbers among other shrimps within its distributional range.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

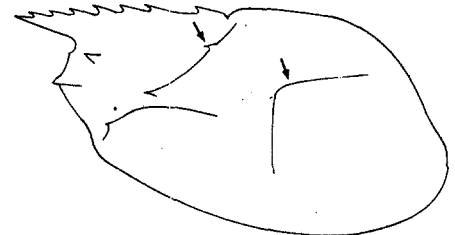
Separate statistics are not reported for this species.

Caught mostly with otter trawls.

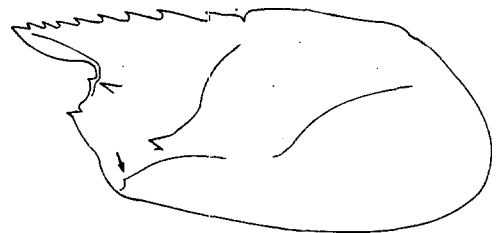
Marketed mainly fresh.



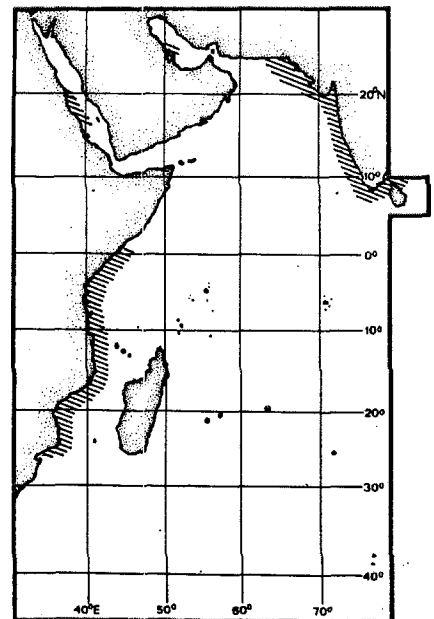
S. crassicornis



S. hextii

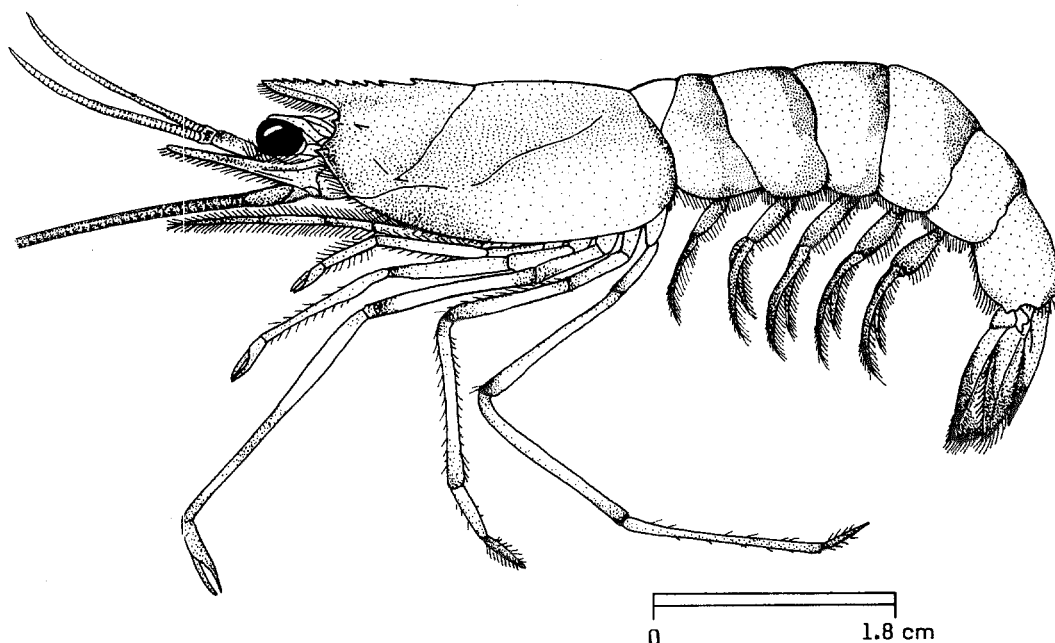


S. choprai  
carapace



## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SOLENO CERIDAE

FISHING AREA 51  
(W. Indian Ocean)Solenocera crassicornis (H. Milne Edwards, 1837)OTHER SCIENTIFIC NAMES STILL IN USE : Solenocera indica Nataraj, 1945  
Solenocera subnuda Kubo, 1949

## VERNACULAR NAMES:

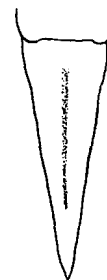
FAO : En - Coastal mud shrimp  
Fr - Salicoque des vases côtières  
Sp - Camarón fanguero de orilla

NATIONAL:

## DISTINCTIVE CHARACTERS:

Body hairless except at base of rostrum; rostrum reaching to distal margin of eye or little beyond, armed with 8 to 10 (12) dorsal teeth; its ventral margin slightly convex or straight; postrostral crest low and rounded, reaching posterior margin of carapace; cervical groove deep, reaching to, or nearly to, dorsal midline; postorbital spine present; suprahepatic and branchiostegal spines absent; pterygostomial angle unarmed; hepatic crest curved ventrally on anterior part, delimiting a broadly rounded loop slightly behind frontal margin of carapace; branchiocardic crest slightly sinuous and sloping anteroventrally; telson unarmed, not trifurcate; fifth pereopod without a coxal spine.

Colour: body, pereopods and pleopods reddish-orange to red; posterior margin of each abdominal segment darker; antennae, pleopods and uropods uniform red.



telson

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

None of the other species of *Solenocera* possess the characteristic unarmed telson of *S. crassicornis*. Further distinguishing characters of these species are:

*S. choprai*: postrostral crest markedly elevated and laminose (low and rounded in *S. crassicornis*); anterior part of hepatic crest differently shaped.

*S. hextii*: branchiocardiac crest very distinct and L-shaped (slightly sinuous in *S. crassicornis*); suprahepatic spine present (absent in *S. crassicornis*).

## SIZE:

Maximum total length: males, 9 cm; females, 14 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs in the "Gulf", along the northeast and east coasts of the Arabian Sea from Pakistan to south India and off Sri Lanka. Further east it extends as far as China, Japan and New Guinea.

Inhabits muddy bottoms close to the shore, to depths of at least 85 m; it has been fished in very shallow waters, but usually occurs in more than 20 m depth; the species presents a burrowing behavior.

## PRESENT FISHING GROUNDS:

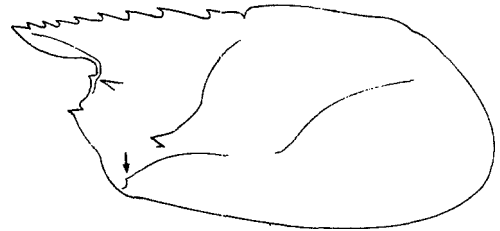
Along the west coast of India near Bombay, the species supports a commercial fishery. Elsewhere, it is often present in the landings, mixed with other shrimps.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

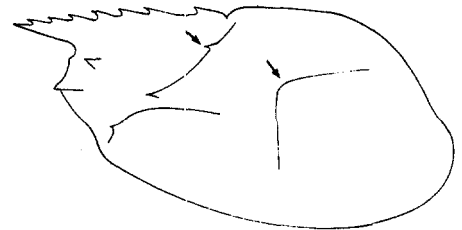
Separate statistics are not reported for this species.

Caught mainly with otter trawls; stake nets and boat seines are also used.

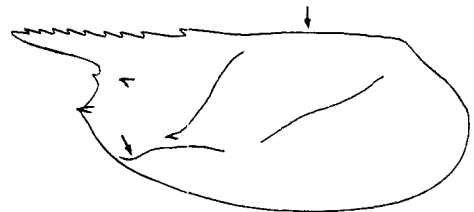
Marketed fresh, frozen, cooked, peeled and canned or as dried shrimp pulp.



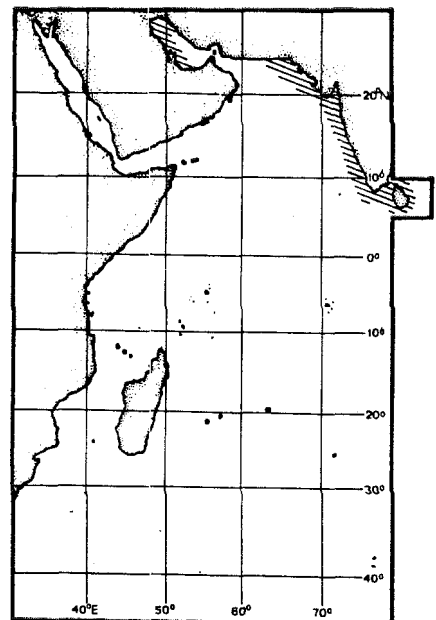
*S. choprai*



*S. hextii*



*S. crassicornis*  
carapace

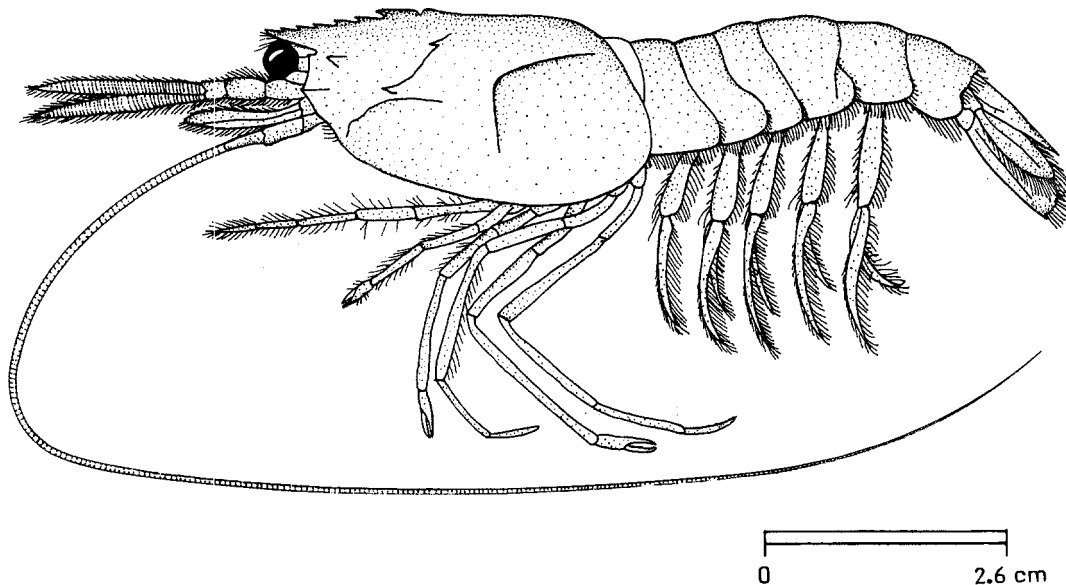


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: SOLENO CERIDAE

FISHING AREA 51  
(W. Indian Ocean)*Solenocera hextii* Wood-Mason & Alcock, 1891

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Deep-sea mud shrimp  
Fr - Salicoque des vases profondes  
Sp - Camarón fanguero de altura

NATIONAL:

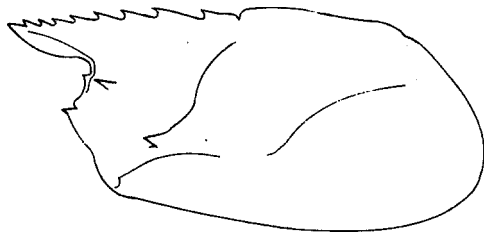
## DISTINCTIVE CHARACTERS:

Body hairless, except, the rostrum; rostrum high, reaching to about distal margin of eye, armed with 6 to 8 dorsal teeth, its ventral margin nearly straight; postrostral crest elevated and laminose, reaching posterior margin of carapace and interrupted by a notch just in front of cervical groove (in small specimens, the crest is less developed and the notch may be absent); cervical groove deep, reaching to, or almost, to dorsal midline; postorbital and suprahepatic spines present; branchiostegal and pterygostomial spines absent; hepatic crest curved ventrally on its anterior part, with a sharp bending near its anterior end; branchiocardiac crest very distinct and L-shaped (its posterior half nearly horizontal its anterior half turning ventrally at right angle); telson with a pair of fixed distal lateral spines (trifurcate); fifth pereopod with a coxal spine.

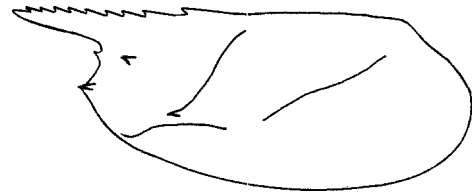
Colour: bright pink.

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

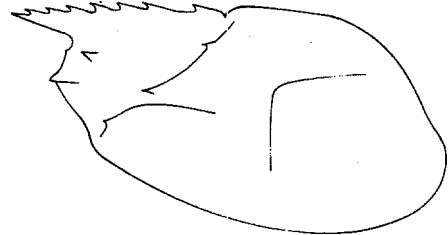
None of the other species of Solenocera have a suprahepatic spine or the characteristic L-shaped branchio-cardiac crest and groove of S. hextii.



S. choprai



S. crassicornis



**S. hextii**  
carapace

## SIZE:

Maximum total length: males, 12.7 cm; females, 13.8 cm.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, it occurs in the Arabian Sea from the Gulf of Aden to the south coast of India. Also present in the Bay of Bengal.

Found at depths between 115 and 500 m on soft bottoms.

## PRESENT FISHING GROUNDS:

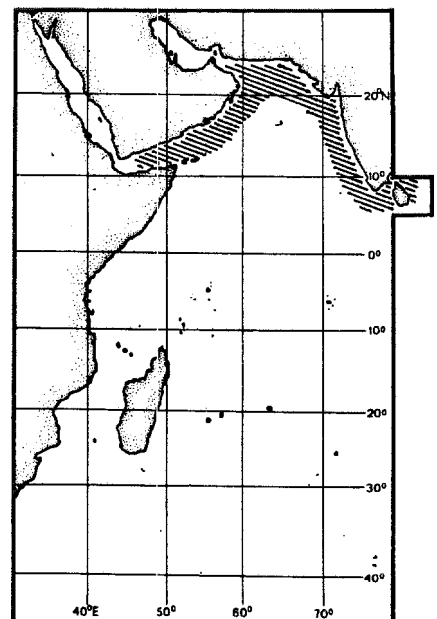
At present the species is not exploited, but is of potential interest and may become commercially important in the Gulf of Aden and off the southwest coast of India.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species.

Caught with otter trawls.

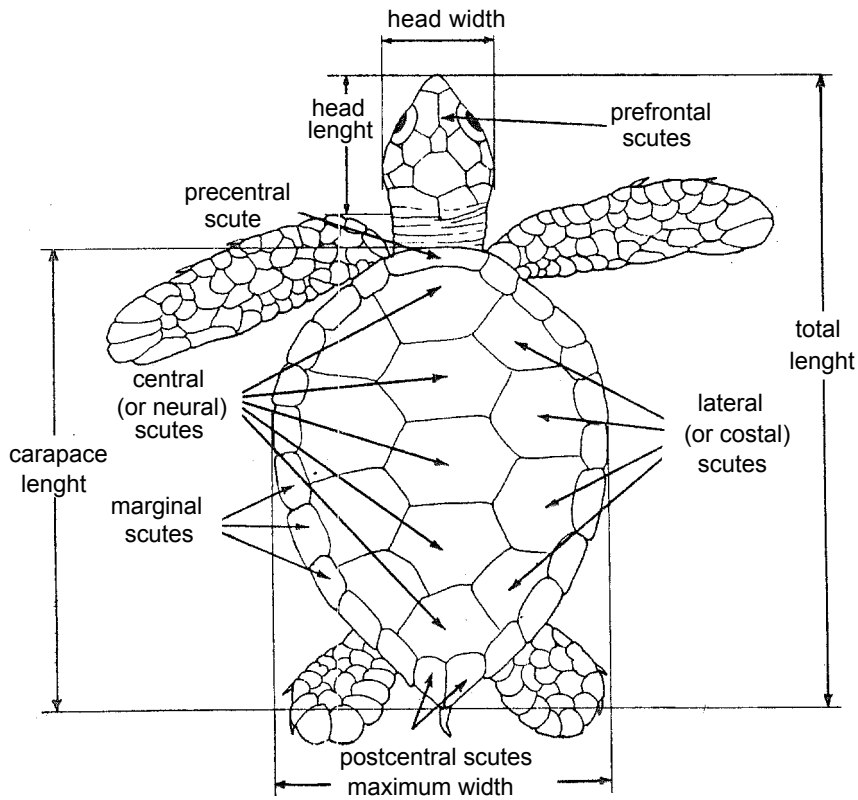
Occasionally marketed frozen.



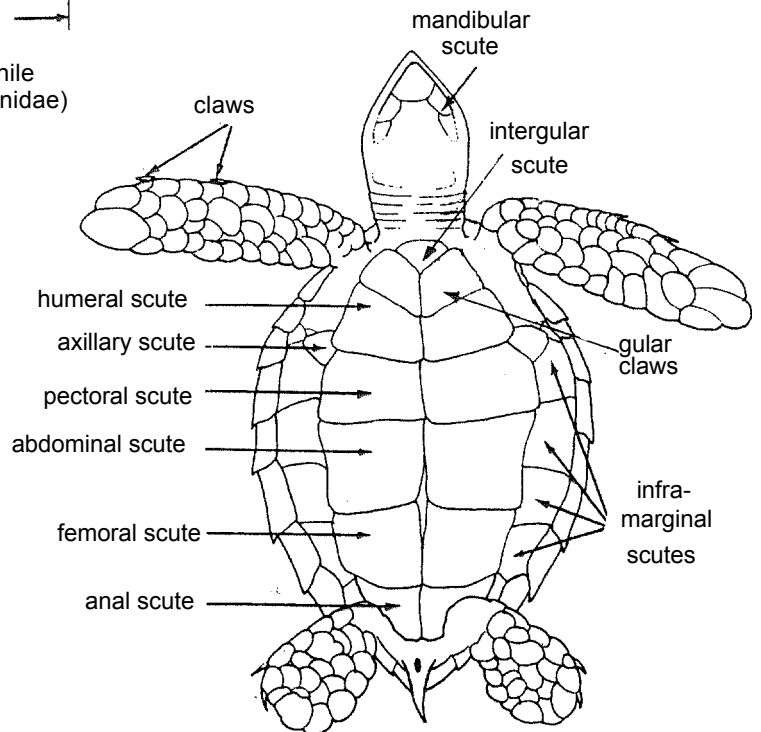


**TECHNICAL TERMS AND PRINCIPAL MEASUREMENTS USED**

(Straight-line distances)



dorsal view of a juvenile sea turtle (Family Cheloniidae)



ventral view of a juvenile sea turtle (Family Cheloniidae)



### GENERAL REMARKS

The most typical feature of a turtle is the hard shell encasing the entire body. This shell is composed of a layer of bones underneath and a layer of horn on the outside; the latter often, but not always, displays a geometrical pattern of lamellae or scutes (see basic arrangement and nomenclature in the above figures). The top of the shell or carapace is joined at the sides with the bottom or plastron and the latter is notched in front and rear where the limbs emerge from the shell. All turtles have a strong, horny beak; none have true teeth, although tooth-like projections may be present on the jaws. The limbs or flippers of sea turtles are paddle-shaped.

Sea turtles occur in all tropical and warm-temperate oceans. They inhabit shallow waters along coasts and around islands, but some species are believed to be highly migratory and are found in the open sea. They are swift swimmers and some are said to attain speeds of about 35 km per hour; unlike freshwater turtles they move forward by simultaneous action of the front flippers, when swimming. All species are compelled to return in regular intervals to the land during the nesting season when the females lay their eggs in a nest dug into the sandy beach. After a relatively long incubation period (usually from 45 days to two and a half months) the hatchlings go back to the sea. Very little is known about their movements and fate before they attain sexual maturity after 10 or more years. The majority of sea turtles are predominantly carnivorous, but some species are omnivorous or even herbivorous.

Since ancient times turtles have been held in high esteem as food for man. The flesh as well as the eggs are of delicate taste and much of the production goes frozen or canned to export markets for the preparation of turtle soup, calipee and other delicacies. Other uses are in the extraction of oil from turtle fat, in the tortoise shell industry and in the leather industry. Fishing gear at sea includes catch by hand, tangle nets, gillnets, seines and harpoons. The catch reported to FAO from Fishing Area 51 in 1980 totalled 52 t (Seychelles only), but unofficial catch data indicate more than 2 700 t annually for the whole area, principally green and hawksbill turtles.

Some marine turtle species are becoming scarce nowadays and are in bad need of protection from irrational exploitation; they are especially vulnerable on land during their nesting period. More recently, farming of sea turtles, especially of the green turtle, has been successfully introduced to some parts of the world; it is hoped that this technique will become more widespread in the near future and thus take off some of the fishing pressure exerted on the species. In addition to the enforcement of protective legislation, the establishment of natural reserves for sea turtles is highly desirable.

The sea turtles of the Western Indian Ocean comprise 2 families, 5 genera and 5 species.

### GUIDE TO FAMILIES AND GENERA OCCURRING IN THE AREA

#### FAMILY CHELONIDAE

#### CHEL

Shell, head and flippers covered with horny lamellae (scutes); horny beak never W-shaped when viewed from the front; flippers with 1 or 2 claws.

**KEY TO GENERA OCCURRING IN THE AREA:**

- 1a. Horny scutes on carapace imbricated (overlapping in all except very old specimens) (Figs 1b and 1c) ..... Eretmochelys
- 1b. Horny scutes on carapace juxtaposed (not imbricated)
  - 2a. Four pairs of lateral (costal) scutes on carapace (Fig.2c); edge of lower jaw coarsely toothed (Fig.2b); a single pair of prefrontal scutes (Fig.2a); a single pair of claws on flippera.. ..... Chelonia
  - 2b. Five or more pairs of lateral (costal) scutes on carapace (Figs 3a and 4a); 2 claws on each flipper
    - 3a. Four pairs of inframarginal scutes on the bridge of the plastron, each with a small perforation or pore toward their hind margin (Fig.3c); carapace semicircular (F ig.3b) ..... Lepidochelys
    - 3b. Three pairs of enlarged inframarginal scutes without pores on the bridge of the plastron (Fig.4c); carapace heart-shaped (Fig.4b) ..... Caretta

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which identification Sheets are included

<u>Caretta caretta gigas</u> (Deraniyagala, 1939)	CHEL Car 1
<u>Chelonia mydas agassizii</u> (Bocourt, 1868)	CHEL Chel 1
<u>Eretmochelys imbricata bissa</u> (Rüppell, 1835)	CHEL Eret 1
<u>Lepidochelys olivacea</u> (Eschscholtz, 1829)	CHEL Lepid 2

**FAMILY DERMOCHELIDAE**

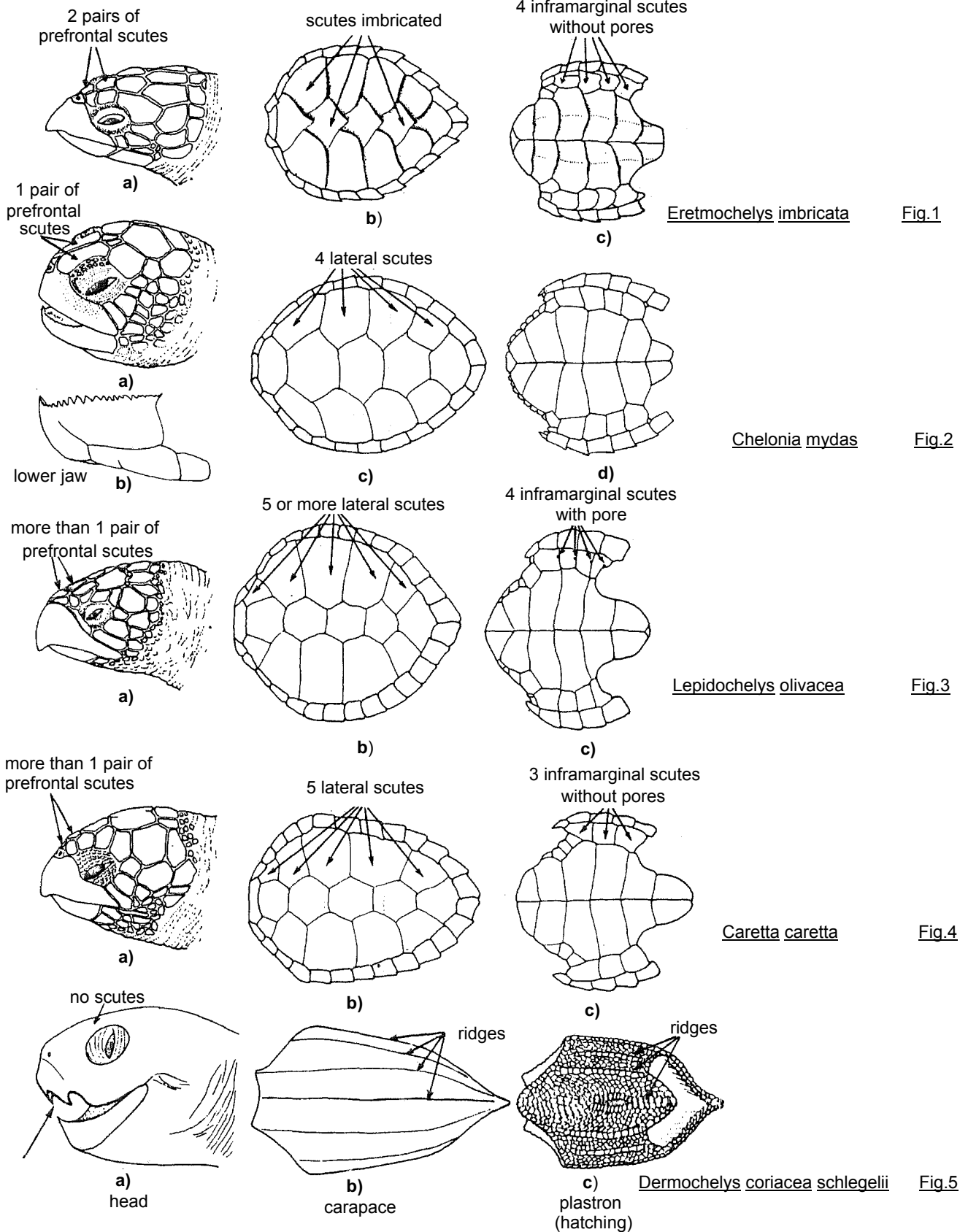
**DERMO**

Horny skin smooth, scuteless; carapace black with 7 narrow longitudinal ridges (Fig.5b), white dotted plastron with 5 longitudinal ridges (Fig.5c); upper jaw with a well-defined cusp on each side, giving the horny beak a W-shaped appearance when viewed from the front (Fig.5a); large flippers without claws, the anterior pair much bigger, the posterior broadly connected with the tail by a web in adults.

A single species occurring in the area:

<u>Dermochelys coriacea schlegelii</u> (Garman, 1884)	DERMO Dermo 1
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PICTURE GUIDE TO SPECIES OCCURRING IN THE AREA

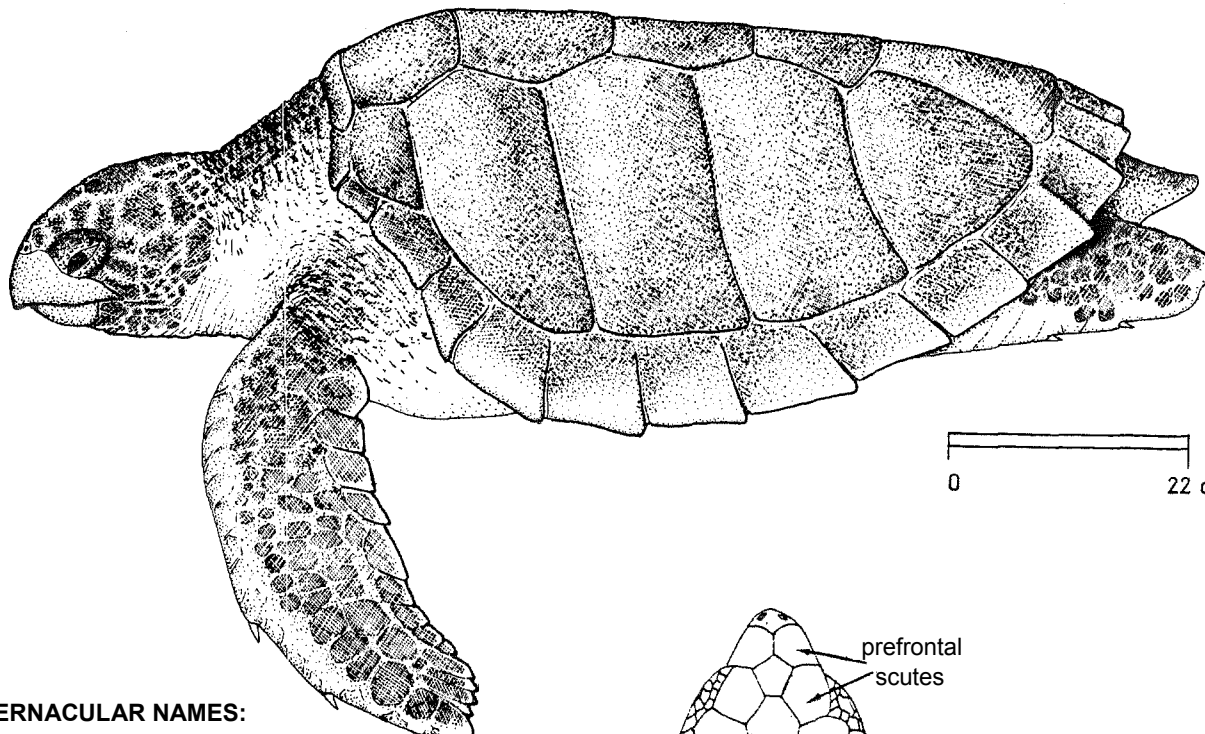


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CHELONIDAE

FISHING AREA 51  
(W. Indian Ocean)*Caretta caretta gigas* (Deraniyagala, 1939)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Pacific loggerhead turtle  
                   Fr - Tortue caouane du Pacifique  
                   Sp - Tortuga cahuama del Pacifico

NATIONAL:

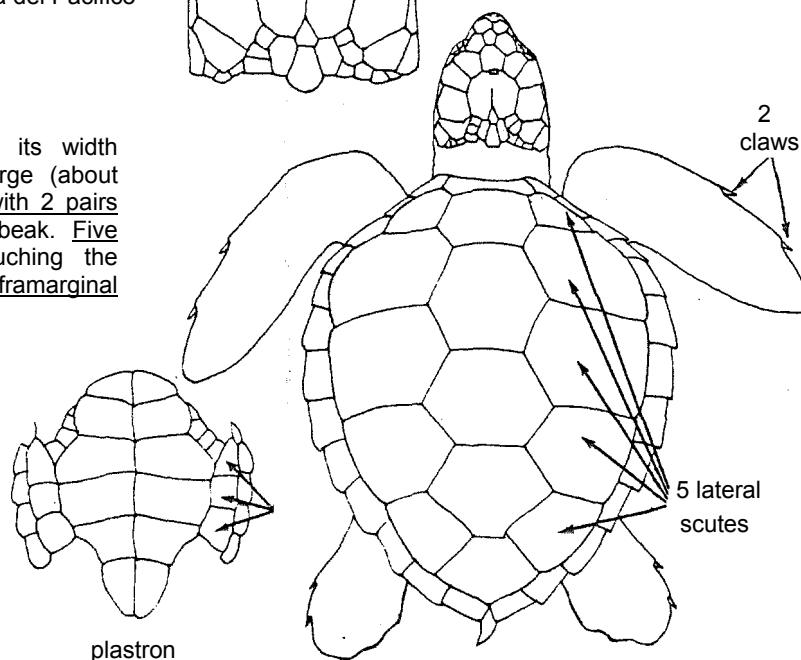
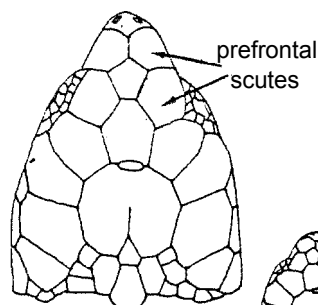
## DISTINCTIVE CHARACTERS:

Carapace heart-shaped, depressed, its width about 76% of the length. Head rather large (about 28% of carapace length) and very broad, with 2 pairs of prefrontal scutes and a strong horny beak. Five pairs of lateral scutes, anterior pair touching the precentral scute; 3 pairs of enlarged inframarginal scutes on plastron; 2 claws on each flipper.

Colour: upper side brownish red with light spots; underside pale yellow with diffuse orange spots.

Eggs: white, spherical, about 4.3 cm in diameter and 36 g in weight.

Hatchlings: length of carapace about 4.5 cm. Colour dark brown with light margins, except for the keels of the plastron which are lighter.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other sea turtles with horny scutes on shell: head narrower, carapace broader (except *Eretmochelys imbricata* which is easily distinguished by its imbricated scales); 4 inframarginal plates on plastron (3 in *Caretta caretta*); upper side of carapace usually not brownish red.

## SIZE:

Carapace length (straight-line distance): maximum to 125 cm; common to 110 cm.

Weight: maximum to 150 kg; common to 105 kg.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Throughout most of the area, principally in the Red Sea, the Gulf of Aden, the "Gulf" and the Gulf of Oman, south and west coasts of India, west coast of Mozambique channel and south of Madagascar.

Found entering streams of brackish water, but also encountered in the open sea and around islands. It is known to be a highly migratory species. The nesting areas are found on the east coasts of Yemen and Oman, and in the Gulf of Manaar, secondary nesting activities take place in Mozambique, Natal (South Africa) and the southern part of Madagascar. Mating takes place before the nesting season, oviposition from November to January; the incubation period ranges from 50 to 65 days. Nowadays the nesting activity is scarce throughout Area 51, except in Masira Island, in Oman (30 000 turtles in 1979) and East Yemen (1 000 to 2 500 turtles per year).

Predominantly carnivorous, feeding on molluscs, crustaceans, fish and jellyfish.

## PRESENT FISHING GROUNDS:

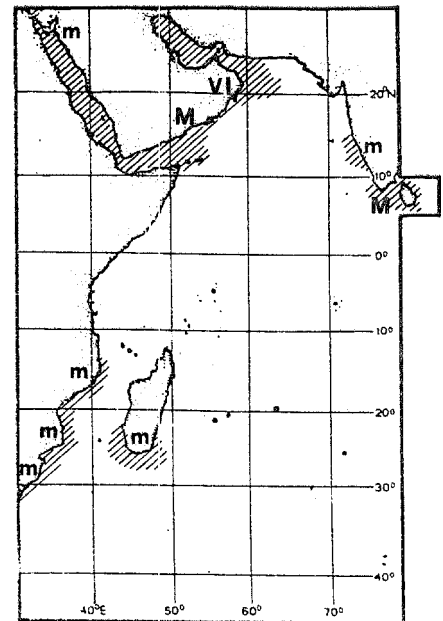
Mainly on the south coast of Madagascar and in the Gulf of Aden.

## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species. Around 180 t are estimated to be caught annually on the southwest side of Fishing Area 51.

At sea it is caught mainly with tangle nets, seines, harpoons and by trawling. On beaches it is taken simply by turning the animals on their backs.

The flesh of this turtle is reported to be a regular item in the diet of the coastal population, especially on the southern coast of Madagascar. The eggs are consumed in Oman, Sri Lanka and Natal and they are considered a delicacy; the meat is tasty, but somewhat tough; the flippers and other parts are used for soup. Protection of this species should be enforced at least for limited periods, especially in Masira where the catch is illegal.



### NESTING IMPORTANCE

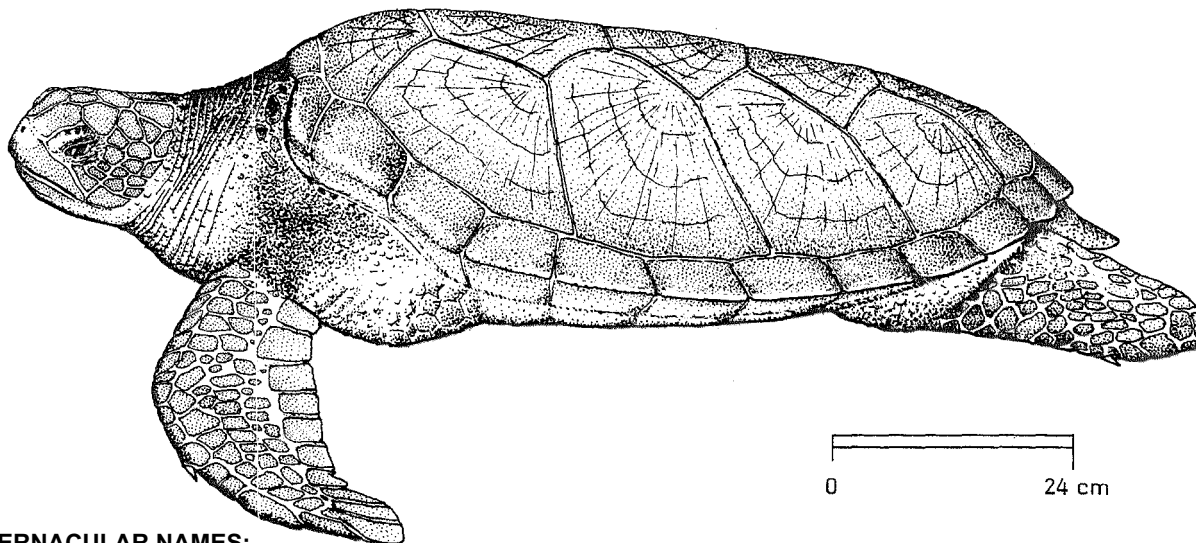
- UQ** - unspecified quantity, less than 100 individuals
- m** - minor, more than 100 individuals
- M** - good, more than 1 000 individuals
- V.I.** - major, more than 5 000 individuals

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CHELONIDAE

FISHING AREA 51  
(W. Indian Ocean)*Chelonia mydas agassizii* (Bocourt, 1868)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Pacific green sea turtle  
Fr - Tortue verte du Pacifique  
Sp - Tortuga verde del Pacifico

NATIONAL:

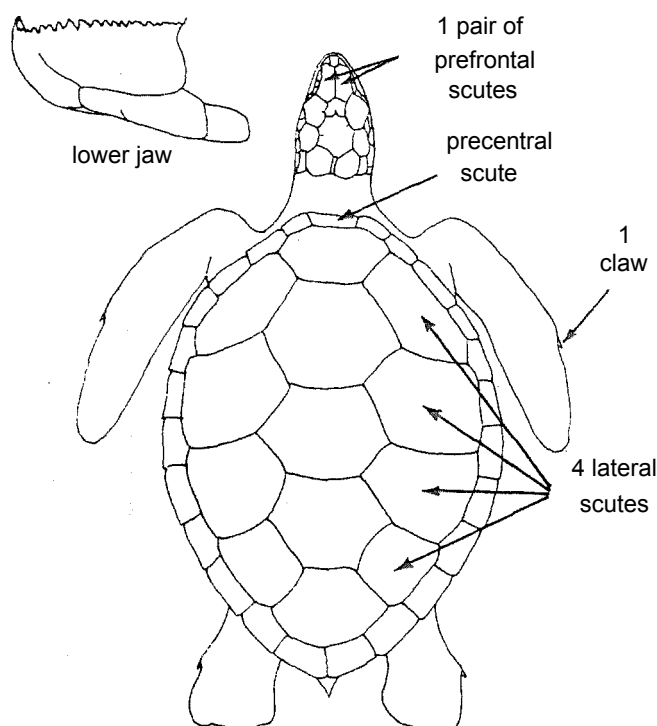
## DISTINCTIVE CHARACTERS:

Carapace oval, depressed, its width about 88% of the length. Head small (about 20% of carapace length), with a single pair of prefrontal scutes; edge of lower jaw coarsely toothed, that of upper jaw with strong ridges on inner surface. Four pairs of lateral scutes on carapace, anterior pair not touching the precentral scute; 4 pairs of inframarginal scutes on plastron; a singles claw on each flipper.

Colour: upper side dark olive brown or black, scutes of carapace shiny with radiating yellow, green and black spots; underside pale grey or whitish.

Eggs: white, spherical, about 4.5 cm in diameter, and 38 g in weight.

Hatchlings: length of carapace about 5 cm. Upper side brownish black, posterior portion of carapace and flippers with a white margin; underside of neck, body and flippers yellowish white.



## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other sea turtles with horny scutes on shell: edges of jaws smooth and more than one pair of prefrontal scutes; also, scutes on shell imbricated in *Eretmochelys imbricata* and 5 or more lateral scutes in the remaining species (4 lateral scutes in *C. mydas*).

## SIZE:

Carapace length (straight-line distance): maximum to 120 cm; common to 80 cm.

Weight: maximum to 140 kg; common to 75 kg.

## GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Throughout most of the area, southward to 25° S, especially around islands, in the Mozambique Channel, Gulf of Oman, the "Gulf" and the Gulf of Aden. Other subspecies of green turtle are found in the Atlantic and in the Eastern and Central Pacific Oceans.

The optimum habitat is shoal water with an abundance of submerged vegetation (sea grass), but straggling individuals may be seen at considerable distances from land, and larger agglomerations are found on small mid-sea islands. The main nesting areas are located on the islands of Mauritius, Europa, Aldabra, Comoro and Seychelles. Other important beaches for nesting are in Oman, Pakistan and Gujarat (northwest India). Mating takes place in July and oviposition principally from July to November; the incubation period varies with latitude, ranging from 50 to 65 days.

Adult green turtles are primarily herbivorous, feeding on several species of sea grass, but they are not adverse to eating animals; captive green turtles accept pelleted or animal food.

## PRESENT FISHING GROUNDS:

Throughout the area, but especially around islands. Small fisheries operate the year round in western Madagascar, on the southwest coasts of India and Sri Lanka, in the Democratic Republic of Yemen, Somalia and Kenya.

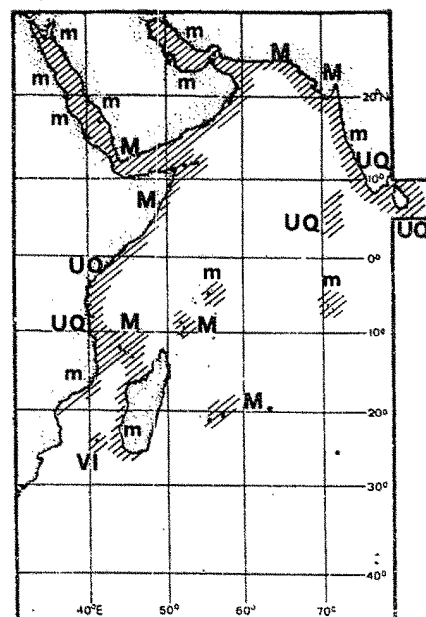
## CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species, but the total annual catch for Fishing Area 51 is estimated at around 1 800 t.

At sea it is mainly caught with tangle nets, seines and harpoons. On the nesting grounds, adult females are simply turned on their backs. The incidental catch by trawling has heavy incidence on the populations.

The flesh is marketed fresh locally. Also utilized in the preparation of subproducts such as oil, calipee and leather.

Since the population has been heavily depleted as a result of irrational exploitation, several countries in the area have adopted regulatory measures ranging from partial to full protection of eggs and adult females (especially Aldabra Island where full protection of turtles and their eggs has been enforced). On the islands of Europa and Mauritius more protection is needed and this is also true for other major nesting beaches on the mainland.



### NESTING IMPORTANCE

**UQ** - unspecified quantity, less than 100 individuals

**m** - minor, more than 100 individuals

**M** - good, more than 1 000 individuals

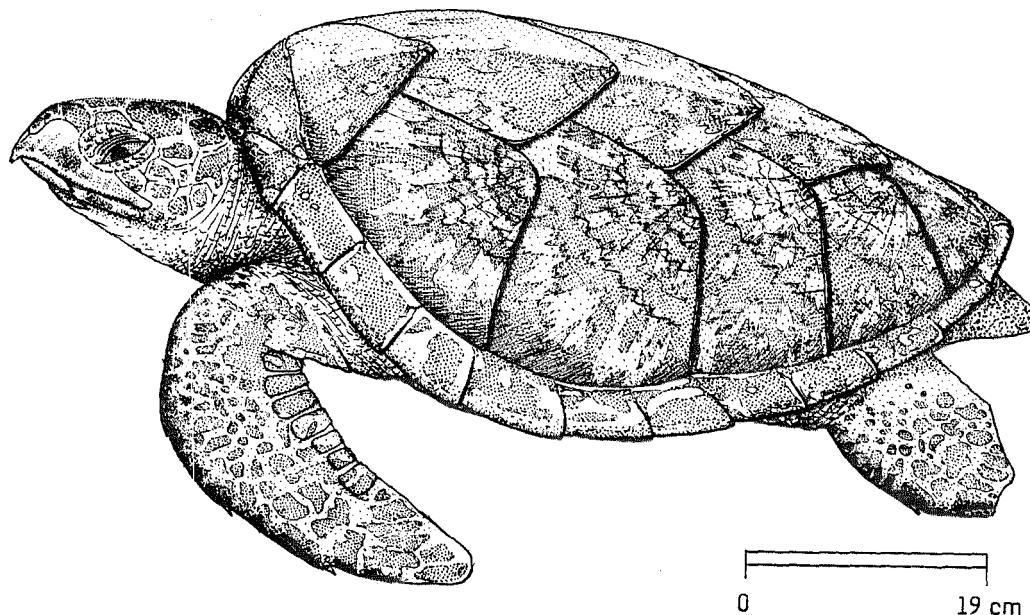
**V.I.** - major, more than 5 000 individuals

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CHELONIDAE

FISHING AREA 51  
(W. Indian Ocean)*Eretmochelys imbricata* *bissa* (Rüppell, 1835)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO : En - Pacific hawksbill turtle  
Fr - Tortue caret du Pacifique  
Sp - Tortuga de carey del Pacifico

NATIONAL:

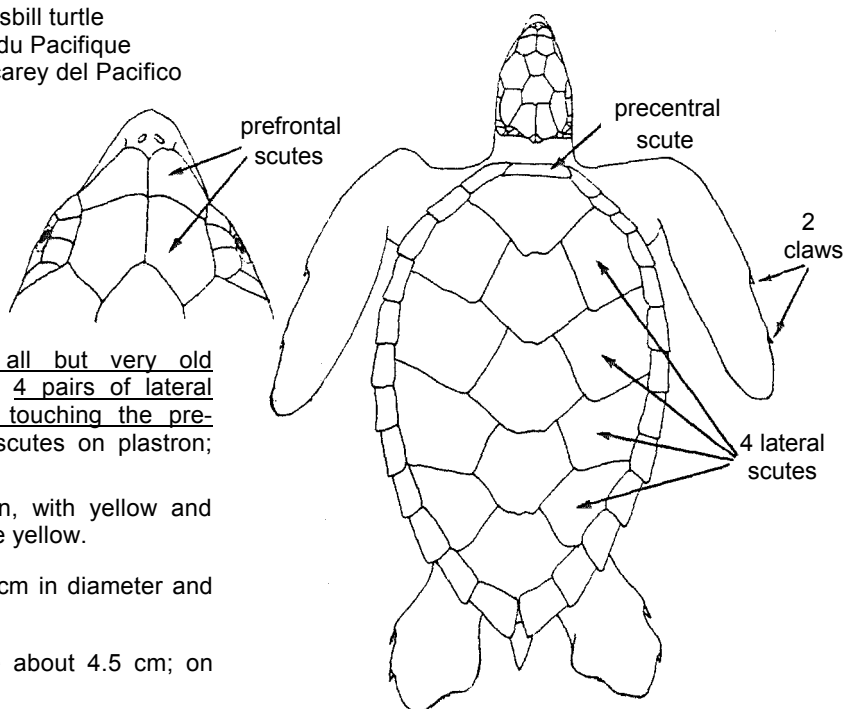
## DISTINCTIVE CHARACTERS:

Carapace oval, depressed, its width about 75% of the length. Head medium-sized (about 27% of carapace length), with 2 pairs of prefrontal scutes and a strong horny beak. Scutes on shell imbricated (overlapping in all but very old specimens where they are juxtaposed; 4 pairs of lateral scutes an carapace, anterior pair not touching the precentral scute; 4 pairs of inframarginal scutes on plastron; 2 claws on each flipper.

Colour: upper side dark brown, with yellow and reddish streaks on scutes; underside pale yellow.

Eggs: white, spherical, 3.5 to 4 cm in diameter and 28 g in weight.

Hatchlings: length of carapace about 4.5 cm; on both sides colour dark brown.





## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

No other adult sea turtle from this area has imbricated scutes on carapace or plastron; the only other species with 4 lateral scutes on the carapace is *Chelonia mydas*, but the carapace is much broader, the flippers bear a single claw and the lower jaw is roughly toothed (longer and smooth in *E. imbricata*).

### SIZE:

Carapace length (straight-line distance): maximum to 100 cm; common to 80 cm.

Weight: maximum to 100 kg; common to 60 kg.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Found practically throughout the area, especially around off-lying islands, but its occurrence is rather spotty; it is more abundant on the western coast of the area.

Inhabits coastal waters, including shallow vegetated bottoms as well as bays and lagoons with muddy and coralline bottoms lacking extensive beds of submarine vegetation. Nesting is reported from Oman, South Yemen, Sudan, Iran, Maldives, Chagos, Seychelles, Aldabra and Madagascar. Mating is documented to take place from July to August and oviposition from September to February; the incubation period ranges from 45 to 60 days.

The hawksbill turtle is an omnivorous species; its diet includes jellyfish, sponges, sea urchins, crustaceans, molluscs, seaweeds and seagrass.

### PRESENT FISHING GROUNDS:

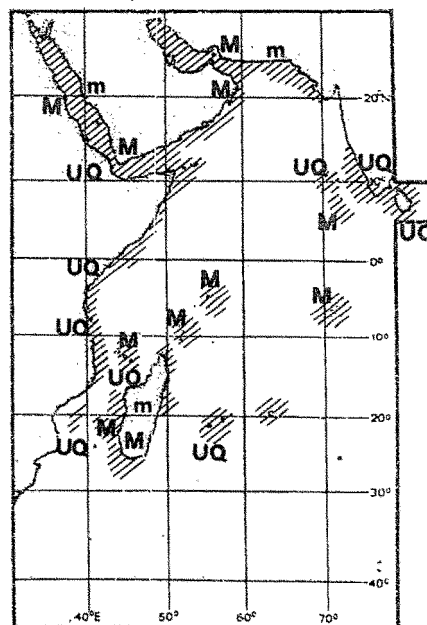
Traditional fishing grounds are located around coral islands or along rocky coasts; presently caught mainly off Madagascar, Somalia, Kenya, Mozambique, Tanzania and on the Maldives, Comoros, Mauritius and Chagos Islands.

### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species, but the total annual catch estimated for the area exceeds 600 t of live turtles and exports of more than 20 t of tortoise shell are reported.

At sea it is mainly caught with tangle nets, seines and harpoons; also by scuba-diving, remora-fishing and trawling.

Marketed fresh in some countries; the meat as well as the eggs are good eating, although in many places the former is not particularly fancied and is reported to be sporadically poisonous (probably as a result of the turtle's diet). The most important product obtained from this species is the tortoise-shell or carey which is widely used in artisanal work and raw material is exported principally to Japan. Complete protection measures for this species are highly desirable.



#### NESTING IMPORTANCE

- UQ** - unspecified quantity, less than 100 individuals
- m** - minor, more than 100 individuals
- M** - good, more than 1 000 individuals
- V.I.** - major, more than 5 000 individuals

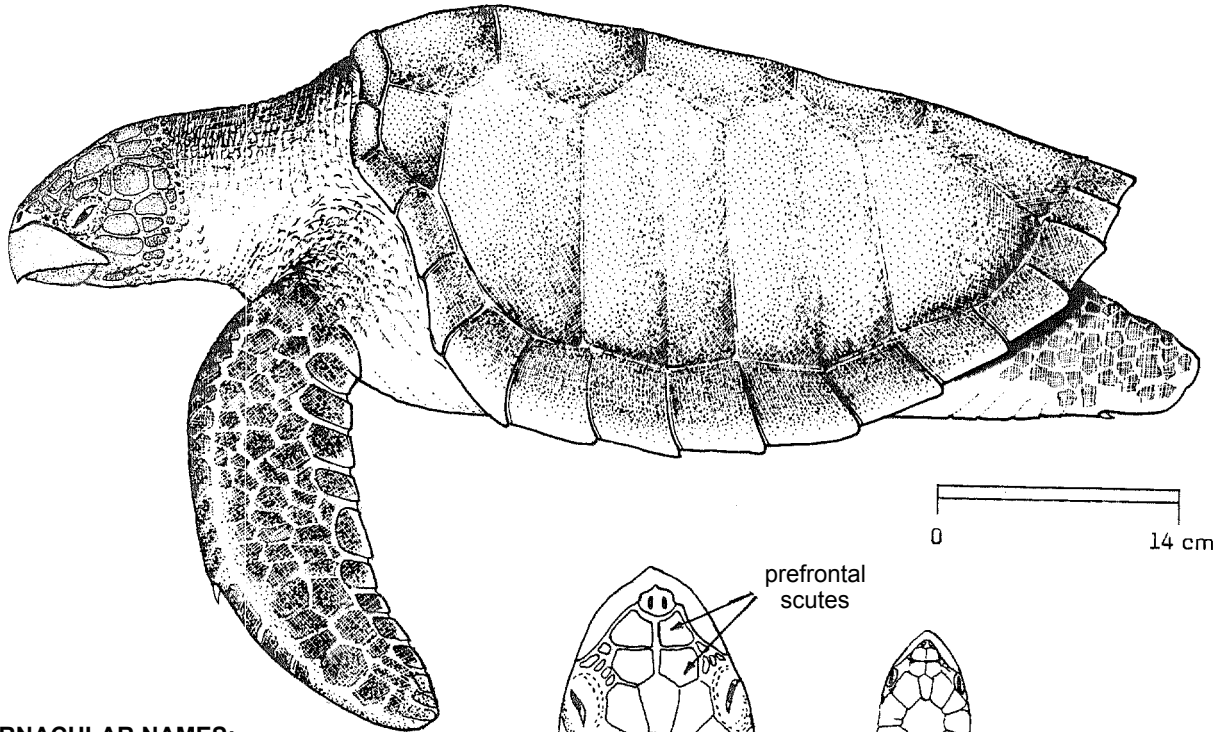
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: CHELONIDAE

FISHING AREA 51  
(W. Indian Ocean)

*Lepidochelys olivacea* (Eschscholtz, 1829)

OTHER SCIENTIFIC NAMES STILL IN USE: None



VERNACULAR NAMES:

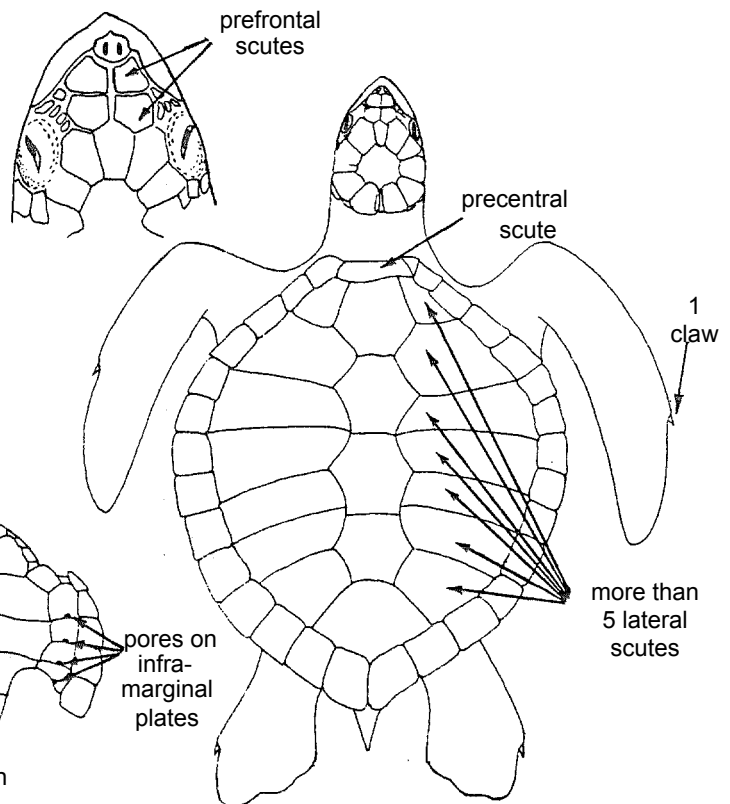
FAO : En - Pacific ridley turtle  
Fr - Tortue ridley du Pacifique  
Sp - Tortuga golfina

NATIONAL :

DISTINCTIVE CHARACTERS:

Carapace semicircular in outline, depressed, its width about 90% of the length. Head small (about 22% of carapace length) with 2 pairs of prefrontal scutes and a horny beak which may be finely serrated. Usually more than 5 pairs (sometimes even 7) of lateral scutes on carapace, anterior pair touching the precentral scute; 4 pairs of inframarginal scutes, each perforated by a pore toward its hind margin; adults with only 1 visible claw on each flipper.

Colour: upper side olive brown; underside yellowish white.



Eggs: white, spherical, about 3.9 cm in diameter and 33 g in weight.

Hatchlings: length of carapace about 4 cm; shell with 3 longitudinal ridges above and 2 below; scutes slightly imbricated. Both sides of the body are dark greyish to black; some individuals with yellow margins to the shell.

#### DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

No other turtle species occurring in the area has clearly visible pores on the inframarginal scutes, a nearly circular dorsally flattened carapace and olive coloration.

#### SIZE:

Carapace length (straight-line distance): maximum to 76 cm; common to 70 cm.

Weight: maximum to 52 kg; common to 45 kg.

#### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

Within the area, this turtle is apparently less abundant than the other members of the family Cheloniidae; but it is probably often confused with young loggerheads (*Carette*). It occurs in the western part of the area, especially between Kenya and Mozambique, the west coast of Madagascar, Réunion and Mauritius Islands and in the north between Oman and Sri Lanka.

Found in shallow coastal waters as well as in the open sea forming "flotillas". The most important nesting areas are found on the coasts of Pakistan and slightly south of the west Indian border; other important nesting beaches exist in northern Mozambique and on the southwest coast of Madagascar. The major nesting beaches for this species are outside the area, on the northeast coast of India, Orissa District. Oviposition takes place from August to December; the incubation period ranges from 45 to 65 days, depending upon the latitude.

#### PRESENT FISHING GROUNDS:

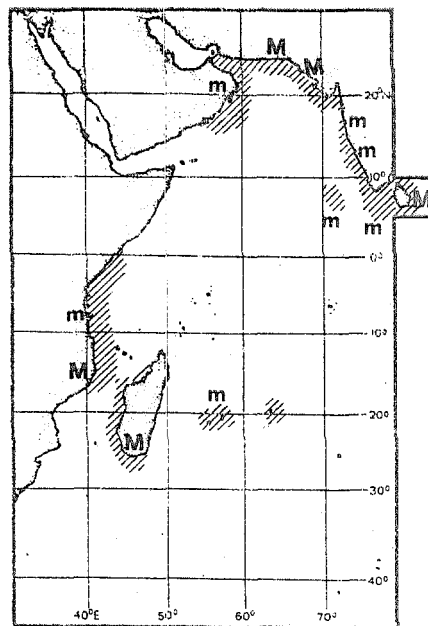
Gulf of Manaar and Pakistan.

#### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species, but reports from fisheries indicate an annual catch of about 130 t.

Apparently taken in small numbers in the nesting area, usually by turning the animals on their backs during oviposition. At sea it is caught incidentally by shrimp trawlers.

The flesh and eggs are marketed locally; the skin has export value.



#### NESTING IMPORTANCE

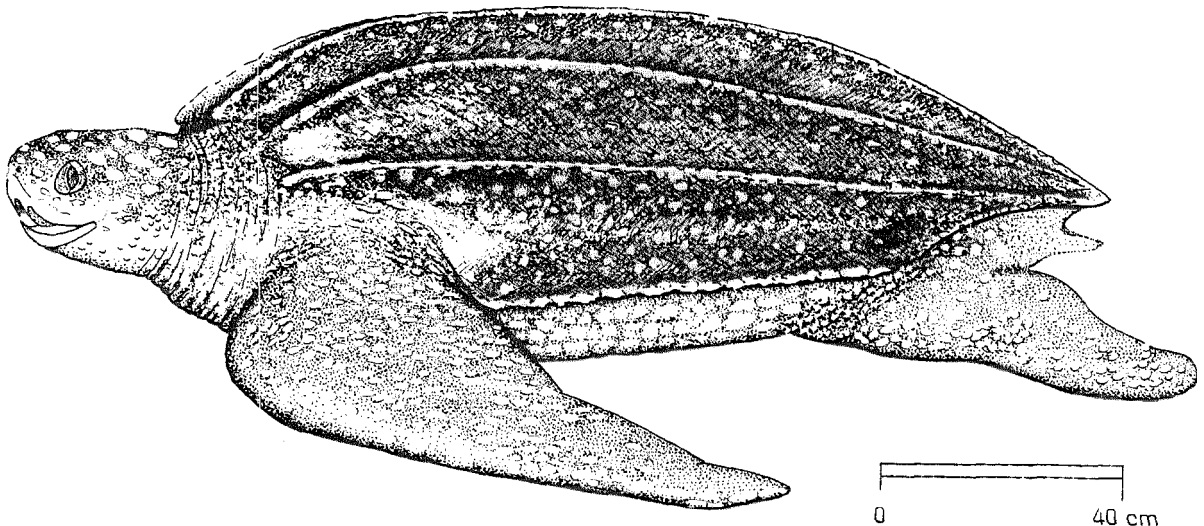
- UQ - unspecified quantity, less than 100 individuals
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- M - good, more than 1 000 individuals
- V.I. - major, more than 5 000 individuals

## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: DERMOCHELIDAE

FISHING AREA 51  
(W. Indian Ocean)*Dermochelys coriacea schlegelii* (Garman, 1884)

OTHER SCIENTIFIC NAMES STILL IN USE: None



## VERNACULAR NAMES:

FAO :           En - Pacific leatherback turtle  
                   Fr - Tortue luth du Pacifique  
                   Sp - Tortuga laúd del Pacifico

NATIONAL :

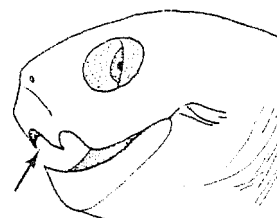
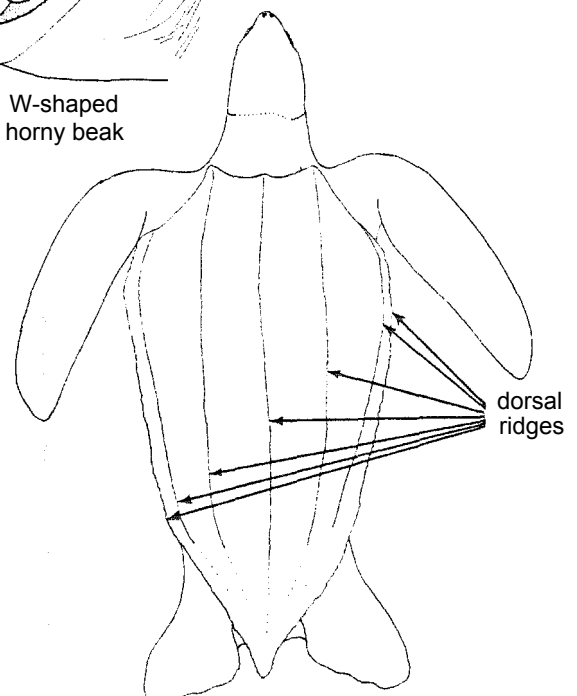
## DISTINCTIVE CHARACTERS:

Body depressed and covered by a smooth leathery skin lacking lamellae or scutes. Head small, ending in a horny beak with a well defined cusp at each side of upper jaw and a central cusp on lower jaw (beak W-shaped when viewed from the front). Seven longitudinal ridges (including the outer or lateral pair) on carapace and 5 on plastron. Flippers very large, without claws.

Colour: upper side dark brown to almost black; whitish spots on neck, increasing in number on the ventral and caudal areas. Underside pink and white.

Eggs: white, spherical, normally about 5.5 cm in diameter and 75 g in weight; the proportion of unfertilized small eggs may often be high.

Hatchlings: length of carapace about 6.0 cm. They show basically the same features as the adult, but the flippers are much larger and the skin is rugose with a reticulate pattern of small scales. Upper side black, with central and lateral ridge, white; underside white, mottled with light brown and black.

W-shaped  
horny beak

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

All other sea turtles occurring in the area have horny lamellae or scutes all over their body and adults lack the longitudinal ridges on carapace and plastron.

### SIZE:

Carapace length (straight-line distance): maximum to 180 cm; common to 140 cm.

Weight: maximum to 725 kg; common to 200 kg.

### GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:

This is clearly the least abundant sea turtle in the area; it is present from Natal to the Tanzanian border, in Oman and the "Gulf" and on the southwest coast of India and Sri Lanka.

Predominantly pelagic and highly migratory, usually found in the open sea, but approaching the land seasonally. The most important nesting beaches are found outside the area on the eastern part of the Malayan peninsula (Trengganu); oviposition takes place from October to February; the incubation period ranges from 60 to 70 days.

### PRESENT FISHING GROUNDS:

Caught in small quantities throughout its range; normally rather scarce, except in certain areas during the nesting season.

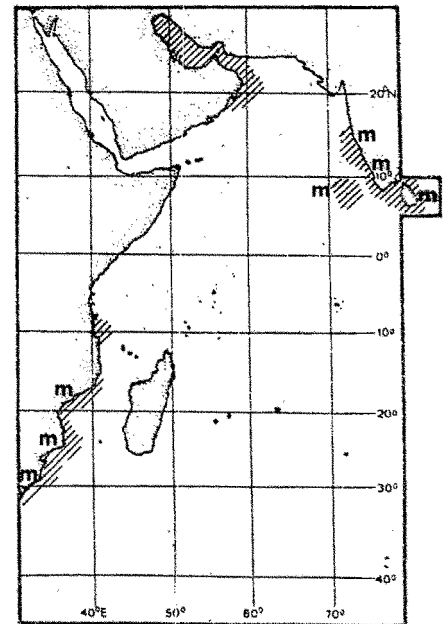
### CATCHES, FISHING GEAR AND FORMS OF UTILIZATION:

Separate statistics are not reported for this species. It is estimated that around 10 t of leatherback turtles are caught annually in the Western Indian Ocean.

At sea it is caught mainly with tangle nets and harpoons; sometimes also taken on the nesting areas.

The meat is usually not esteemed and used mainly for bait, but the eggs are good-eating; the fat and other parts are made into oil used as boat paint cure.

The capture of this species is restricted by law in most countries of the area, due to the depletion of the stock in recent years. In some parts of the area, the species is unknown.



NESTING IMPORTANCE	
UQ	- unspecified quantity, less than 100 individuals
m	- minor, more than 100 individuals
M	- good, more than 1 000 individuals
V.I.	- major, more than 5 000 individuals