

BIVALVES

Class Bivalvia - pelycepod, clams, oysters, and allies

The relative shortage of rocky substratum on the coast of Namibia offers a restricted habitat range for shellfish that require a rocky substratum. In some areas, however, where rock does occur in the intertidal and subtidal, dense beds of mussels and limpets occur. Mussels are eaten in limited quantities by the coastal population. Limpets, though less utilized, are minced and made into fish cakes. Some sand dwelling bivalves may be abundant along the predominantly sandy coast on Namibia. These molluscs are used for fish bait and for human consumption.

Choromytilus meridionalis Krauss, (1848)

MYTILIDAE

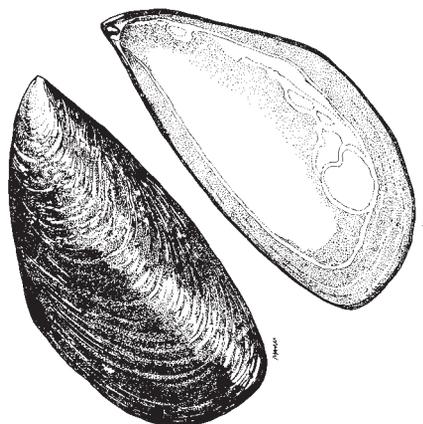
FAO names: En - Black mussel.

Local names:

Size: Maximum length 15 cm.

Utilization: Collected and eaten by coastal populations. Experimentally cultivated near Lüderitz.

Habitat and biology: Common in the cooler southern half of the coast where it forms dense beds on wave exposed rocks in the mid to lower intertidal; also on harbour piles and docks. In the Swakopmund area, *C. meridionalis* occurs higher up the shore as the mid and lower intertidal is usually occupied by another mussel, *Perna perna*.



Perna perna Linnaeus, (1758)

MYTILIDAE

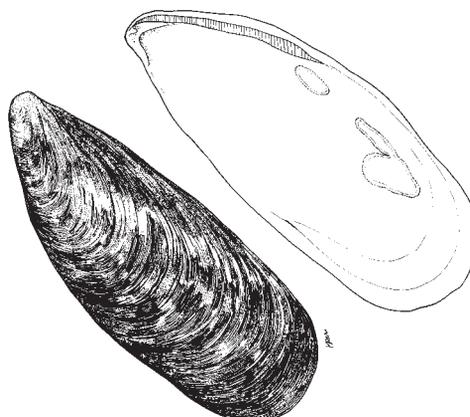
FAO names: En - Perna mussel.

Local names: Brown mussel.

Size: Maximum length 16 cm.

Utilization: Collected and eaten by coastal population.

Habitat and biology: Rare in the southern half of the coast, this warmer water mussel is common in the northern half of the coast and into Angola. Forms dense beds in the lower intertidal and shallow on the wave exposed shores.



GASTROPODS

Class Gastropoda - univalves, conches, whelks, chanks, and allies

Patella argenvillei Krauss (1848)

a large, deep, thick-shelled limpet

PATELLIDAE

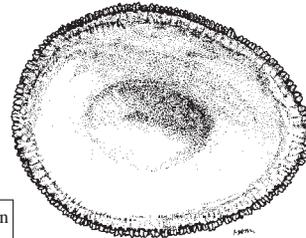
FAO names: En - Argenvill's limpet.

Local names:

Size: Maximum length 10.4 cm.

Utilization: Can be used as fish bait and minced for human consumption.

Habitat and biology: Inhabits wave exposed rocks in a belt at about the low spring tide level. Found in the cooler waters of the southern half of Namibia. Not found from Walvis Bay northwards.



fine ridges on outside of shell often covered with algae

Patella granitina Linnaeus (1758)

exterior of shell has deep ridges giving it a star-like appearance

PATELLIDAE

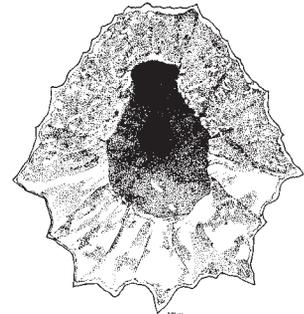
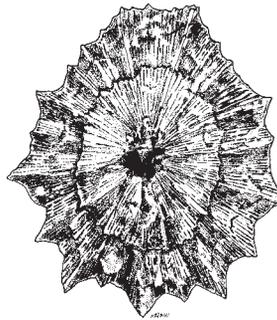
FAO names: En - Granite limpet.

Local names:

Size: Maximum length 8 cm.

Utilization: Can be used as fish bait and minced for human consumption.

Habitat and biology: Occurs in the middle intertidal pools. Common in the cooler southern half of the coast and not common north of Swakopmund. Northern limit thought to be Rocky Point (Kensley and Penrith, 1980).



grey-brown with dark zigzag or chevron markings

Patella granularis Linnaeus (1758)

PATELLIDAE

FAO names: En - Granular limpet.

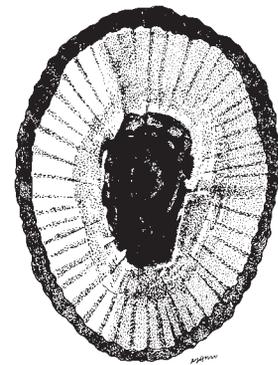
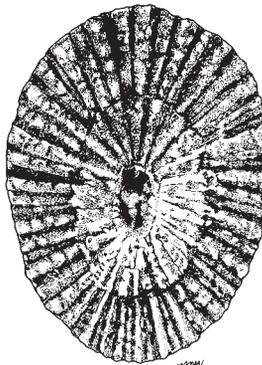
Local names:

Size: Maximum length 6 cm.

Utilization: Can be used as fish bait and minced for human consumption

Habitat and biology: Grows higher up the shore than other limpets, from the middle intertidal to the high spring tide mark. Occurs along the entire coast at least as far north as Cape Frio.

shell with many grooves, deeper than *P. argenvillei* but much shallower than *P. granitina*

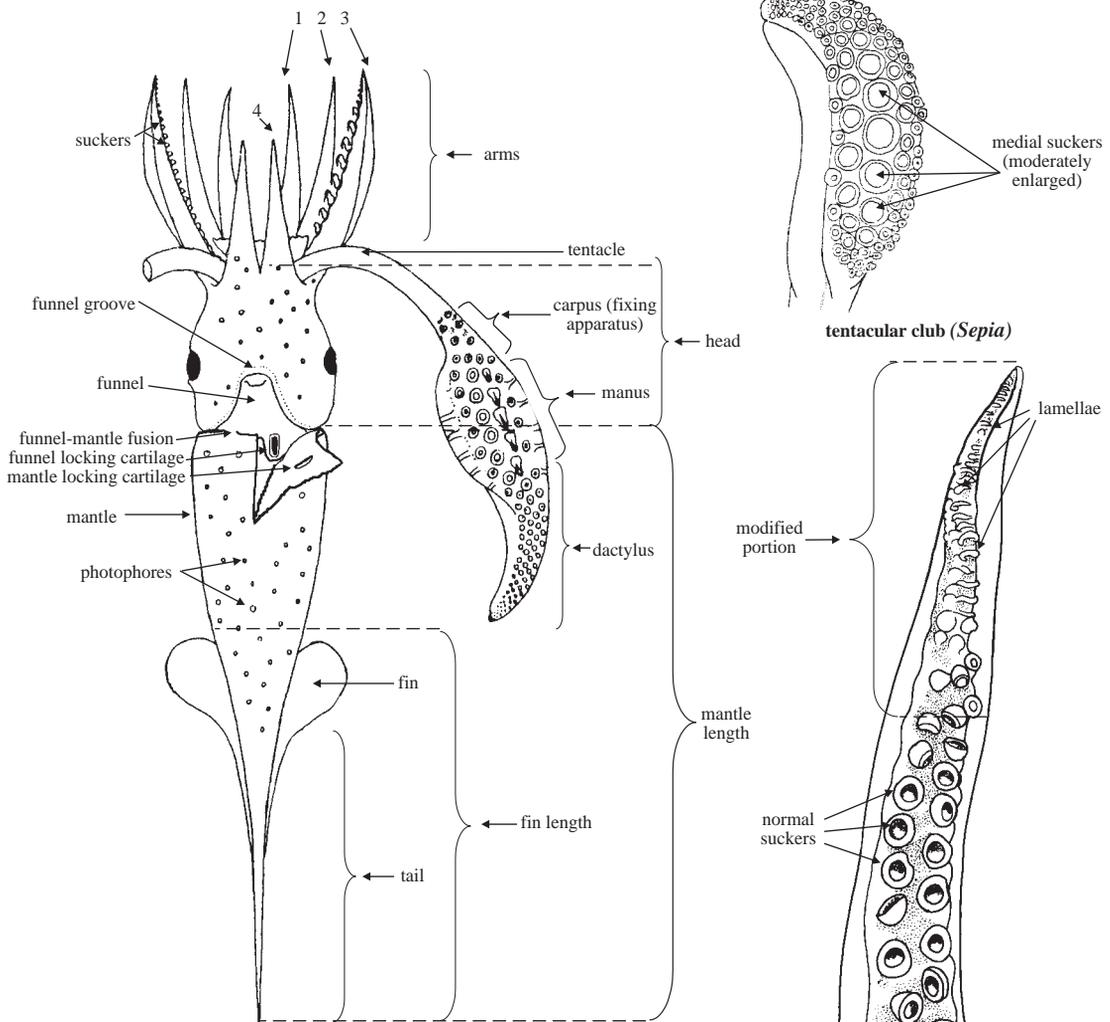


light brown, ribs between grooves covered with light coloured nodules

CEPHALOPODS

As many as 55 species of cephalopods occur in Namibia, according to a recent review by Nesis (1991), but most of these are not presently important in fisheries. Two species, *Todarodes sagittatus angolensis* and *Todaropsis eblanae* are caught incidentally in bottom trawls in the hake fishery in sufficient numbers to be important as bycatch (Wysokinski, 1986). However, cephalopods are a potential resource for further development and may become important in the future. Of the 55 species of cephalopods in 23 families and 4 orders listed from Namibia, we include only 19 species in 8 families in the "Guide to Species." However, in order to allow the interested researcher to identify all cephalopods in Namibia at least to the family level, we include all 23 families in the "Guide to Orders and Families."

TECHNICAL TERMS AND MEASUREMENTS



a composite diagram illustrating basic squid (teuthoid) features

ventral view

example of hectocotylied arm in male (*Illex*)

arm I (dorsal)



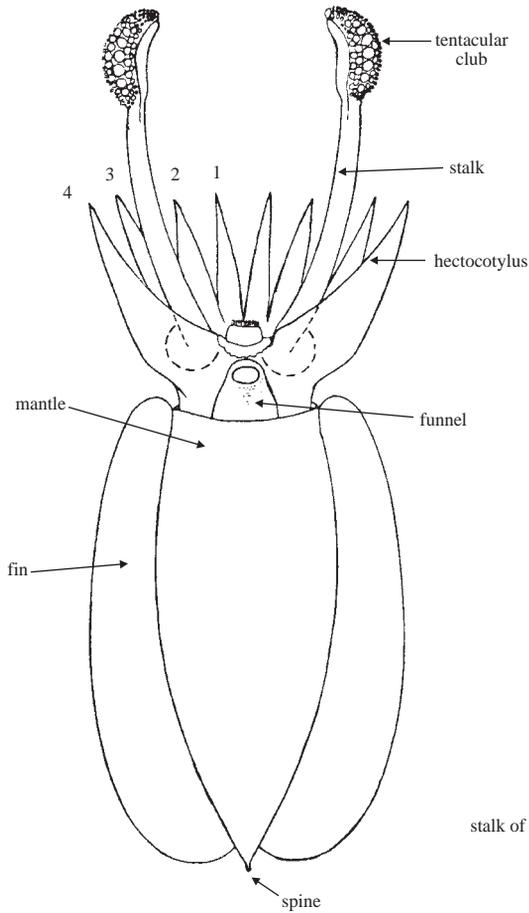
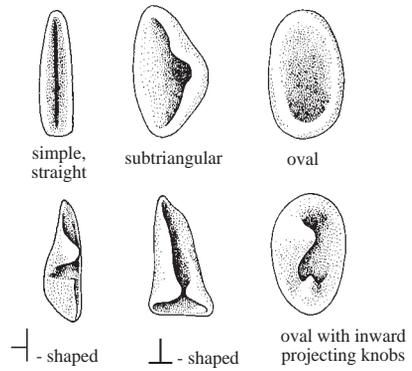


diagram of basic cuttlefish features (ventral view)



basic types of funnel locking cartilage (cartilaginous grooves that lock with corresponding ridges on inner mantle wall to keep base of funnel in position during water expulsion)

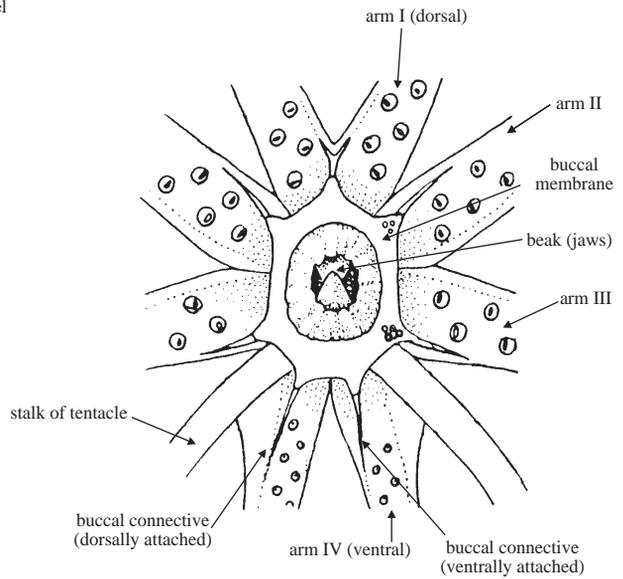
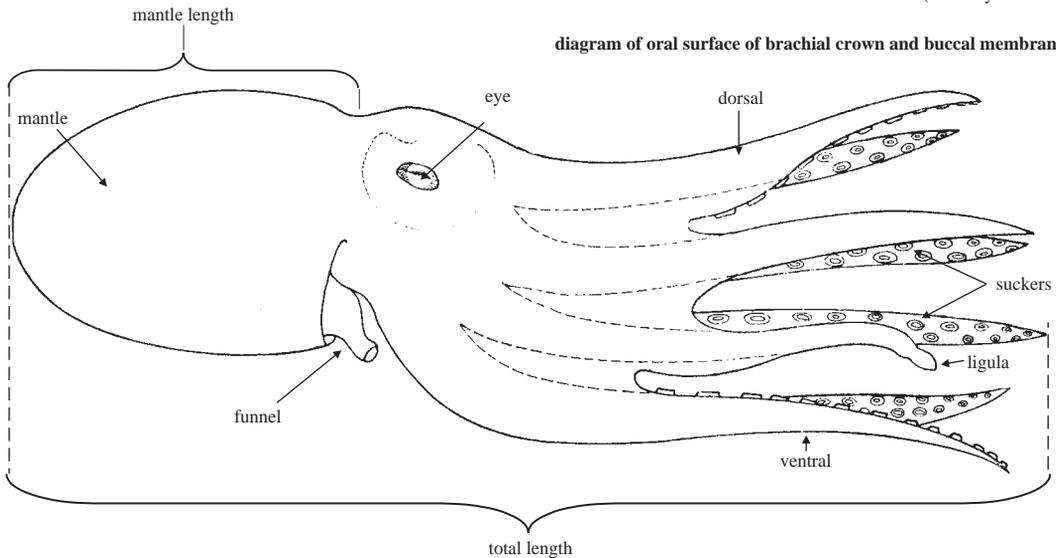


diagram of oral surface of brachial crown and buccal membrane



Order **SEPIOIDEA - Cuttlefish, Ram's Horn Squids, and Bobtailed Squids**
 Appendages around mouth consisting of 8 arms and 2 tentacles; internal shell straight, coiled, and chambered, or straight and rudimentary. Seven species in 3 families so far reported from Namibia.

SPIRULIDAE

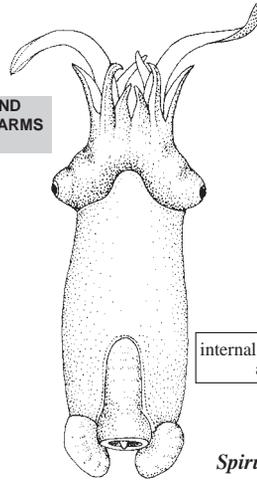
Ram's horn squids

A single species, *Spirula spirula* (Linnaeus, 1758), reported from Namibia; not included in the "Guide to Species." Pelagic to depths of around 100 m; benthic spawner.

10 APPENDAGES AROUND MOUTH CONSISTING OF 8 ARMS AND 2 TENTACLES

INTERNAL SHELL CALCIFIED, CHITINOUS, OR LACKING

INTERNAL SHELL STRAIGHT, COILED, AND CHAMBERED, OR STRAIGHT AND RUDIMENTARY



internal shell calcified, coiled, and chambered

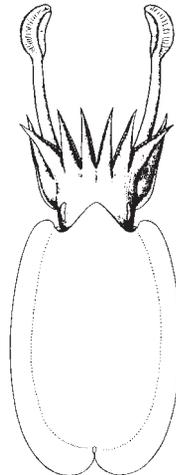
Spirula spirula

dorsal

SEPIIDAE

Cuttlefish

Seven species reported from Namibia, 5 of interest to fisheries and included in the "Guide to Species." All are coastal species and except for *Sepia papillata*, a shallow-water species, generally inhabit depths between 125 and 335 m. *Sepia orbignyana* Férussac, 1876 and *Sepiella ornata* (Rang, 1837) rarely enter northern Namibian waters and are not included in the "Guide to Species."



dorsal view

internal shell calcified, chalky, broad, and straight

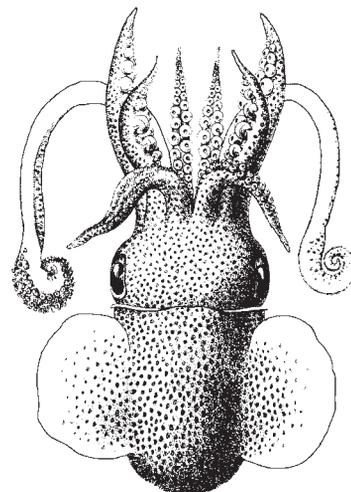


SEPIOLIDAE

Bobtailed squids

Four species: *Neorissa caroli* (Joubin, 1902), *Rondeletiola minor* (Naef, 1912), *Rossia (Austrorossia) enigmatica* Robson, 1924, and *Stoloteuthis leucoptera* (Verrill, 1978) reported from Namibia. Small species, unlikely to be of interest to fisheries; not included in the "Guide to Species."

internal shell chitinous or rudimentary



dorsal view

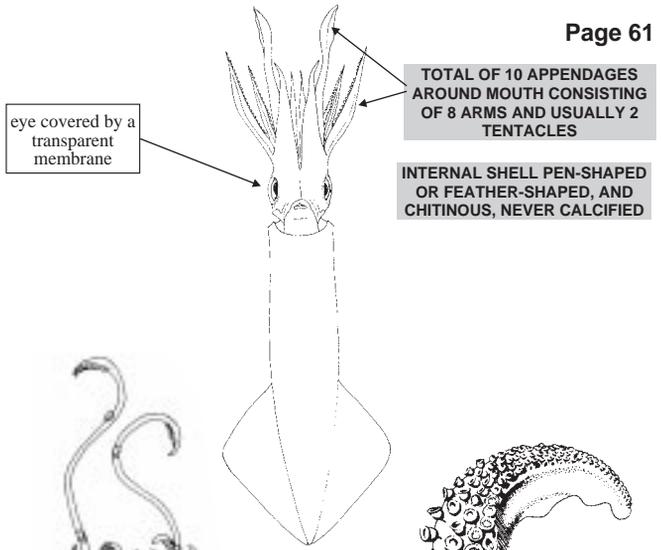
Order TEUTHOIDEA - Inshore and Oceanic Squids

Total of 10 appendages around mouth consisting of 8 arms and usually 2 tentacles; internal shell pen-shaped or feather-shaped, chitinous. About 34 species in 15 families so far reported from Namibia.

LOLIGINIDAE

Inshore squids

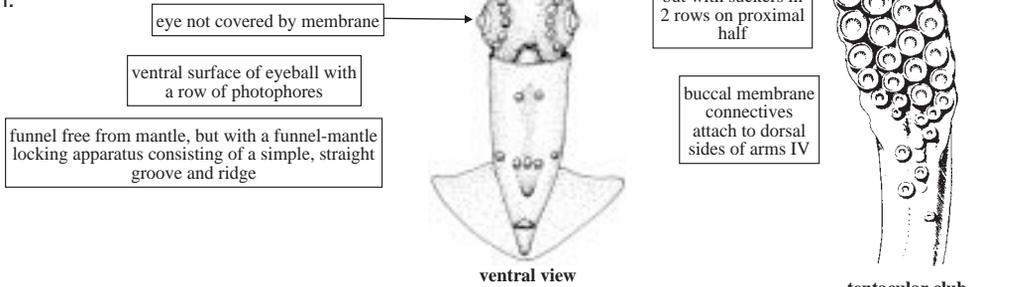
Two species so far reported from Namibia. Neritic, found in shallow water to depths of usually around 300 m.



LYCOTEUTHIDAE

Lycoteuthid squids

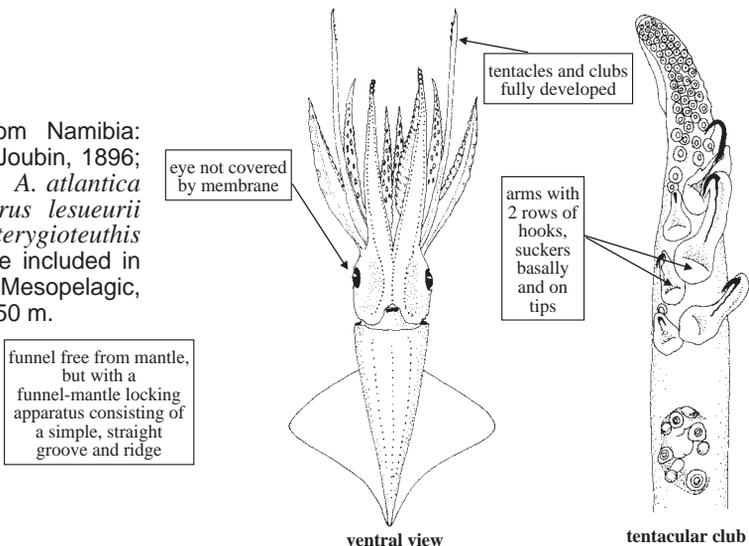
A single species, *Lycoteuthis lorigera* (Steenstrup, 1875) reported from Namibia (*L. diadema* is a junior synonym); not included in the "Guide to Species." Epipelagic, from the surface to a depth of 200 m.



ENOPLOTEUTHIDAE

Enope squids

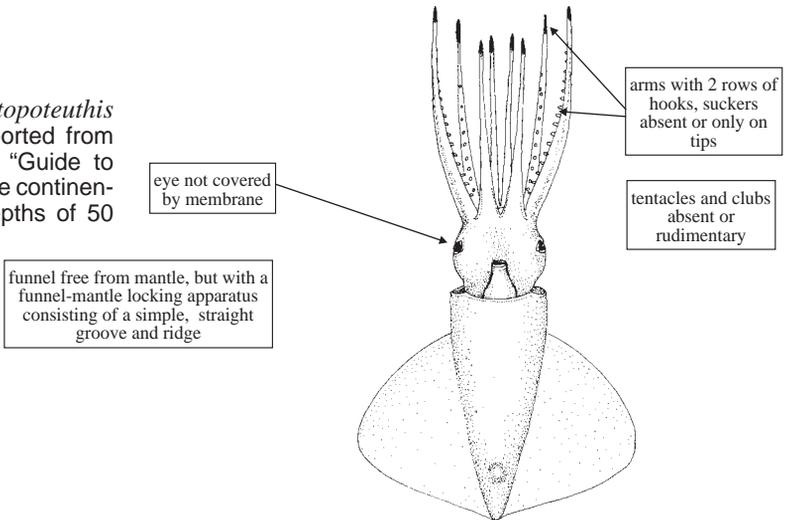
Five species reported from Namibia: *Abraliopsis hoylei pfefferi* Joubin, 1896; *A. gilchristi* Robson, 1924; *A. atlantica* Nesis, 1982; *Ancistrocheirus lesueurii* (d'Orbigny, 1835); *Pterygioteuthis gemmata* Chun, 1908; none included in the "Guide to Species." Mesopelagic, down to depths of around 750 m.



OCTOPOTEUTHIDAE

Octopus squids

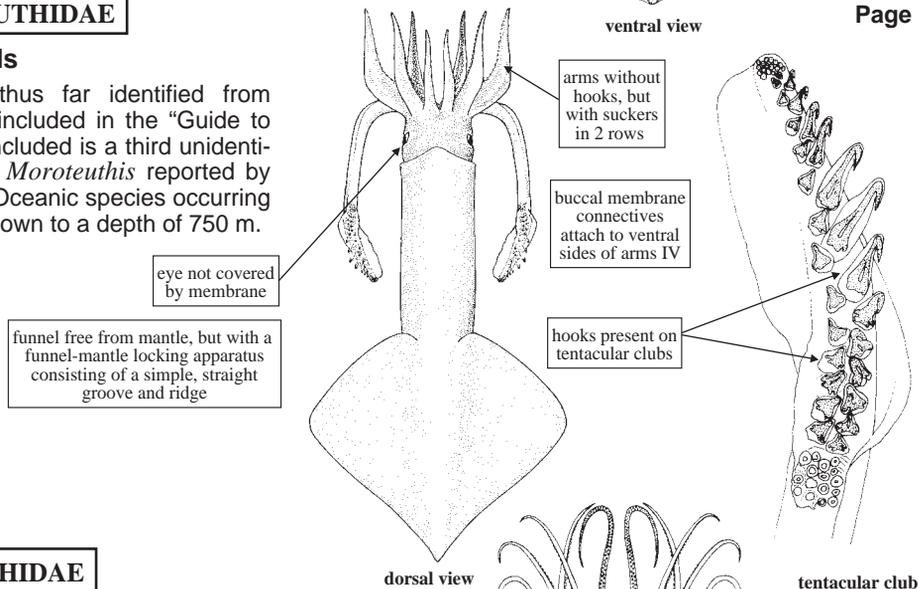
A single species, *Octopoteuthis megaptera* (Verrill, 1885), reported from Namibia; not included in the "Guide to Species." Mesopelagic over the continental slope, usually between depths of 50 and 500 m.



ONYCHOTEUTHIDAE

Hooked squids

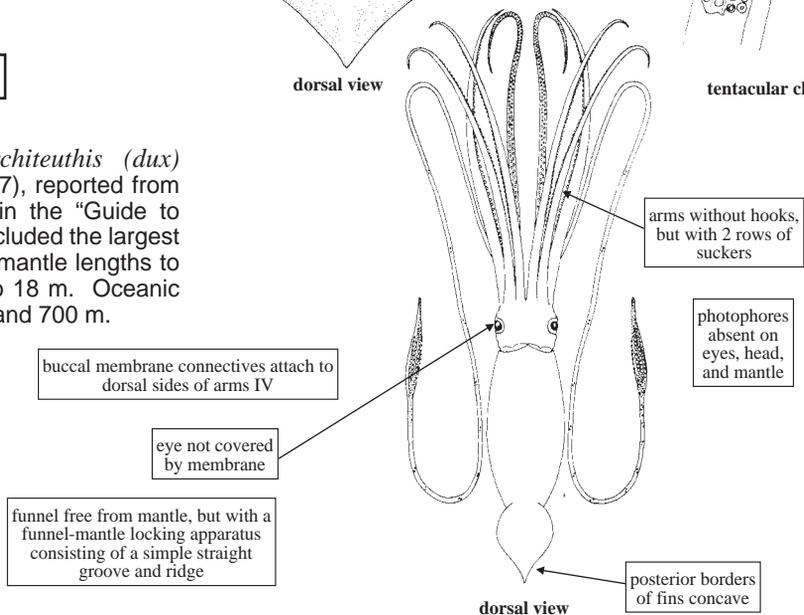
Two species thus far identified from Namibia, both included in the "Guide to Species"; not included is a third unidentified species of *Moroteuthis* reported by Nesis (1991). Oceanic species occurring at the surface down to a depth of 750 m.



ARCHITEUTHIDAE

Giant squids

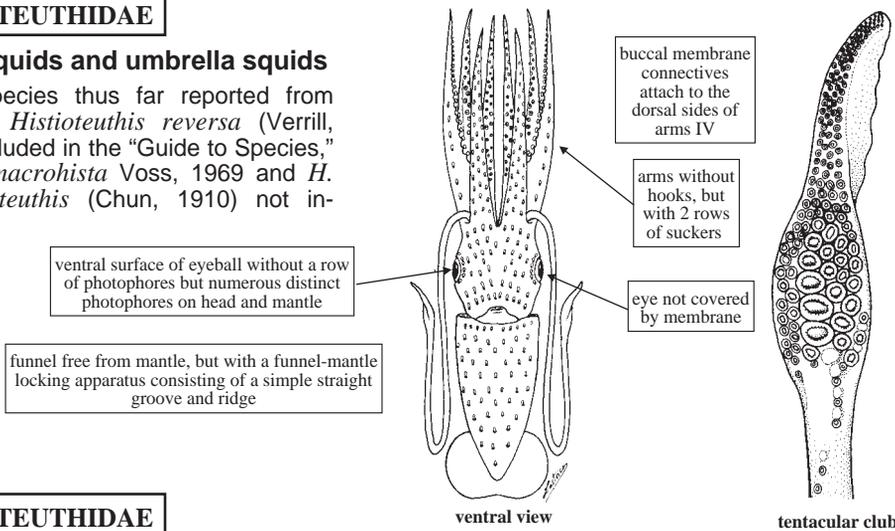
A single species, *Architeuthis (dux) sanctipauli* (Vélain, 1877), reported from Namibia; not included in the "Guide to Species." This family included the largest of all cephalopods with mantle lengths to 5 m and total lengths to 18 m. Oceanic between depths of 200 and 700 m.



HISTIOTEUTHIDAE

Jewell squids and umbrella squids

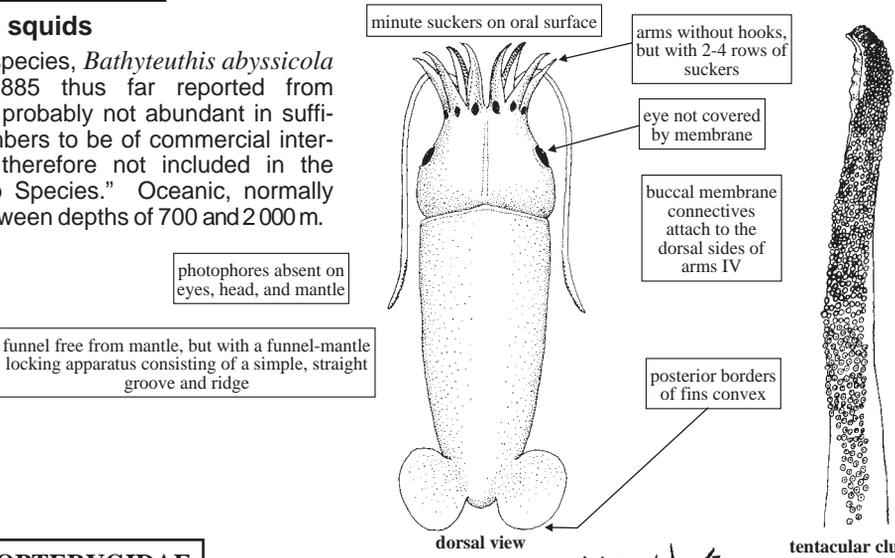
Three species thus far reported from Namibia; *Histioteuthis reversa* (Verrill, 1880) included in the "Guide to Species," and *H. macrohista* Voss, 1969 and *H. meleagroteuthis* (Chun, 1910) not included.



BATHYTEUTHIDAE

Deepsea squids

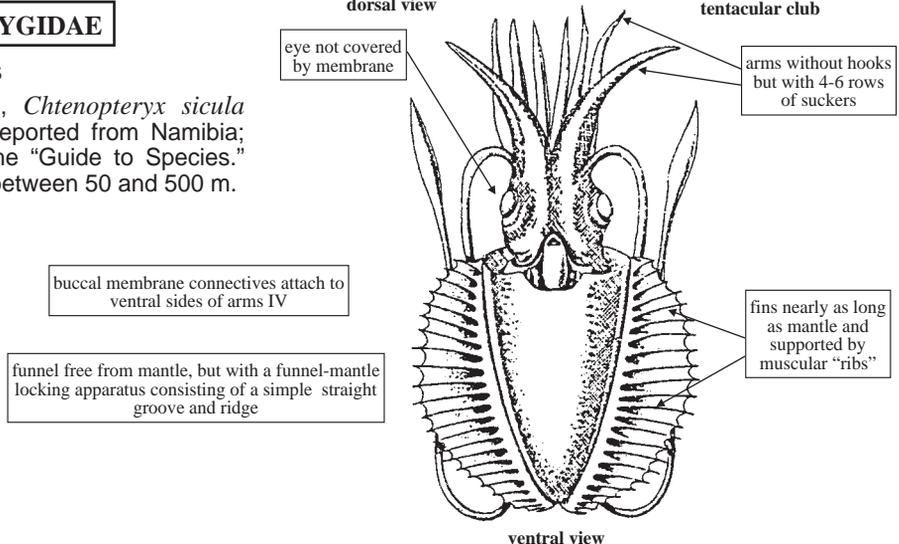
A single species, *Bathyteuthis abyssicola* Hoyle, 1885 thus far reported from Namibia; probably not abundant in sufficient numbers to be of commercial interest and therefore not included in the "Guide to Species." Oceanic, normally found between depths of 700 and 2000 m.



CHTENOPTERYGIDAE

Combfin squids

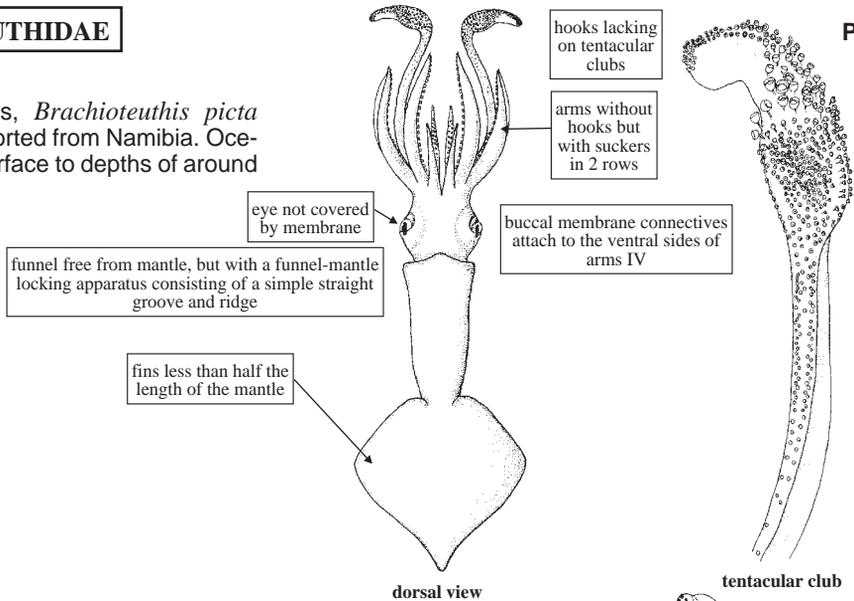
A single species, *Chtenopteryx sicula* (Vérany, 1851), reported from Namibia; not included in the "Guide to Species." Found at depths between 50 and 500 m.



BRACHIOTEUTHIDAE

Arms squids

A single species, *Brachiooteuthis picta* Chun, 1910, reported from Namibia. Oceanic, from the surface to depths of around 750 m.

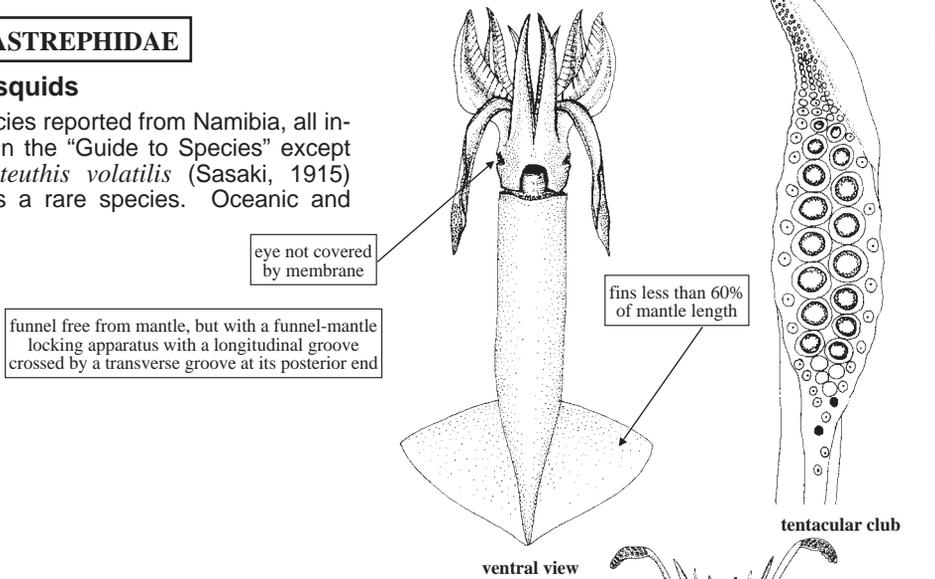


Page 64

OMMASTREPHIDAE

Flying squids

Six species reported from Namibia, all included in the "Guide to Species" except *Ornithoteuthis volatilis* (Sasaki, 1915) which is a rare species. Oceanic and neritic.



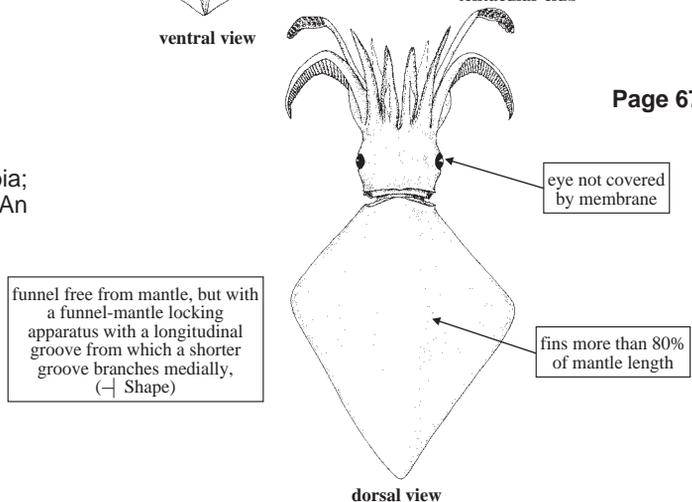
Page 64



THYSANOTEUTHIDAE

Rhomboid squids

A single species reported from Namibia; included in the "Guide to Species." An oceanic, epipelagic species.

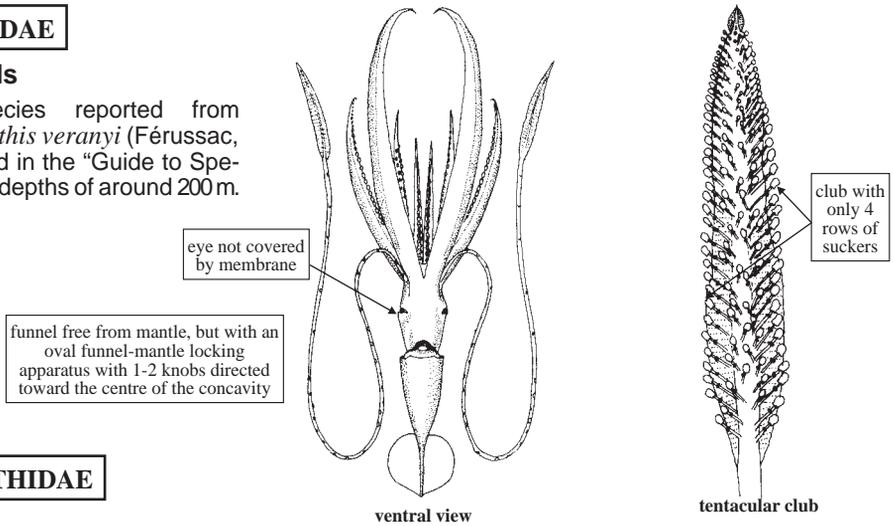


Page 67

CHIROTEUTHIDAE

Longhand squids

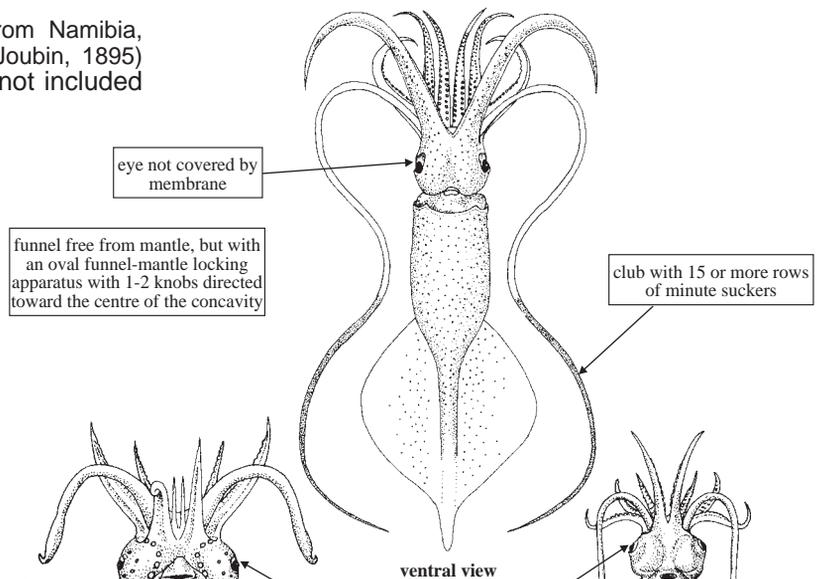
The single species reported from Namibia, *Chiroteuthis veranyi* (Férussac, 1835), not included in the "Guide to Species." Reported at depths of around 200 m.



MASTIGOTEUTHIDAE

Whip squids

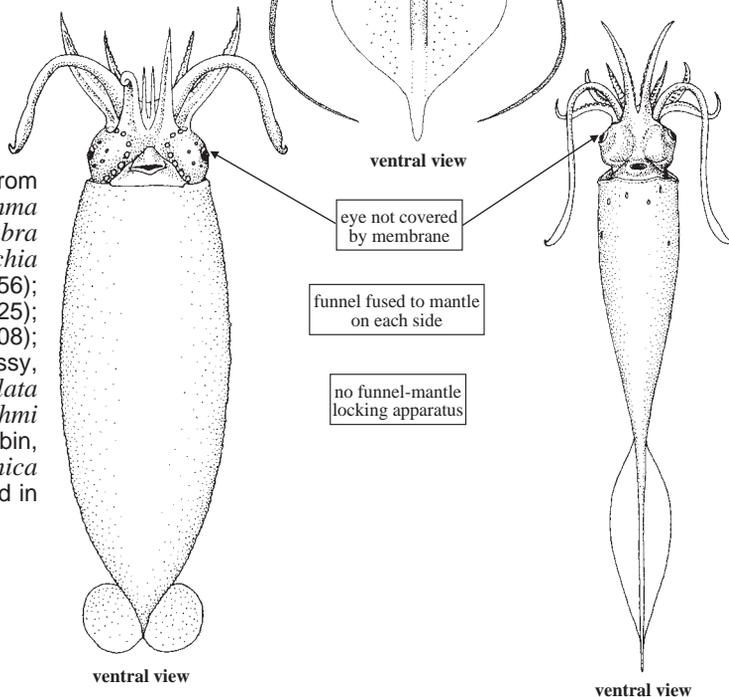
The 2 species reported from Namibia, *Mastigoteuthis grimaldii* (Joubin, 1895) and *Echinoteuthis* sp. are not included in the "Guide to Species."



CRANCHIIDAE

Cranch squids

Ten species reported from Namibia: *Bathothauma lyromma* Chun, 1906; *Cranchia scabra* Leach, 1817; *Liocranchia reinhadi* (Steenstrup, 1856); *Leachia atlantica* (Degner, 1825); *L. pacifica* (Issel, 1908); *Helicocranchia pfefferi* Massy, 1907; *Teuthowenia maculata* (Leach, 1817); *Galiteuthis suhmi* Hoyle, 1885; *G. armata* Joubin, 1898; *Megalocranchia oceanica* (G. Voss, 1960); none included in the "Guide to Species."



Order **VAMPYROMORPHA - Black Octopus**
 Appendages around mouth consisting of 8 arms; suckers stalked; light organs present; colour black. Monotypic, not included in the "Guide to Species."

VAMPYROTEUTHIDAE

Black octopus

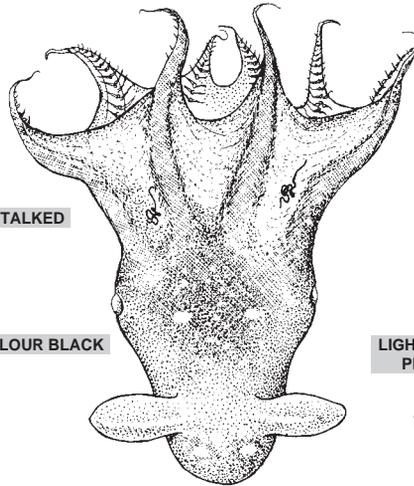
The species *Vampyroteuthis infernalis* Chun, 1903, reported from Namibia; not included in the "Guide to Species."

SUCKERS STALKED

COLOUR BLACK

LIGHT ORGANS PRESENT

APPENDAGES AROUND MOUTH CONSISTING OF 8 ARMS



Vampyroteuthis infernalis

Order **OCTOPODA - Octopuses**
 Appendages around mouth consisting of 8 arms; suckers not stalked; light organs absent; colour never black. Ten species in 6 families reported from Namibia.

OPISTHOTEUTHIDAE

Hairy octopus

The species *Opisthoteuthis agassizi* Verrill, 1883 and *O. rossi* Sanchez and Guerra, 1989, reported from Namibia; not included in the "Guide to Species." Often caught in the deep-water fisheries and referred to as "umbrella squid."

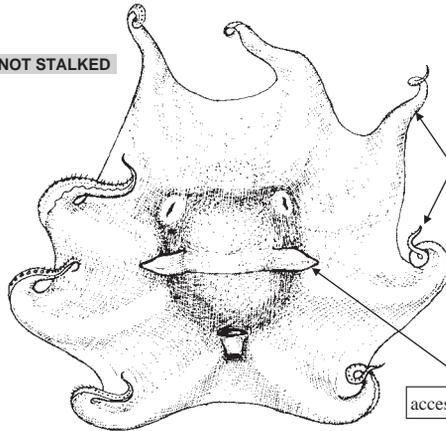
SUCKERS NOT STALKED

COLOUR NEVER BLACK

LIGHT ORGANS ABSENT

APPENDAGES AROUND MOUTH CONSISTING OF 8 ARMS

accessory fins on head



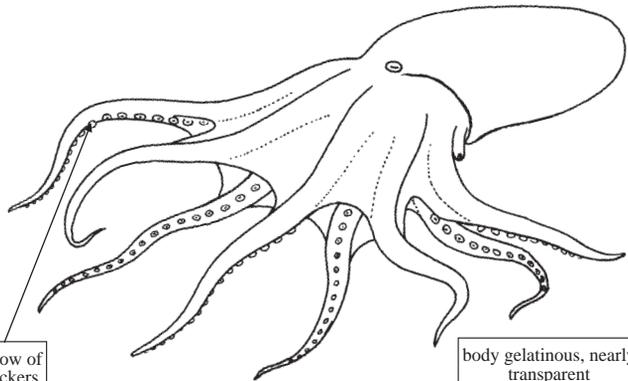
VITRELEDONELLIDAE

Transparent octopus

The species *Vitreledonella richardi* Joubin, 1918, reported from Namibia; not included in the "Guide to Species." Deep sea, pelagic.

1 row of suckers

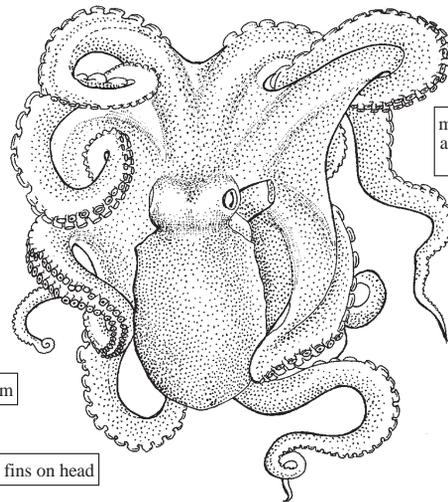
body gelatinous, nearly transparent



OCTOPODIDAE

Octopuses

Of the 7 species reported from Namibia, only *Octopus magnificus* Villanueva, Sanchez, and Roeleveld, 1991 and *Octopus vulgaris* Cuvier, 1797 are included in the "Guide to Species"; not included are: *Aphrodoctopus schultzei* (Hoyle, 1910); *Bathypolypus valdiviae* (Chun and Thiele, 1915); *Benthooctopus* sp.; *Eledone thysanophora* Voss, 1962; and *Graneledone* sp.



male's hectocotyized arm not coiled in sac; shell never present

water pores absent

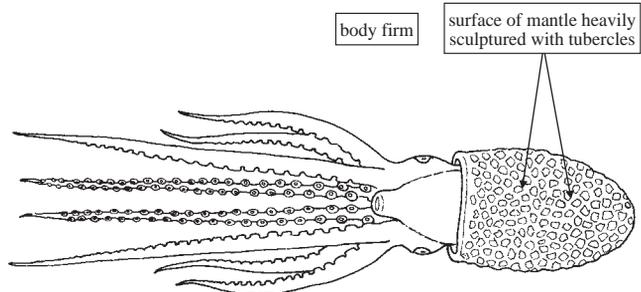
body firm

no accessory fins on head

OCYTHOIDAE

Ocythoids

The species *Ocythoe tuberculata* Rafinesque, 1814, reported from Namibia but very rare; not included in the "Guide to Species."



body firm

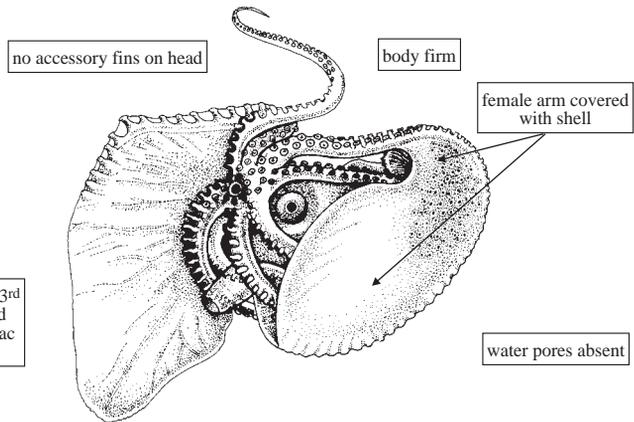
surface of mantle heavily sculptured with tubercles

water pores present ventrally

ARGONAUTIDAE

Argonauts

The species *Argonauta* sp., and *A. nodosa* Solander, 1786, reported from Namibia; neither included in the "Guide to Species."



no accessory fins on head

body firm

female arm covered with shell

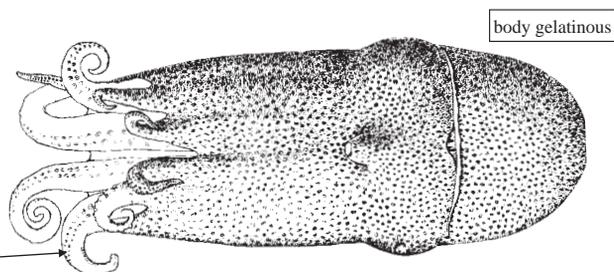
males with left 3rd hectocotyized arm coiled in sac below eye

water pores absent

ALLOPOSIDAE

Alloposid squids

The species *Haliphron atlanticus* Steenstrup, 1861 reported from Namibia; not included in the "Guide to Species."



body gelatinous

2 rows of suckers

Sepia australis Quoy and Gaimard, 1832

(plate IX, 67)

SEPIIDAE

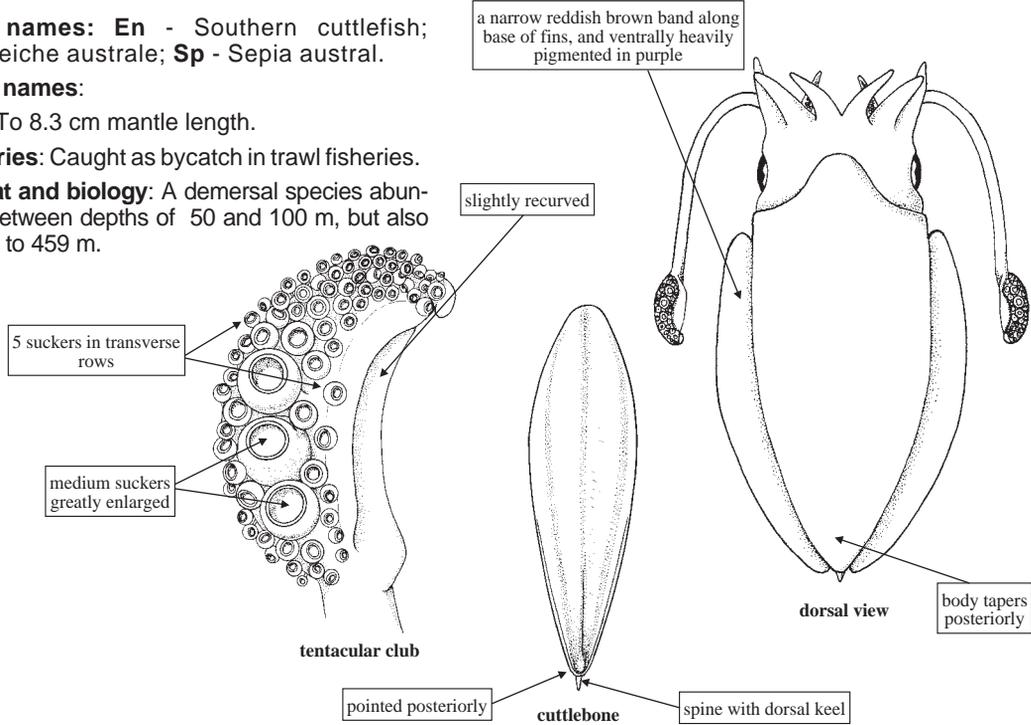
FAO names: En - Southern cuttlefish;
Fr - Seiche australe; Sp - Sepia austral.

Local names:

Size: To 8.3 cm mantle length.

Fisheries: Caught as bycatch in trawl fisheries.

Habitat and biology: A demersal species abundant between depths of 50 and 100 m, but also from 3 to 459 m.



Sepia elegans Blainville, 1827

SEPIIDAE

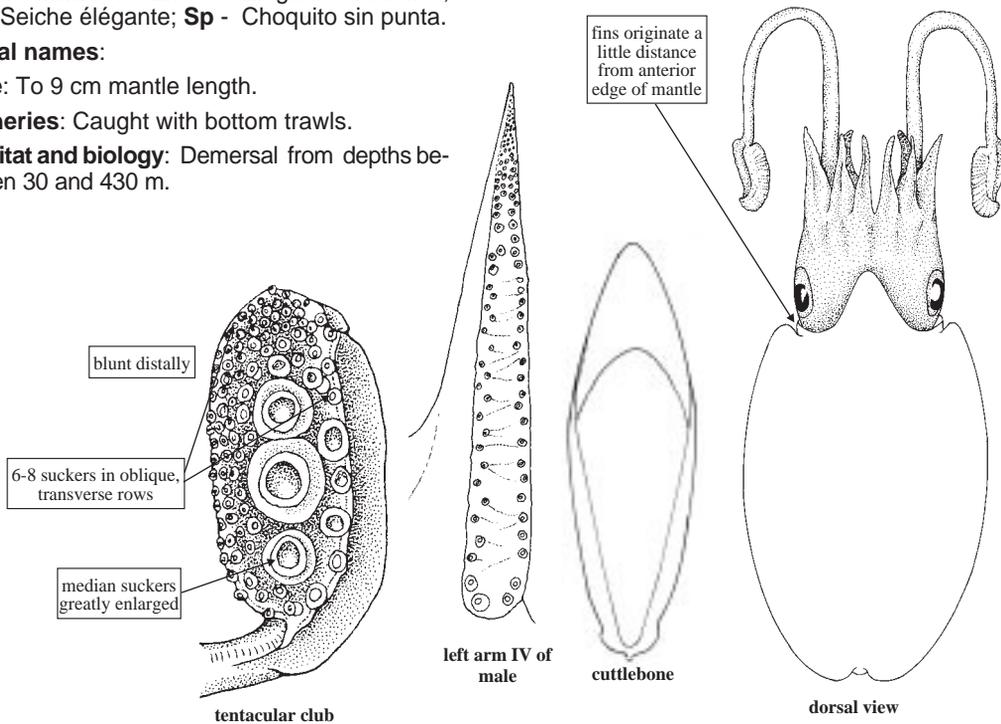
FAO names: En - Elegant cuttlefish;
Fr - Seiche élégante; Sp - Choquito sin punta.

Local names:

Size: To 9 cm mantle length.

Fisheries: Caught with bottom trawls.

Habitat and biology: Demersal from depths between 30 and 430 m.



Sepia hieronis (Robson, 1924)

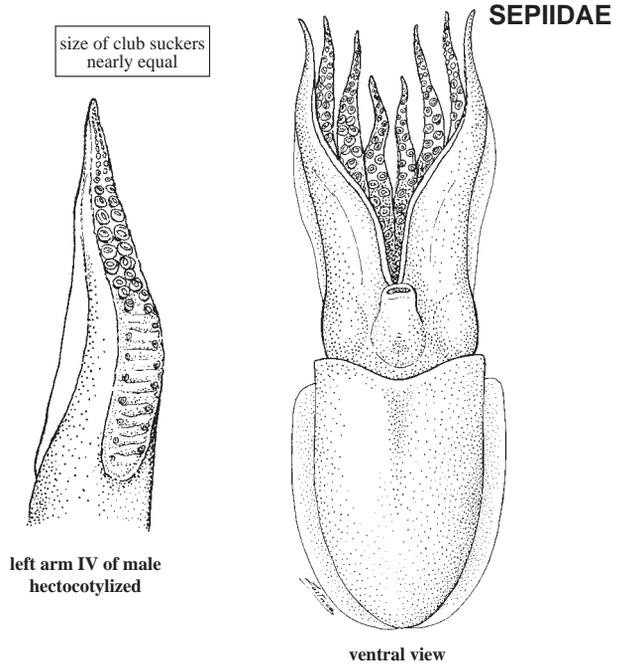
FAO names: En - Bullet cuttlefish; Fr - Seiche balle; Sp - Jibia bala.

Local names:

Size: To 70 cm mantle length.

Fisheries: Taken incidentally in trawls.

Habitat and biology: Demersal in outer shelf and upper slope from depths between 43 and 459 m.

***Sepia vermiculata*** Quoy and Gaimard, 1832

FAO names: En - Common vermiculate cuttlefish.

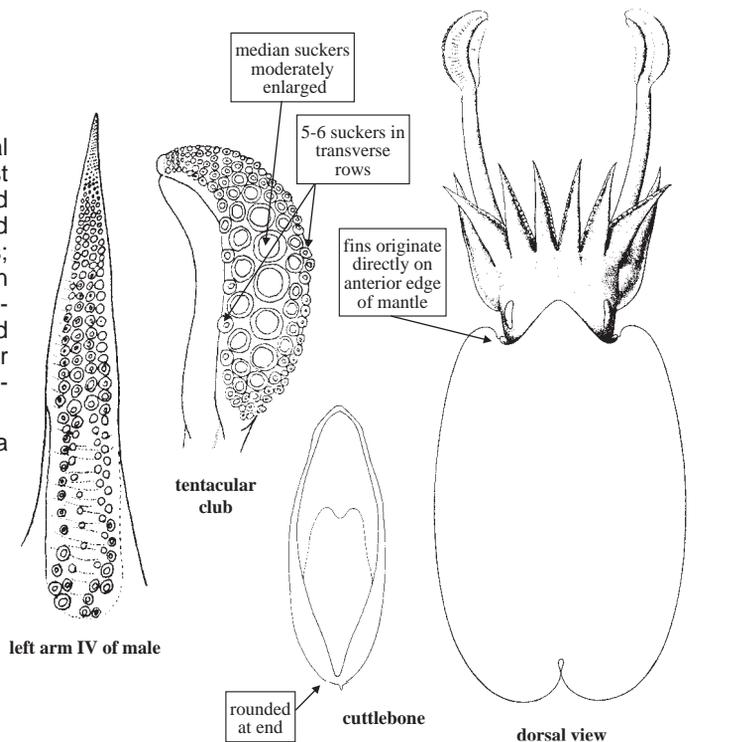
Local names:

Size: To 28.7 cm mantle length.

Fisheries: Caught with bottom trawls.

Habitat and biology: A demersal species of the continental shelf, most abundant at depths between 30 and 100 m, but also found between 0 and 100 m; on sandy to muddy bottoms; spawns in shallow waters. Feeds on molluscs, crabs, shrimps, other cuttlefishes, and juvenile fishes; preyed upon by sharks, sparids, and other demersal fishes; cannibalism is common. Life span is about 2 years.

Remarks: Previously considered a subspecies of *S. officinalis*.



***Sepia papillata* Quoy and Gaimard, 1832**

SEPIIDAE

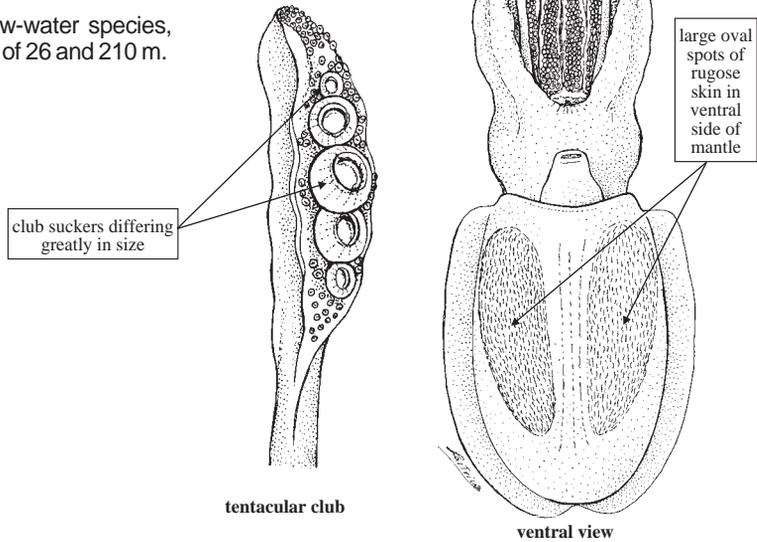
FAO names: **En** - Wrinkled cuttlefish; **Fr** - Seiche ridée; **Sp** - Jibia arrogada.

Local names:

Size: To 13.5 cm mantle length.

Fisheries: None at present.

Habitat and biology: A shallow-water species, over inner shelf between depths of 26 and 210 m.



***Loligo vulgaris reynaudi* Orbigny, 1834-1841**

(plate IX, 68)

LOLIGINIDAE

Synonyms: *Loligo vulgaris* Lamarck, 1798.

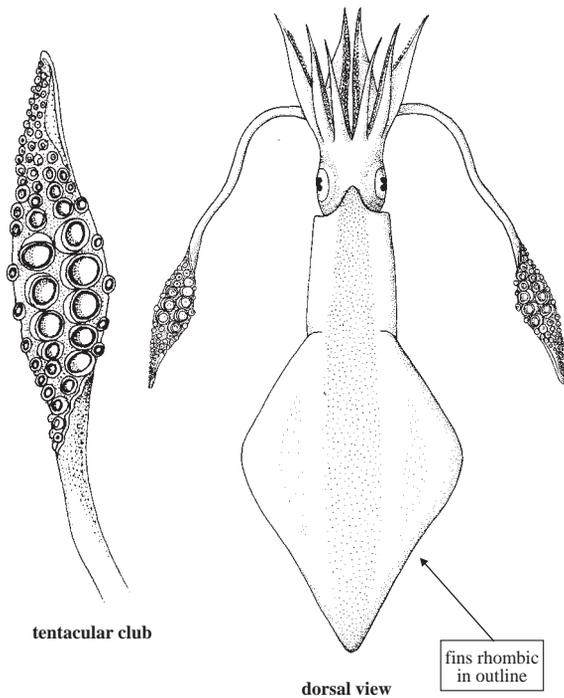
FAO names: **En** - Cape Hope squid; **Fr** - Calmar du Cap; **Sp** - Calamar del Cabo.

Local names:

Size: To 40 cm mantle length.

Fisheries: Caught with bottom and pelagic trawls.

Habitat and biology: Semipelagic, occurs over the continental shelf, to depths of 300 m.



***Lolliguncula mercatoris* Adam, 1941**

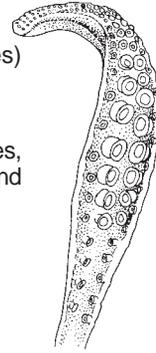
FAO names: **En** - Guinean thumbstall squid;
Fr - Calmar doigtier de Guinée; **Sp** - Calamar dedal de Guinea.

Local names:

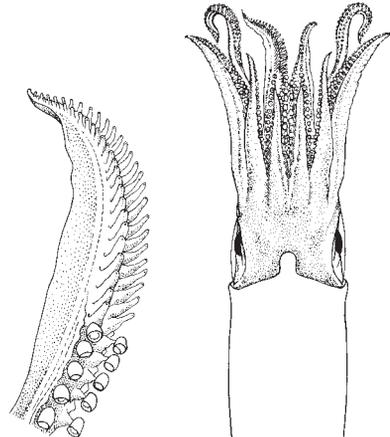
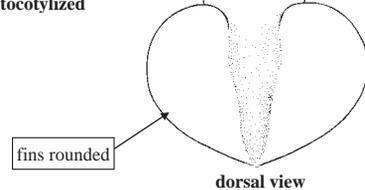
Size: To 5 cm (females) and 3.5 cm (males) mantle length.

Fisheries: Taken incidentally in trawls.

Habitat and biology: A shallow-water species, taken at depths of less than 50 m on mud and sandy mud bottoms, but found down to 100 m.



tentacular club

left arm IV of male
hectocotyized

fins rounded

dorsal view

LOLIGINIDAE***Moroteuthis robsoni* Adam, 1962**

FAO names: **En** - Rugose hooked squid;
Fr - Cornet rugueux; **Sp** - Lurión rugoso.

Local names:

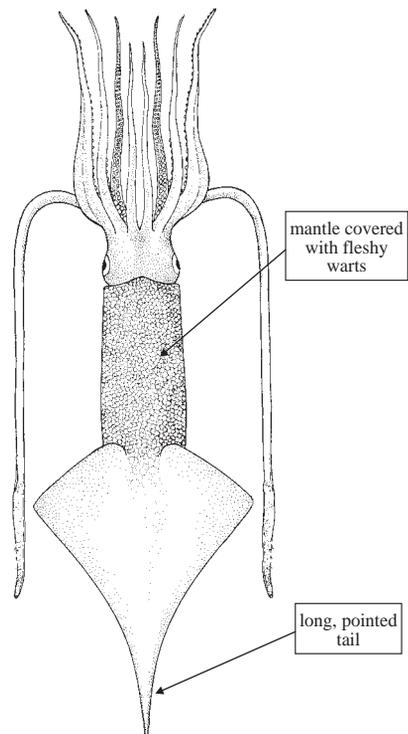
Size: To 75 cm mantle length.

Fisheries: Taken incidentally in trawls. Caught often as bycatch in orange roughy fishery.

Habitat and biology: Oceanic, so far recorded at depths between 200 and 750 m.



tentacular club

mantle covered
with fleshy
wartslong, pointed
tail

dorsal view

ONYCHOTEUTHIDAE

***Onychoteuthis banksii* (Leach, 1817)**

FAO names: **En** - Common clubhook squid; **Fr** - Cornet crochu; **Sp** - Luria ganchuda.

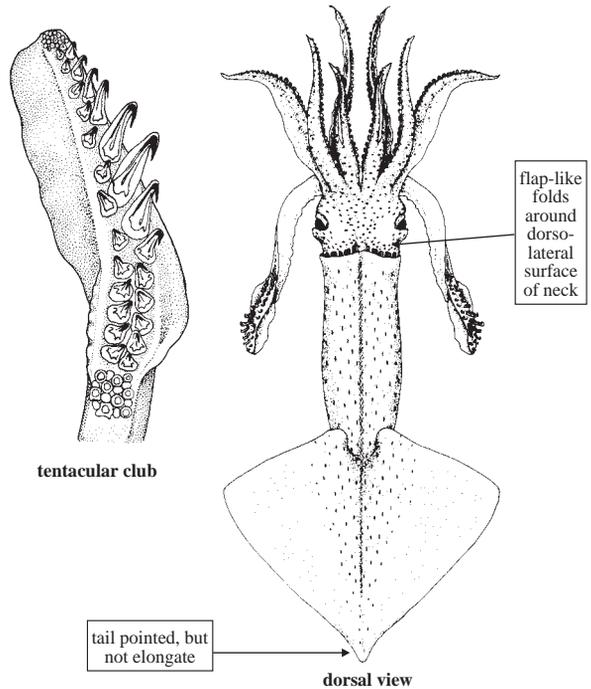
Local names:

Size: To 30 cm mantle length.

Fisheries: None at present.

Habitat and biology: An oceanic species found from the surface to a depth of 150 m. The biology of this species is unknown. A species complex that requires taxonomic resolution.

ONYCHOTEUTHIDAE



***Histioteuthis reversa* (Verrill, 1880)**

FAO names: **En** - Reverse jewel squid; **Fr** - Loutène retournée; **Sp** - Joye luria invertida.

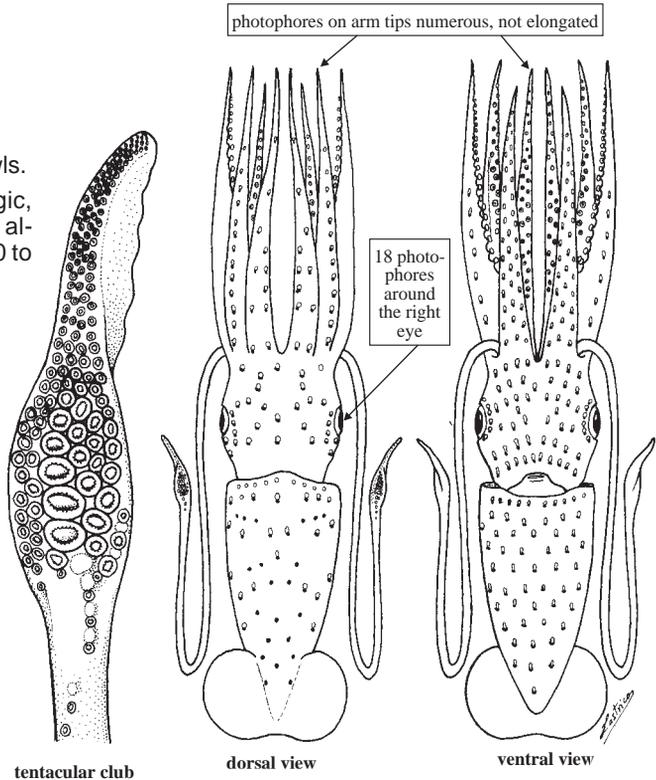
Local names:

Size: To 19 cm mantle length.

Fisheries: Caught incidentally in bottom trawls.

Habitat and biology: Epipelagic, mesopelagic, and at very deep depths, although usually caught at depths around 250 to 350 m.

HISTIOTEUTHIDAE



***Brachiooteuthis picta* Chun, 1910**

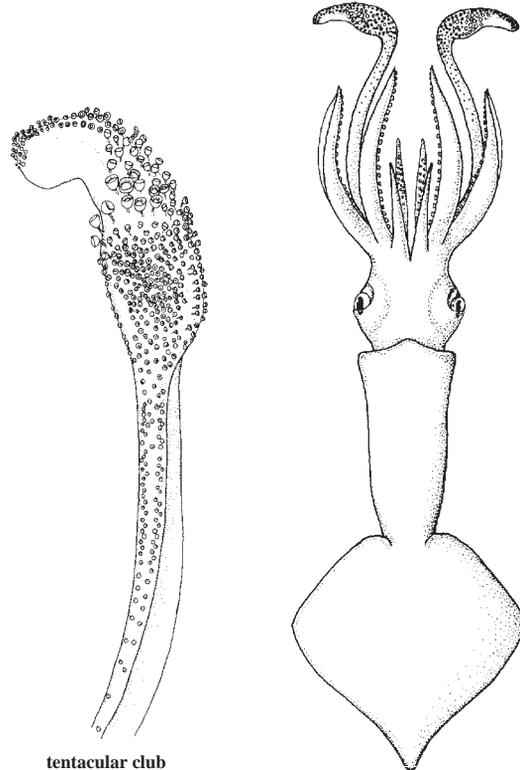
FAO names: **En** - Ornate arm squid;
Fr - Encornet bras courts orné; **Sp** - Braquiluria moteada.

Local names:

Size: To 9 cm mantle length.

Fisheries: Fisheries potential unknown.

Habitat and biology: Oceanic, usually occurring in depths shallower than 500 m but may occur deeper.



tentacular club

dorsal view

BRACHIOTEUTHIDAE***Illex coindetii* (Verany, 1837)**

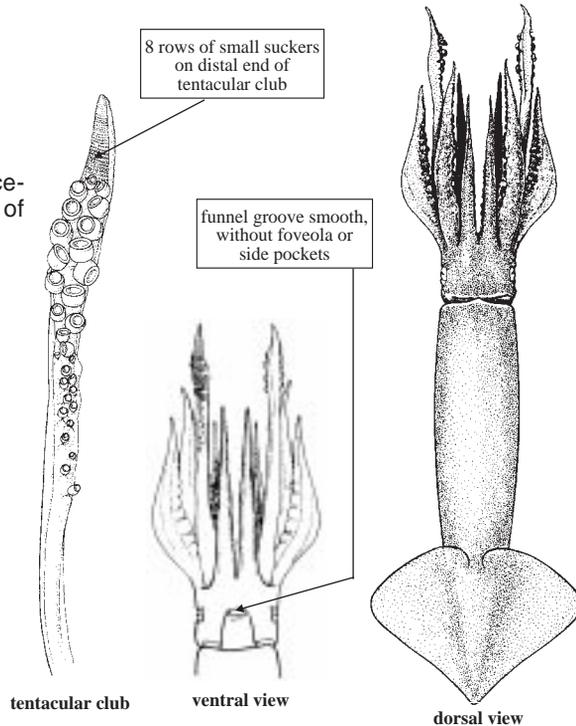
FAO names: **En** - Broadtail shortfin squid;
Fr - Encornet rouge; **Sp** - Pota voladora.

Local names:

Size: To 37 cm mantle length.

Fisheries: Caught with bottom trawls.

Habitat and biology: Semi-demersal, oceanic, and neritic, from the surface to depths of about 1 000 m.



tentacular club

ventral view

dorsal view

OMMASTREPHIDAE

Ommastrephes bartramii (LeSueur, 1821)

OMMASTREPHIDAE

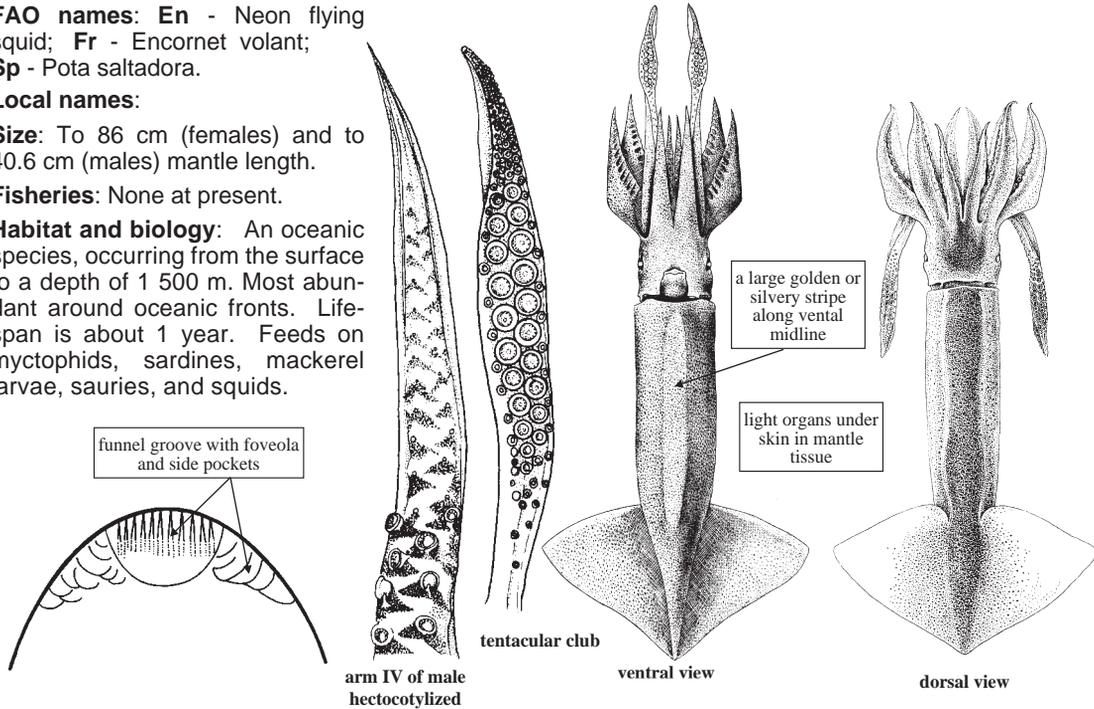
FAO names: **En** - Neon flying squid; **Fr** - Encornet volant; **Sp** - Pota saltadora.

Local names:

Size: To 86 cm (females) and to 40.6 cm (males) mantle length.

Fisheries: None at present.

Habitat and biology: An oceanic species, occurring from the surface to a depth of 1 500 m. Most abundant around oceanic fronts. Life-span is about 1 year. Feeds on myctophids, sardines, mackerel larvae, sauries, and squids.



Stenoteuthis pteropus (Steenstrup, 1855)

OMMASTREPHIDAE

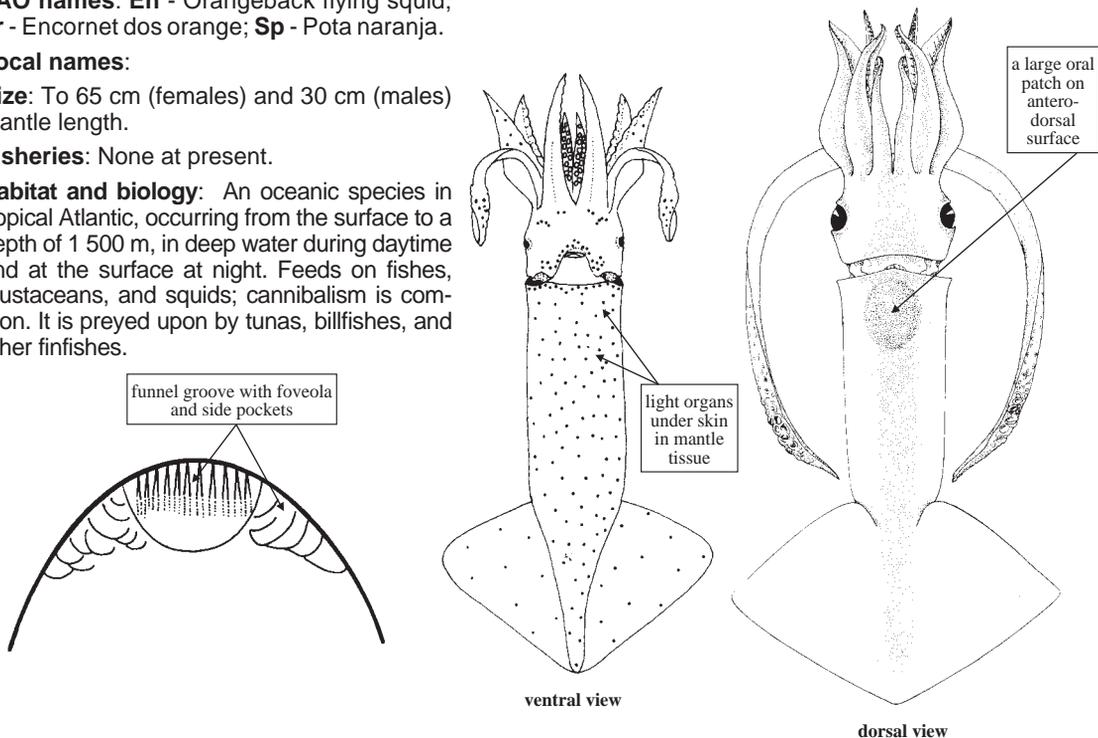
FAO names: **En** - Orangeback flying squid; **Fr** - Encornet dos orange; **Sp** - Pota naranja.

Local names:

Size: To 65 cm (females) and 30 cm (males) mantle length.

Fisheries: None at present.

Habitat and biology: An oceanic species in tropical Atlantic, occurring from the surface to a depth of 1 500 m, in deep water during daytime and at the surface at night. Feeds on fishes, crustaceans, and squids; cannibalism is common. It is preyed upon by tunas, billfishes, and other finfishes.



***Todarodes angolensis* Adam, 1962**

FAO names: **En** - Angola flying squid; **Fr** - Toutenon angolais; **Sp** - Pota angolense.

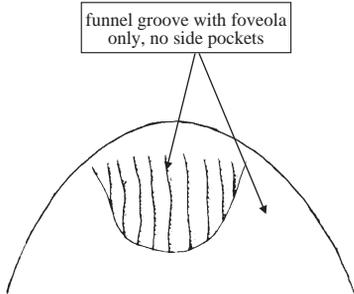
Local names:

Size: To 41 cm mantle length.

Fisheries: Caught as bycatch in trawl and midwater fisheries.

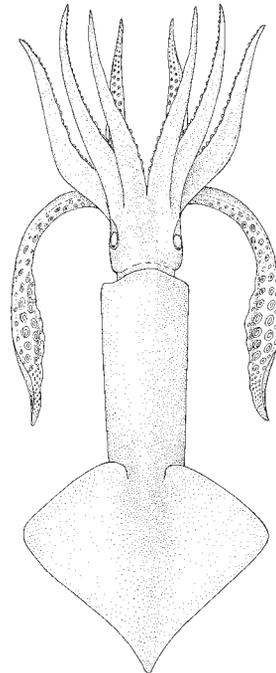
Habitat and biology: Demersal, in depths of 200 to 1 000 m, migrating to surface at night.

OMMASTREPHIDAE



tentacular club

dark red in colour



dorsal view

***Todaropsis eblanae* (Ball, 1841)**

FAO names: **En** - Lesser flying squid; **Fr** - Toutenon souffleur; **Sp** - Pota costera.

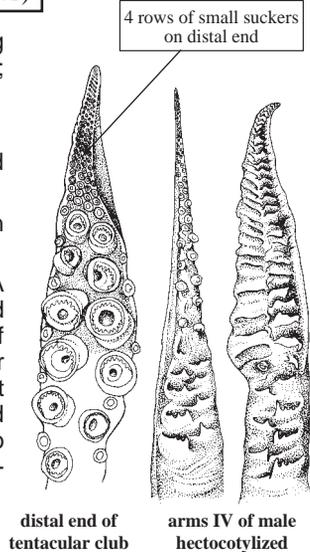
Local names:

Size: To 28 cm (females) and 16 cm (males) mantle length.

Fisheries: Taken as bycatch in trawl fisheries.

Habitat and biology: A demersal species, associated with sandy to muddy bottoms of the continental shelf and upper slope; from 20 to 700 m, most common between 100 and 400 m; temperatures of 9° to 18°C. Is preyed upon by albacore and sevengill sharks.

OMMASTREPHIDAE

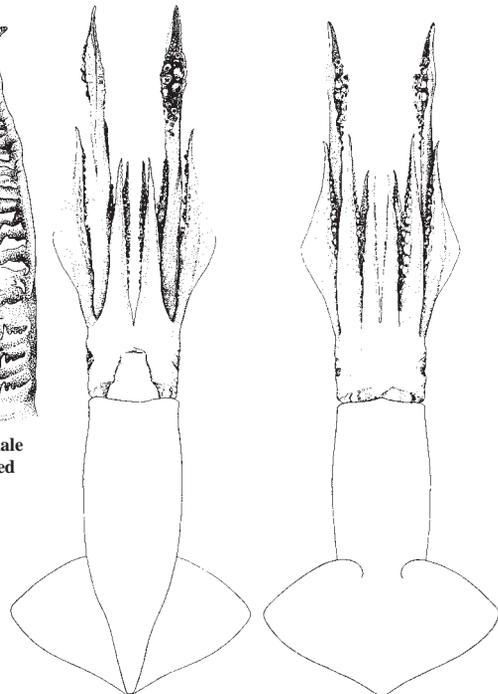


distal end of tentacular club

arms IV of male hectocotylized

funnel groove smooth, without foveola or side pockets

golden or light brown in colour



ventral view

dorsal view

Thysanoteuthis rhombus Troschel, 1857

THYSANOTEUTHIDAE

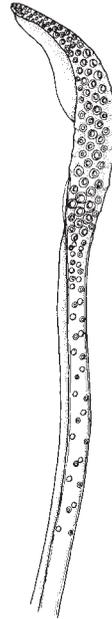
FAO names: **En** - Diamondback squid;
Fr - Chipiloua commun; **Sp** - Chipirón volanfín.

Local names:

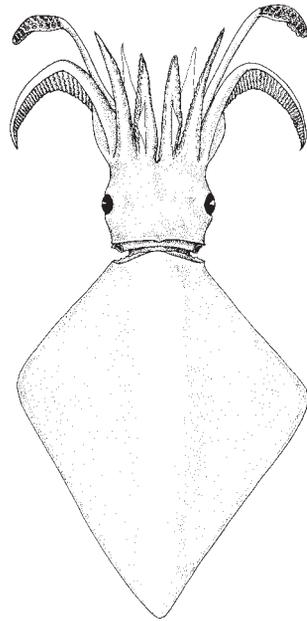
Size: To 100 cm mantle length; weight to 20 kg.

Fisheries: None at present.

Habitat and biology: Epipelagic and oceanic, usually found in surface waters. Preyed upon by sperm whales and blue marlins.



tentacular club



dorsal view



Octopus magnificus Villanueva, Sánchez, and Compagno Roeleveld, 1991

OCTOPODIDAE

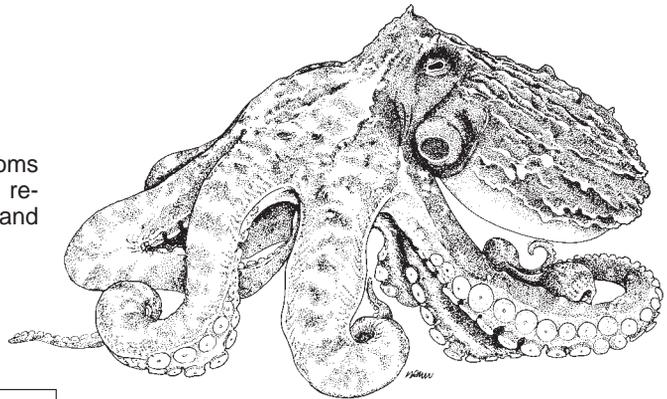
FAO names: **En** - Magnificent octopus.

Local names:

Size: To 36 cm mantle length.

Fisheries: Caught incidentally in trawls.

Habitat and biology: Mostly on sandy bottoms at depths between 2 and 560 m. So far, reported only from offshore around Lüderitz and south of Lüderitz.



ligula long, 14-22.2% length of hectocotylized arm

Octopus "vulgaris"* Cuvier, 1797*OCTOPODIDAE**

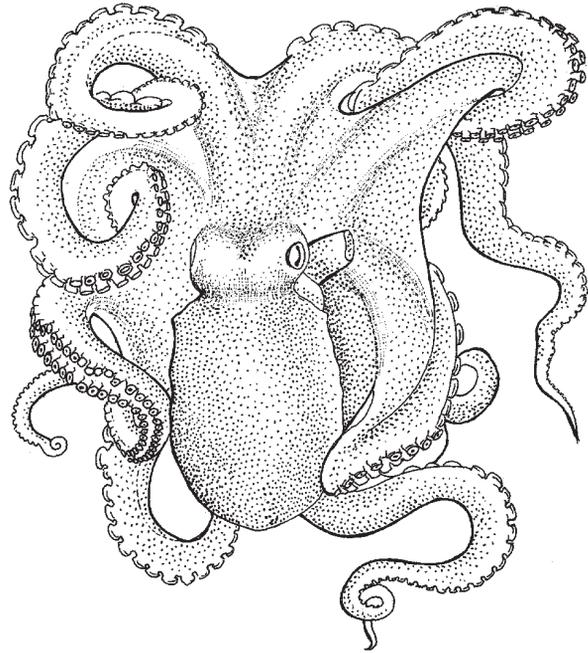
FAO names: **En** - Common octopus;
Fr - Pieuvre; **Sp** - Pulpo común.

Local names:

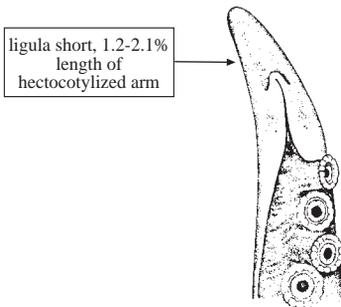
Size: To 120 cm (females) and 130 cm (males) total length.

Fisheries: Caught on hook-and-line, with pots, spears, and otter trawls.

Habitat and biology: A benthic species found on various habitats from depths of 0 to 200 m, usually in shallower waters in the summer. Feeds on bivalves, lobsters, and other crustaceans. Preyed upon by albacore (juveniles) and by benthic fishes.



dorsal view



ligula short, 1.2-2.1%
length of
hectocotylized arm

tip of hectocotylized
right arm III of male