

**2.15 Family JOUBINITEUTHIDAE Naef, 1922**

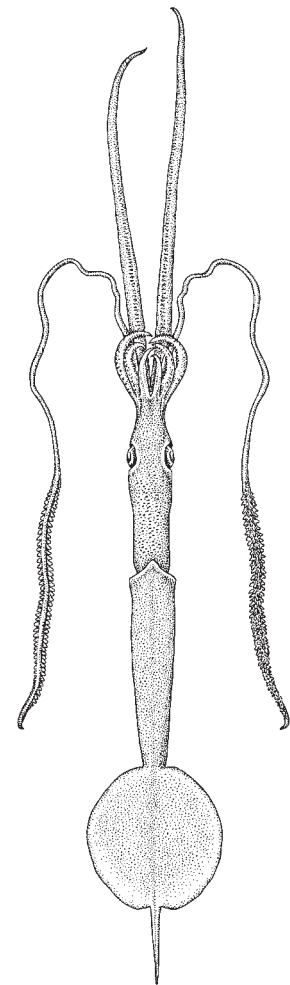
by Clyde F.E. Roper and Patrizia Jereb

Joubiniteuthidae Naef, 1922, *Die Fossilen Tintenfische*, 322 pp. [299].**Type Genus:** *Joubiniteuthis* Berry, 1920.**FAO Names:** **En** – Joubin's squids; **Fr** – Loutènes de Joubin; **Sp** – Lurias de Joubin.

**Diagnostic Features:** Arm pairs I to III extremely long, thin, greater than 2 times the mantle length, very small suckers in 6 transverse series; arms I to III joined by a low web. Ventral arms (IV) short (length one-third of, or less, than length of arms I to III) with suckers in 4 transverse series. Tentacles in juveniles shorter and much thinner than arms I to III, thread-like; tentacular clubs laterally compressed; bear minute suckers in 5 to 12 transverse series; protective membranes present only in distal half of club; no fixing apparatus (carpus); adult tentacles fully reduced. Buccal membrane with 7 lappets; buccal connectives attach to ventral borders of arms IV. Head narrow, eyes small, neck long. Mantle long, narrow, posterior conical; semigelatinous. Tail long (longer than the mantle) and very slender, needle-like; it is comprised of the conus which is elongate with ventral fusion, covered only by soft, thickened integument. Fins relatively very small, ovoid, width nearly equal to length. Funnel-locking apparatus with oval depression, without tragus or antitragus. Buccal connectives attached to ventral borders of arms IV. Hectocotylus absent. Photophores absent.

**Size:** Small-sized squid; maximum mantle length to 105 mm.**Geographical Distribution:** Circumglobal, in tropical and subtropical waters.**Habitat and Biology:** A mesopelagic to bathypelagic, rarely encountered, squid. Little is known about the biology of this squid.**Remarks:** This monotypic family contains a single species.**Literature:** Young and Roper (1969b), Nesis (1982, 1987), Sweeney and Young (2003m), Young (2008a).***Joubiniteuthis* Berry, 1920***Joubiniteuthis* Berry, 1920b, *Biological Bulletin*, 38(3): 141–169 [152].**Type Species:** *Joubiniteuthis portieri* (Joubin, 1916).**Frequent Synonyms:** *Valdemaria* Joubin, 1931.**Diagnostic Features:** The same as given for the family.***Joubiniteuthis portieri* (Joubin, 1916)****Fig. 253; Plate VII, 42***Chiroteuthis portieri* Joubin, 1916, *Bulletin de l'Institut Océanographique, Monaco*, 317: 1–10. [1]. [Type locality: 29°03'N, 16°08'30"W, eastern Central Atlantic Ocean].**Frequent Synonyms:** *Valdemaria danae* Joubin, 1931.**FAO Names:** **En** – Joubin's squid; **Fr** – Loutène de Joubin; **Sp** – Luria de Joubin.

**Diagnostic Features:** The features are the same as those given for the family. Paralarvae with semi-transparent, spindle-shaped mantle, very small leaf-like fins, needle-like tail longer than mantle, possibly a small secondary fin at posterior one-third point of needle-like tail. Neck short without septa. Arm-crown pillar absent. Arms and tentacles proportionally very short at mantle length less than 10 mm; tentacles short and thick, club very short, 4 transverse series of suckers at 6 to 9 mm mantle length, 8 series at 18 mm mantle length. The thick tentacles, long arms and very long tail are characteristic in adults.

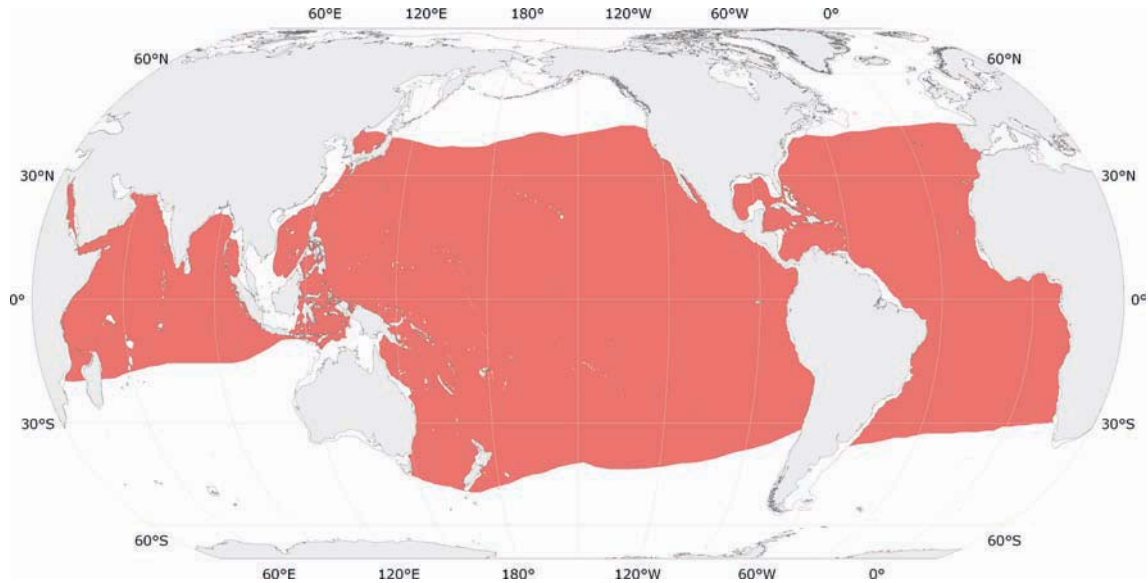


dorsal view

**Fig. 253** *Joubiniteuthis portieri*

**Size:** Mantle length of mature male 105 mm; tail length an additional 155 mm.

**Geographical Distribution:** Cosmopolitan in tropical and subtropical, even temperate waters; Atlantic Ocean, 40°N to 30°S, including Caribbean Sea; Pacific Ocean, Hawaii, Japan, eastern Australia, Tasman Sea, New Zealand (Fig. 254).



**Fig. 254** *Joubiniteuthis portieri*

■ Known distribution

**Habitat and Biology:** Males are fully mature at 105 mm mantle length; females clearly developing but immature at 85 mm mantle length, with paired nidamental glands. Depths of capture in open nets range from 300 to 500 m at night (1 at 3 500 m) and 800 to 2 500 m during daytime: this clearly is a meso- to bathypelagic species. Specimens are reported as prey of lancetfish, blue shark and sperm whale.

**Interest to Fisheries:** None.

**Remarks:** This is a very rare species with only a few dozen specimens known.

**Literature:** Young and Roper (1969b), Nesis (1999b), Seibel *et al.* (2000b), Vecchione (2002), Vecchione *et al.* (2002).

**2.16. Family LEPIDOTEUTHIDAE Pfeffer, 1912**

by Clyde F.E. Roper and Patrizia Jereb

Lepidoteuthidae Pfeffer, 1912, *Ergebnisse der Plankton-Expedition der Humboldt-Stiftung*, 2: 1–815. [535].**Type Genus:** *Lepidoteuthis* Joubin, 1895:**FAO Names:** **En** – Soft-scaled squids; **Fr** – Loutènes écaille-doux; **Sp** – Lurias escamuda blandas.

**Diagnostic Features:** Distinct dermal cushions (formerly called “scales”) present on the mantle; mantle of paralarvae and juveniles covered with small papillae, the precursors to dermal cushions; **dermal cushions are relatively large, diamond-to hexagonal-shaped structures** that cover the whole circumference of the mantle except on the posteroventral part under the posterior half of the fins; they **resemble scales of some fishes in outline and in overlapping arrangement**, but they lack any form of solid bony structure; the cushions overlap tightly, like roofing tiles, and are at least 10 by 12 mm in dimension in adults; the internal structure is highly vacuolate with loose connective tissue forming the “walls” of the chambers; dermal cushions occur only on the mantle, not on fins, funnel, head nor arms; papillae in juveniles each have 2 to 4 minute “cartilaginous” points or tips. **Buccal connectives attach to the ventral borders of arms IV; funnel- locking cartilage a straight, simple groove, deeper anteriorly.** Suckers biserial on the arms with long, sharply-pointed teeth on distal half of inner ring; a few (6 to 8) suckers occur on the small, slightly expanded tentacular clubs of paralarvae and juveniles; tentacles present but weakly developed in young, absent in subadults and adults (from about 85 mm mantle length). **Fins large, terminal, not lobed or scaled, together are oval shaped** with the long axis longitudinal with the mantle. The posterior end of the mantle bulges slightly. The gladius is very thin, narrow; posteriorly it consists of a dorsal, axial, cartilaginous rod enveloped by a very elongate chitinous conus. Arms on adults thickened, subequal in length. **Photophores absent. Hectocotylus absent.** Males have a pair of very enlarged, saber-like hooks near the base of arms II.

**Size:** Large-sized squid; maximum mantle length to 1 m.

**Remarks:** The family is monotypic, although for a period of time 2 other genera, *Pholidoteuthis* and *Tetronychoteuthis*, were included on the basis of shared, curious dermal cushions, so-called “scales”. Subsequent analyses have proven that these genera are not related at the familial level based on several important non-shared characters (Clarke 1980; Roper and Lu, 1989; Nesis and Nikitina, 1990; O’Shea *et al.* 2007).

**Literature:** Roper and Lu (1989), Nesis and Nikitina (1990), Sweeney and Young (2003n), O’Shea *et al.* 2007, Young and Vecchione (2008c).

***Lepidoteuthis* Joubin, 1895***Lepidoteuthis* Joubin, 1895b, *Compte Rendu des Séances de l’Académie des Sciences*, 121: 1172–1174 [1172].**Type Species:** *Lepidoteuthis grimaldii* Joubin, 1895.**Frequent Synonyms:** *Enoptroteuthis* Berry, 1920.**Diagnostic Features:** The diagnostic features are the same as given in the family.***Lepidoteuthis grimaldii* Joubin, 1895****Fig. 255**

*Lepidoteuthis grimaldii* Joubin, 1895b, *Compte Rendu des Séances de l’Académie des Sciences*, 121: 1172–1174. [1172]. [Type locality: 38°34’;45”N, 29°37’W, near Teceira, Azores Islands, central North Atlantic Ocean (from sperm whale stomach)].

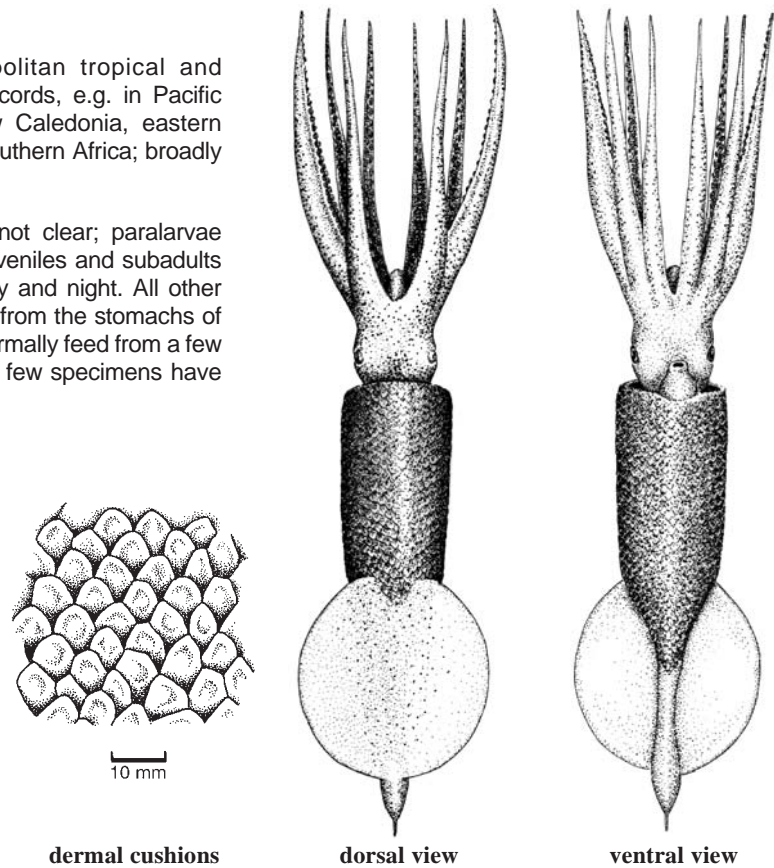
**Frequent Synonyms:** *Enoptroteuthis spinicauda* Berry, 1920a.

**FAO names:** **En** – Grimaldi's soft-scaled squid; **Fr** – Loutène écaille-doux de Grimaldi; **Sp** – Luria escamuda blanda de Grimaldi.

**Size:** Mantle length to 1 m.

**Geographical Distribution:** A cosmopolitan tropical and subtropical species with broadly disjunct records, e.g. in Pacific Ocean from Hawaii, Honshu, Japan, New Caledonia, eastern Australia, Tasman Sea; western Australia, southern Africa; broadly in Atlantic Ocean (Fig. 256).

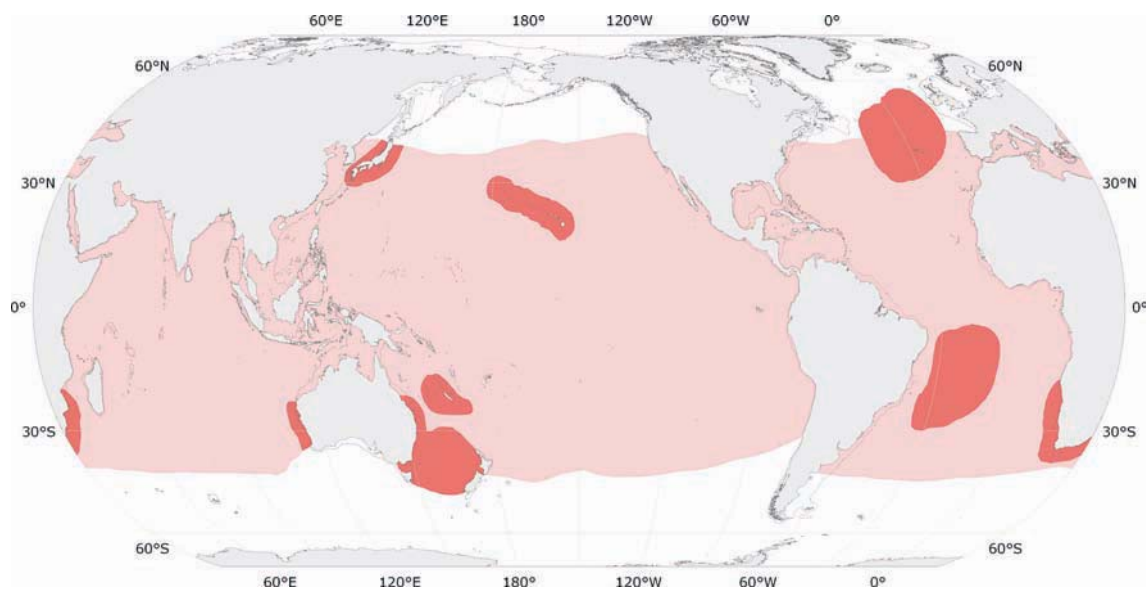
**Habitat and Biology:** Vertical distribution not clear; paralarvae have been taken in upper 100 m at night; juveniles and subadults have been taken in open nets to 700 m day and night. All other records of larger subadults and adults come from the stomachs of predatory deep sea fishes and whales that normally feed from a few hundred metres to 2 000 m. While relatively few specimens have been studied, some information is available on its biology. *Lepidoteuthis grimaldii* is a mesopelagic to bathypelagic, benthic-bathyal species. It is preyed upon by sperm whales, lancetfish (*Alepisauris*), yellowfin tuna, scabbard fish, dolphins, pilot whales, deep-sea sharks. Paralarvae attain the relatively large size of 10 mm mantle length or larger prior to becoming juveniles. The large, thick tentacles of paralarvae have small, compact clubs with 6 to 8 suckers in 2 transverse series, some very small, others very much larger; tentacles are lost by the early subadult stage. The unusual dermal cushions with very numerous internal vacuoles might function as a buoyancy mechanism if the vacuoles contain a lightweight fluid such as ammonium chloride.



**Fig. 255** *Lepidoteuthis grimaldii*

**Interest to Fisheries:** None currently, but it attains a large size (1 m mantle length) and its mantle musculature is relatively firm, not gelatinous. Its deep-sea habitat and apparently low population density would be deterrent factors in developing a fishery.

**Literature:** Clarke and Maul (1962), Roper and Young (1975), Nesis (1982, 1987), Roper and Lu (1990), Nesis and Nikitina (1990), Young (1992 [1991]), Vecchione and Pohle (2002), Okutani (2005), Young and Vecchione (2008c).



**Fig. 256** *Lepidoteuthis grimaldii*

■ Known distribution      ■ Probable presence

**2.17 Family LYCOTEUTHIDAE Pfeffer, 1908**

by Clyde F.E. Roper and Patrizia Jereb

Lycoteuthidae Pfeffer, 1908a, *Mitteilungen aus dem Naturhistorischen Museum Hamburg*, 25: 287–295 [287].**Type Genus:** *Lycoteuthis* Pfeffer, 1900.**FAO Names:** **En** – Firefly squids; **Fr** – Encornets luciole; **Sp** – Luciernalurias.

**Diagnostic Features:** **Suckers only present on arms** (in 2 series) **and clubs** (in 4 transverse series); **hooks absent**. Carpal-locking apparatus with few suckers and knobs, often compact, in circular arrangement. Fins broad, rhomboidal, occasionally posteriorly extended into a tail. **Four or 5 oval photophores** on ventral surface of eyeball. **Visceral photophores: anal, branchial, abdominal and postero-abdominal organs**. Spherical **photophores embedded in tentacular stalks**. Buccal membrane with 8 lappets and supports; connectives to arms IV attach to dorsal margins. Spermatangia attach to modified tissue in nuchal region. Funnel-locking apparatus a straight, simple groove. Gladius with conus and elongate conus field.

**Size:** Mostly small-, rarely medium-sized squids; maximum recorded mantle length 194 mm.**Geographical Distribution:** Circumglobal, mostly in tropical and subtropical waters, but not known from the North Pacific Ocean.**Habitat and Biology:** These muscular squids with conical mantles occupy mesopelagic to bathyal/mesopelagic depths during the day and migrate into near-surface waters at night. They possess a large variety of luminous organs. Strong sexual dimorphism in general morphology occurs in some species.**Interest to Fisheries:** One of the species may be of interest as a commercial fishery.**Remarks:** Two subfamilies are recognized, the Lycoteuthinae and the Lampadioteuthinae. The Lampadioteuthinae is monotypic, and the only genus contains a single species, *Lampadioteuthis megaleia*; the Lycoteuthinae consists of 3 genera; 1 is monotypic (*Selenoteuthis*) while the other 2 contain 2 species each.**Literature:** Voss (1962c), Roper and Young (1975), Vecchione and Young (1999a), Arocha (2003), Sweeney and Young (2003p).**Key to the subfamilies of Lycoteuthidae**

- 1a.** Five photophores on ventral surface of eyeball, all evenly spaced and aligned in a row; 2 photophores on tentacular stalk; abdominal photophores present; hectocotylus absent; paired penes may be present; rostrum on gladius absent . . . . . **Lycoteuthinae**
- 1b.** Four photophores on eyeball arranged in a complex pattern; 4 photophores on tentacular stalk, 1 at base; abdominal photophores absent; hectocotylus present; paired penes absent; rostrum on gladius present . . . . . **Lampadioteuthinae**

**Subfamily LYCOTEUTHINAE Pfeffer, 1908**Lycoteuthinae Pfeffer, 1908a, *Mitteilungen aus dem Naturhistorischen Museum Hamburg*, 25: 287–295 [287].**Type Genus:** *Lycoteuthis* Pfeffer, 1900.**Key to genera of Lycoteuthinae**

- 1a.** Arms III greatly elongate, filiform, much longer than mantle; suckers absent distally . . . . . ***Nematolampas***
- 1b.** Arms III not elongate, not longer than mantle; suckers present distally . . . . . **→ 2**
- 2a.** One large, spherical photophore embedded at posterior tip of mantle in males and females; spherical photophore on tip of arms II and III in males . . . . . ***Selenoteuthis***
- 2b.** No large, spherical photophore at posterior tip of mantle in males and females; spherical photophores absent on tips of arms II and III in males . . . . . ***Lycoteuthis***

**Lycoteuthis** Pfeffer, 1900**Plate VIII, 44**

*Lycoteuthis* Pfeffer, 1900, *Mitteilungen aus dem Naturhistorischen Museum Hamburg*, 17(2): 147–198.

**Type Species:** *Lycoteuthis lorigera* (Steenstrup, 1875).

**Frequent Synonyms:** *Thaumatolampas* Chun, 1903b; *Asthenoteuthion* Pfeffer, 1912; *Leptodontoteuthis* Robson, 1926a; *Oregoniateuthis* Voss, 1956.

**Lycoteuthis lorigera** (Steenstrup, 1875)**Fig. 257**

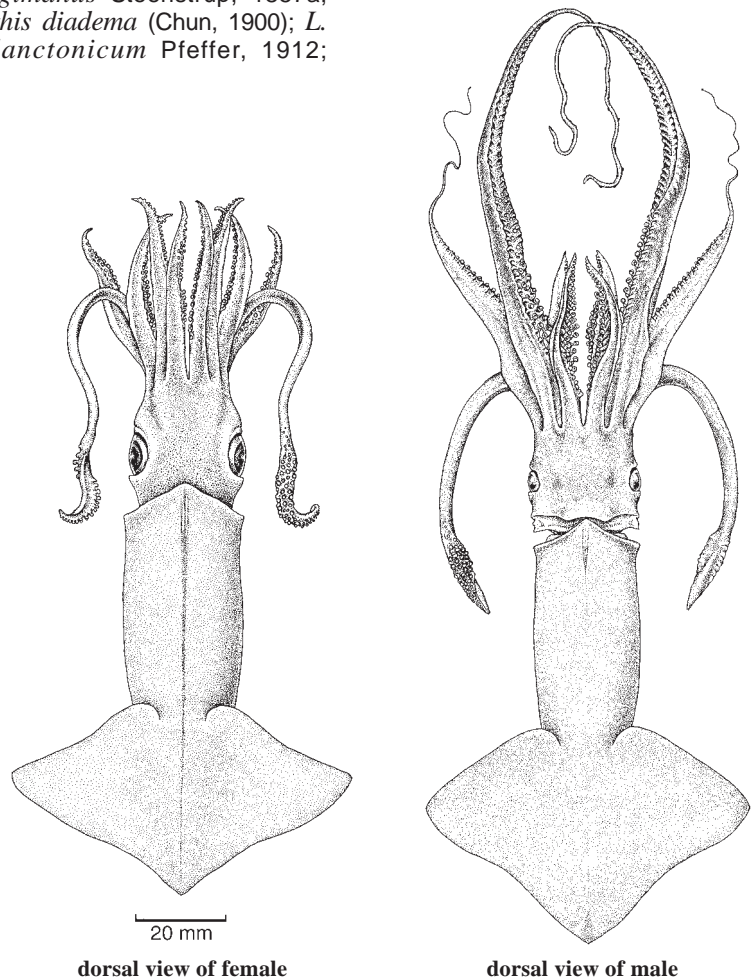
*Onychoteuthis lorigera* Steenstrup, 1875, *Danske Videnskabernes Selskabs Skrifter*, 5 Række, *Naturvidenskabelig og Mathematisk*, 10(7): 465–482. [473], 2 pl. [Type locality: 31°21'S, 15°58'E eastern South Atlantic Ocean].

**Frequent Synonyms:** ?*Onychoteuthis longimanus* Steenstrup, 1857a; *Enoploteuthis diadema* Chun, 1900; *Lycoteuthis diadema* (Chun, 1900); *L. jattai* Pfeffer, 1900; *Asthenoteuthion planctonicum* Pfeffer, 1912; *Leptodontoteuthis inermis* Robson, 1926a.

**FAO Names:** **En** – Crowned firefly squid;  
**Fr** – Encornet luciole couronné;  
**Sp** – Luciernaluria coronada.

**Diagnostic Features:** **Arms II greatly elongated in males**, with a series of regularly spaced photophores on the aboral surface. **Three abdominal photophores present.** Males with additional photophores on arms III, head and mantle. **Male genitalia paired.**

**Size:** Mantle length maximum to about 190 mm in males.



**Fig. 257** *Lycoteuthis lorigera*

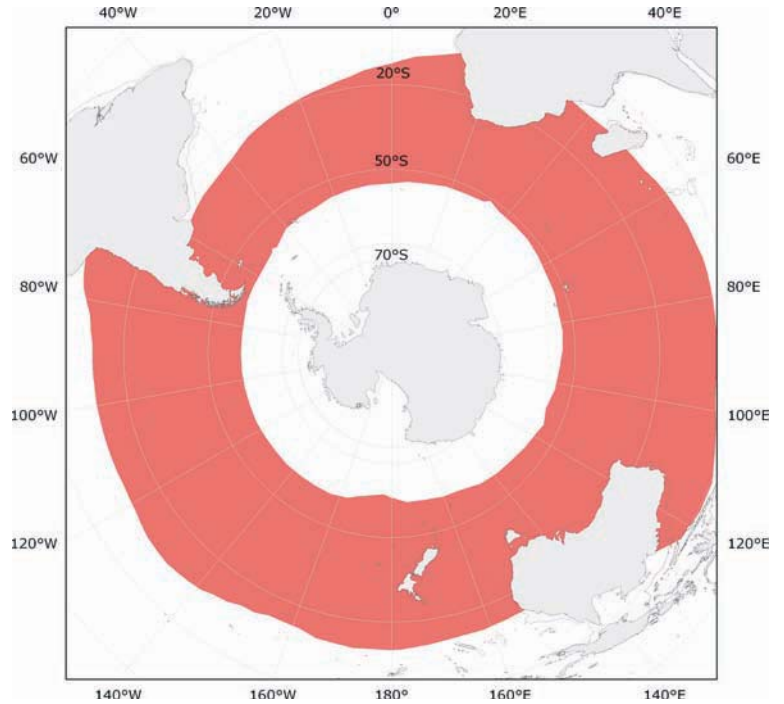
**Geographical Distribution:** Circumglobal in southern, subtropical and notalian zones (Fig. 258).

**Habitat and Biology:** Bathyal- and mesopelagic over slopes and seamounts. Females are smaller than males, around 110 mm mantle length maximum. The only mature male aged was estimated to have 386 growth increments on the statoliths. Paired spermatophoric and terminal organs (penes) in males are both functioning.

**Interest to Fisheries:** While no commercial fishery currently exists, *Lycoteuthis lorigera* (referred to as *L. diadema*), was found to be sufficiently abundant in the Benguela ecosystem to support a fishery.

**Remarks:** The long-used name for this species, familiar to most teuthologists even currently, was *Lycoteuthis diadema* (Chun, 1900). This species was designated a junior synonym to *L. lorigera* (Steenstrup, 1875) by Villanueva and Sanchez (1993: 31). Consequently the combination *L. diadema* can no longer be used. Females of this species are, presently, indistinguishable from those of *L. springeri*. It has been suggested that the very elongated and modified arms II and III in males may play a role in spermatophore transfer during mating (Villanueva and Sanchez, 1993; Hoving *et al.*, 2007).

**Literature:** Voss (1962c), Nesis (1982, 1987), Lipinski (1992), Villanueva and Sanchez (1993), Alekseyev (1994a), Vecchione and Young (1999b), Hoving *et al.* (2007).



**Fig. 258** *Lycoteuthis lorigera*

■ Known distribution

***Lycoteuthis springeri* (Voss, 1956)**

*Oregoniateuthis springeri* Voss, 1956, *Bulletin of Marine Science of the Gulf and Caribbean*, 6(2): 85–178 [120, fig. 7b–f]. [Type locality: 29°11.5'N, 88°07.5'W, Gulf of Mexico, western Central Atlantic Ocean].

**Frequent Synonyms:** None.

**Size:** Mantle length to 97 mm.

**Geographical Distribution:** Gulf of Mexico.

**Habitat and Biology:** Bathyal to mesopelagic.

**Literature:** Vecchione and Young (1999a).

***Nematolampas* Berry, 1913**

*Nematolampas* Berry, 1913c, *Biological Bulletin*, 25(3): 208–212 [208].

**Type Species:** *Nematolampas regalis* Berry, 1913.

***Nematolampas regalis* Berry, 1913****Fig. 259**

*Nematolampas regalis* Berry, 1913, *Biological Bulletin*, 25(3): 208–212. [208]. [Type locality: Sunday Island, Kermadec Islands, southwestern South Pacific Ocean].

**Frequent Synonyms:** None.

**FAO Names:** **En** – Regal firefly squid; **Fr** – Encournet luciole royal; **Sp** – Lucernaluria real.

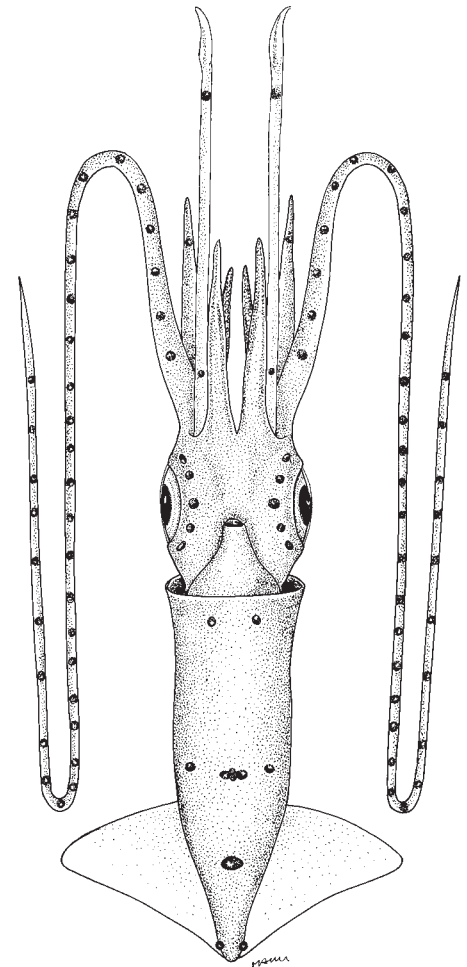
**Diagnostic Features:** Arms III greatly elongated in males, with thread-like distal portions, devoid of suckers. Arms II normal. Arms III with numerous photophores embedded, in linear series. **Males genitalia single.**

**Size:** Mantle length to 30 mm.

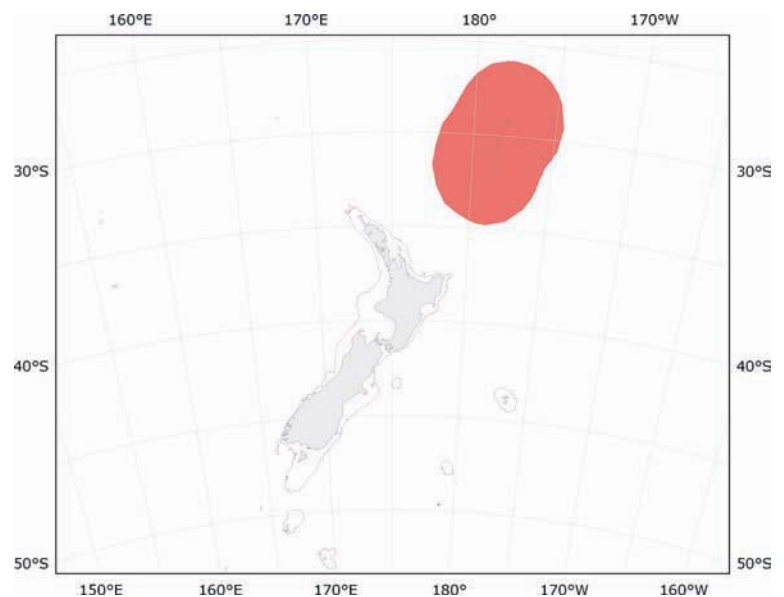
**Geographical Distribution:** Kermadec Islands, southwestern South Pacific Ocean (Fig. 260).

**Remarks:** This species is known from only 3 specimens, 1 washed ashore on the beach; 2 trawled from 48 m.

**Literature:** Vecchione and Young (1999c), Arocha (2003).



ventral view of male

**Fig. 259** *Nematolampas regalis***Fig. 260** *Nematolampas regalis*

■ Known distribution



***Nematolampas venezuelensis* Arocha, 2003**

*Nematolampas venezuelensis* Arocha, 2003, *Bulletin of Marine Science*, 72: 941–953. [941]. [Type locality: 10°55'N, 67°57'W, northeast of Golfo Triste, Venezuela, western Central Atlantic Ocean].

**Size:** The mantle length reaches about 30 mm.

**Geographical Distribution:** Tropical North Atlantic Ocean.

**Literature:** Arocha (2003).

***Selenoteuthis* Voss, 1959**

*Selenoteuthis* Voss, 1959, *Bulletin of Marine Science of the Gulf and Caribbean*, 8(4): 369–389 [370].

**Type Species:** *Selenoteuthis scintillans* Voss, 1959.

***Selenoteuthis scintillans* Voss, 1959****Fig. 261**

*Selenoteuthis scintillans* Voss, 1959, *Bulletin of Marine Science of the Gulf and Caribbean*, 8(4): 369–389 [370, figs. 1a–e]. [Type locality: 26°22'N, 76°10'W, western Central Atlantic Ocean]

**Frequent Synonyms:** None.

**FAO Names:** En – Shining firefly squid; Fr – Encornet luciole scintillant; Sp – Lucernaluria centelleante.

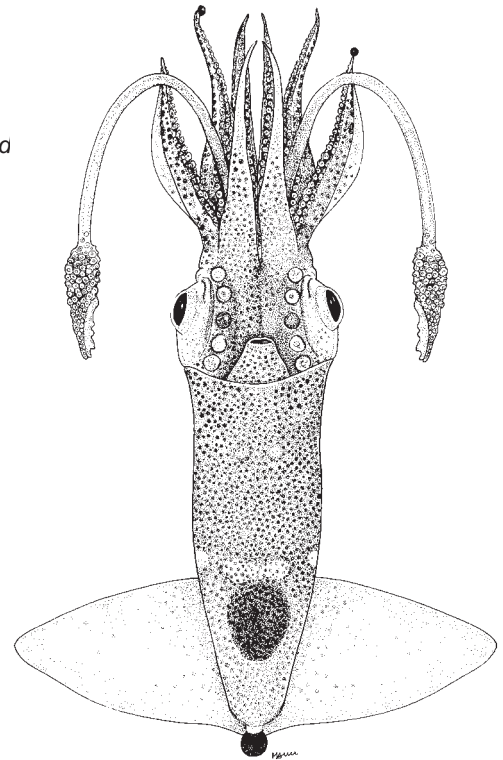
**Diagnostic Features:** One enlarged photophore present at the tip of the tail, larger in males. Five ventral ocular photophores in a straight line; 3 photophores on tentacles: at the base of the tentacle, at midpoint and at the base of the carpus. A peculiar, spherical organ present on each arm II and III in males. **Male genitalia paired.**

**Size:** Mantle length to 45 mm.

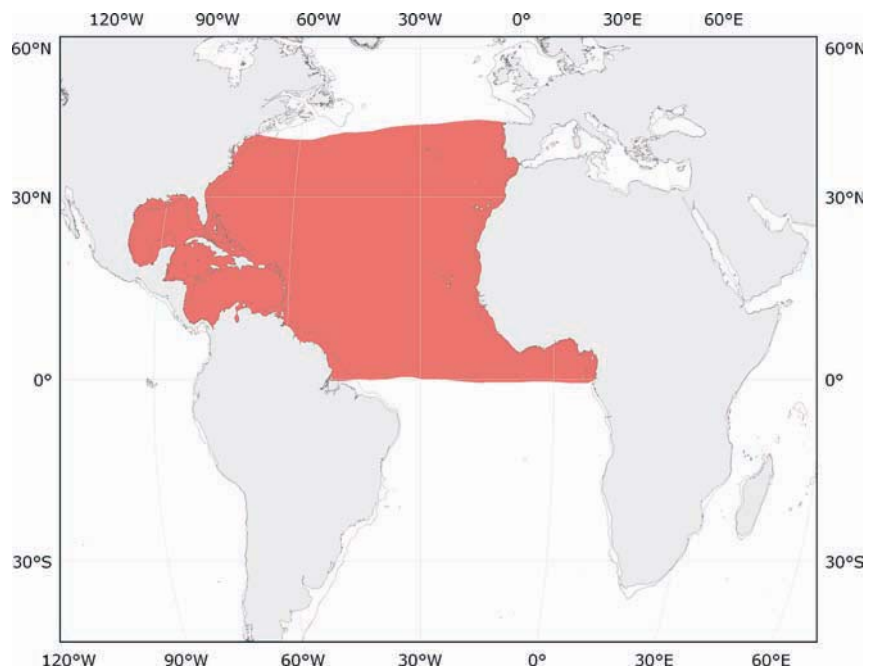
**Geographical Distribution:** Tropical and subtropical western and eastern North Atlantic Ocean, Caribbean Sea, and Gulf of Mexico (Fig. 262).

**Habitat and Biology:** Mesopelagic in daytime, vertical migrator to epipelagic at night.

**Literature:** Voss (1962c), Lea (1985), Voss and Stephen (1992), Vecchione (2008i).



ventral view of male

**Fig. 261** *Selenoteuthis scintillans***Fig. 262** *Selenoteuthis scintillans*

■ Known distribution

Subfamily **LAMPADIOTEUTHINAE** Berry, 1916

Lampadioteuthinae Berry, 1916, *Proceedings of the Academy of Natural Sciences of Philadelphia*, 68: 45–66 [51].

**Type Genus:** *Lampadioteuthis* Berry 1916.

***Lampadioteuthis*** Berry, 1916

*Lampadioteuthis* Berry, 1916, *Proceedings of the Academy of Natural Sciences of Philadelphia*, 68: 45–66 [52].

**Type Species:** *Lampadioteuthis megaleia* Berry, 1916

***Lampadioteuthis megaleia*** Berry, 1916

Fig. 263

*Lampadioteuthis megaleia* Berry, 1916, *Proceedings of the Academy of Natural Sciences of Philadelphia*, 68: 45–66 [52, figs 4–14, pl 8]. [Type locality: Sunday Island, Kermadec Islands, southwestern Pacific Ocean]

**Frequent Synonyms:** None.

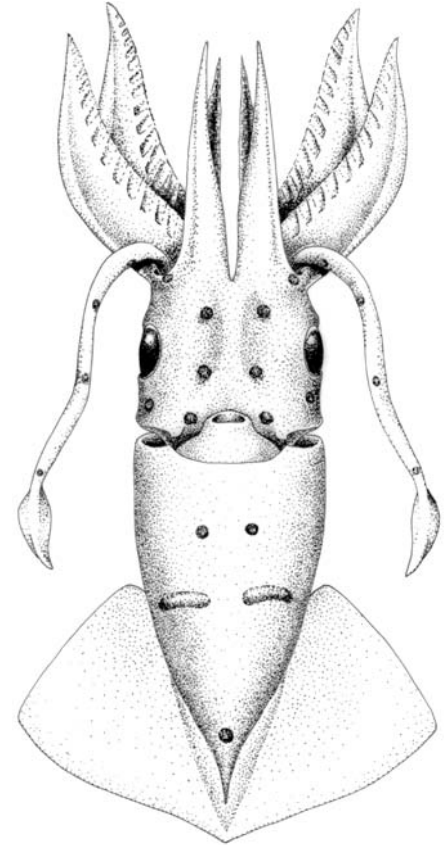
**FAO Names:** En – Wonderful firefly squid; Fr – Encornet luciole merveilleux; Sp – Lucernaluria maravillosa.

**Diagnostic Features:** Four ocular photophores present: 3 ventral in a line, 1 lateral. One stalked photophore at the base of each tentacle. Right ventral arm hectocotylized in males, with an enlarged protective membrane at midpoint. Five visceral photophores present: 2 anal, circular, 2 branchial, transversely elongate, 1 postero-abdominal, circular. Numerous functional chromatophores present; external skin overlying photophores with violet pigment.

**Size:** Mantle length to 40 mm.

**Geographical Distribution:** Subtropical North Atlantic Ocean; Gulf Stream and northern zone of Sargasso Sea; southwestern Pacific Ocean. Upper mesopelagic to epipelagic (Fig. 264).

**Literature:** Voss (1962c), Nesis (1982, 1987), Guerra (1992), Young and Vecchione (2008b).



ventral view of male

Fig. 263 *Lampadioteuthis megaleia*

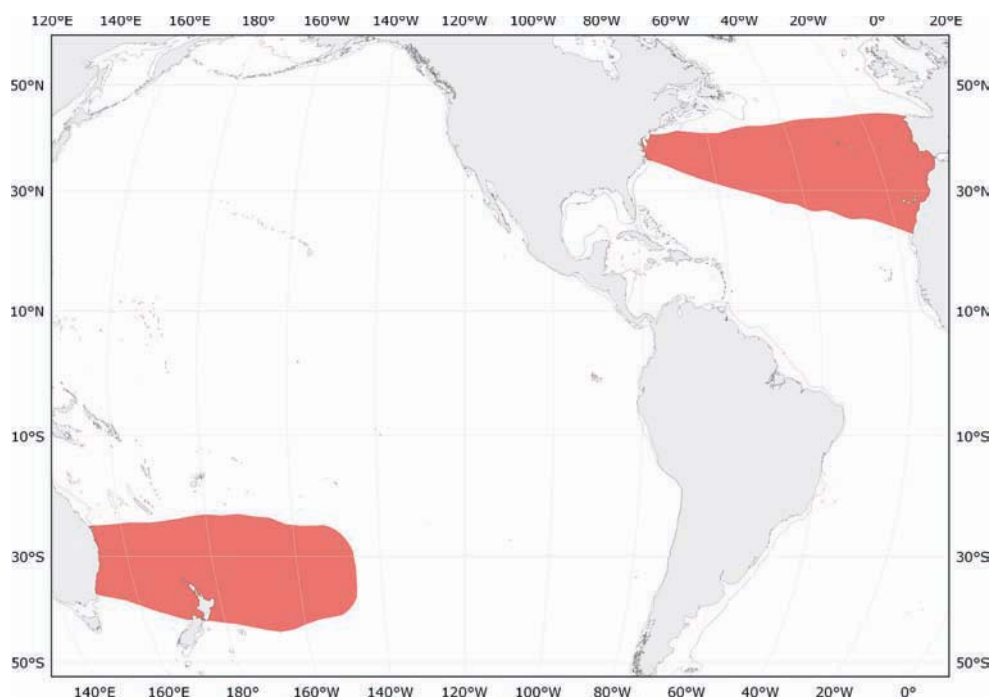


Fig. 264 *Lampadioteuthis megaleia*

Known distribution

**2.18 Family MAGNAPINNIDAE Vecchione and Young, 1998**

by Clyde F.E. Roper and Patrizia Jereb

Magnapinnidae Vecchione and Young, 1998, *South African Journal of Marine Science*, 20: 429–437 [430].

**Type Genus:** *Magnapinna* Vecchione and Young 1998: 430.

**FAO Names:** **En** – Bigfin squids; **Fr** – Encornets ailé; **Sp** – Lurias aladas.

**Diagnostic Features:** Mantle proportionally very small, plump, thinly muscled. **Fins terminal, extremely large, heart-shaped, 3 to 3.3 times longer than the functional mantle**, even longer than entire squid from functional mantle tip to tips of arms and tentacles; width nearly equal to length. **Tentacles short, thick, robust**, with fleshy trabecular membranes; keels and carpal-locking apparatus absent; tentacular club suckers very small, arranged in about 8 transverse series, except fewer at the base; dentition unknown; **distal tips of tentacles very thin, pointed, vermiform, devoid of suckers. Arms short**; basal portion thick, crowded with suckers in series of 2, 3 or 4, but **distally become abruptly vermiform, devoid of suckers**. Funnel-locking cartilage oval, with deep depression anteriorly; tragus and antitragus absent. Buccal connectives attach to ventral margins of Arms IV. Photophores absent (apparently). Ink sac small, with patch of reflective tissue on ventral surface.

**Size:** Only juveniles, paralarvae and damaged specimens none to date.

**Geographical Distribution:** The known specimens were captured in the eastern North Pacific Ocean, in tropical to subtropical waters and in the North Atlantic Ocean (Gulf of Mexico and Azores Islands).

**Interest to Fisheries:** None.

**Remarks:** This remarkable family is monogeneric, known only from a few specimens from the Pacific and Atlantic oceans. The Pacific specimens were caught roughly in a line between offshore California to off the Hawaiian Islands, eastern North Pacific Ocean. One juvenile and the paralarva were caught in plankton nets that fished 0 to 200 m and 0 to 300 m, respectively, while the second juvenile was taken from the stomach of a lancet fish, *Alepisaurus ferox*, a lower epipelagic to upper mesopelagic species. The specimens from the North Atlantic also were young, immature squids. In addition, sightings of a very unusual deep-sea squid have been reported, based on observations, photos and videos taken from submersibles and ROV's (remotely operated vehicles). While none of the animals were captured, the authors of the report tentatively identified them as possibly the adults of Magnapinnidae (Vecchione *et al.*, 2001). Remarkably, no specimens of this size or appearance have ever been captured in deep-sea trawls. Observations were made at depths of 1 940 to 4 734 m, and the size of the largest specimen was estimated to be 7 m total length. These observations came from the western Atlantic Ocean off Brazil, eastern Atlantic Ocean off Africa, Gulf of Mexico, Indian Ocean, and central Pacific Ocean. They suggest the family is circumglobal. The Magnapinnidae belongs to the chiroteuthid group of families.

**Literature:** Vecchione and Young (1998), Guerra *et al.* (2002b), Sweeney and Young (2003q), Vecchione and Young (2006).

***Magnapinna* Vecchione and Young, 1998**

*Magnapinna* Vecchione and Young, 1998, *South African Journal of Marine Science*, 20: 429–437 [430], figs 1–4.

**Type Species:** *Magnapinna pacifica* Vecchione and Young, 1998.

**Frequent Synonyms:** None.

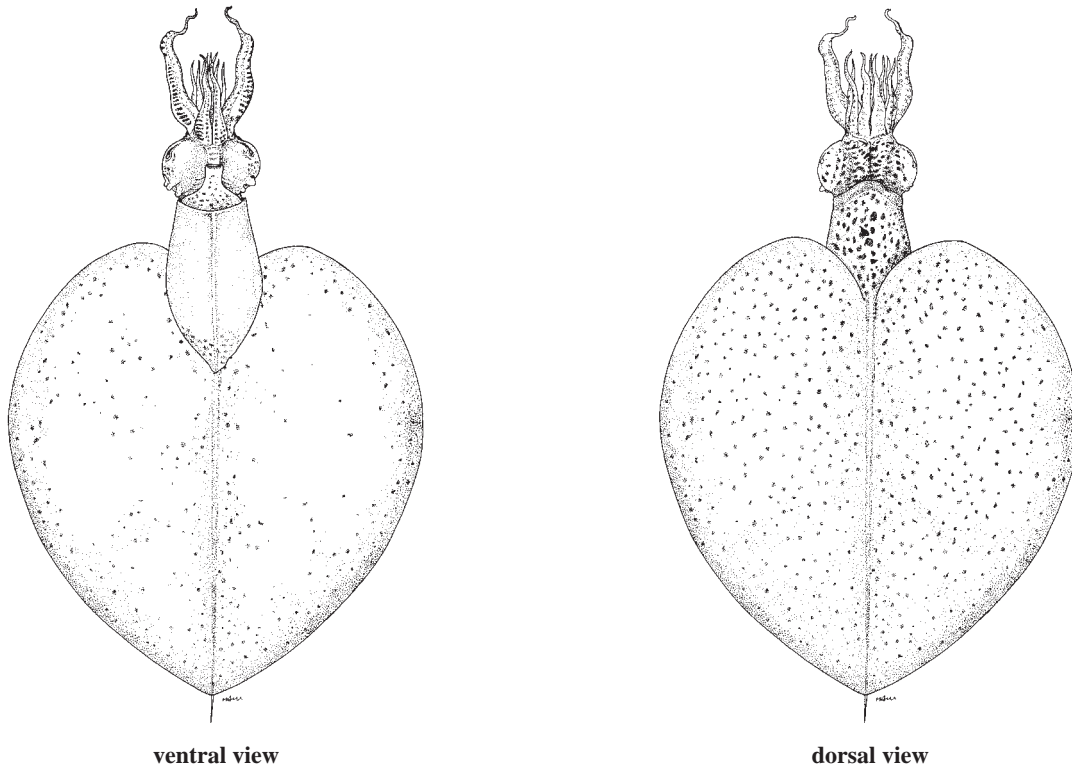
**Remarks:** Currently 5 species are recognized, 1 from the Pacific Ocean and 4 from the Atlantic Ocean. However, only 3 species have been completely described and named: *Magnapinna pacifica* (from the Pacific Ocean), *M. atlantica* and *M. talismani* (from the Atlantic Ocean). Two other potential species have been recognized from the Atlantic, but the specimens are too incomplete to enable full descriptions and names (Vecchione and Young, 2006).

***Magnapinna pacifica* Vecchione and Young, 1998****Fig. 265**

*Magnapinna pacifica* Vecchione and Young, 1998, *South African Journal of Marine Science*, 20: 429–437 [430]. [Type locality: 33°49'N, 121°51'W, western North Pacific Ocean].

**Frequent Synonyms:** None.

**FAO Names:** En – Pacific bigfin squid; Fr – Encornet ailé du Pacifique; Sp – Luria alada del Pacífico.

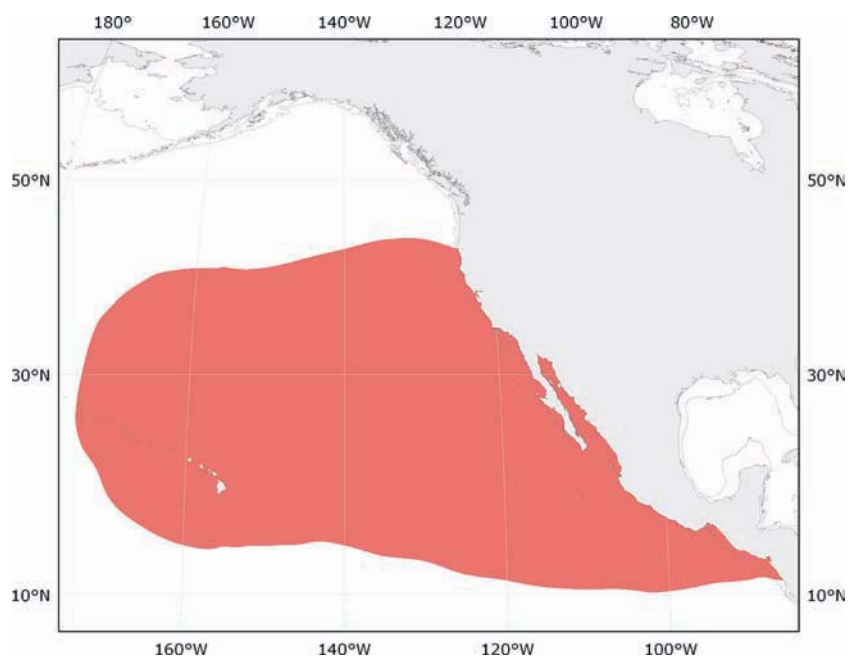


**Fig. 265** *Magnapinna pacifica*

**Size:** Mantle length including huge fin and gladius tip, 53 mm. Only 2 juveniles and 1 paralarva are known.

**Geographical Distribution:** The species occurs in the eastern to central North Pacific Ocean in subtropical to tropical waters (Fig. 266).

**Literature:** Vecchione and Young (1998), Vecchione and Young (2006).



**Fig. 266** *Magnapinna pacifica*

■ Known distribution

***Magnapinna atlantica*** Vecchione and Young, 2006

*Magnapinna atlantica* Vecchione and Young, 2006, *Proceedings of the Biological Society of Washington*, 119(3): 365–372 [367], figs 1–3, 4f. [Type locality: 27°09'N, 86°07'W, Gulf of Mexico, western Equatorial Atlantic Ocean].

**Frequent Synonyms:** None.

**Size:** Mantle length of the 2 known specimens is 53 and 59 mm.

**Geographical Distribution:** North Atlantic: Gulf of Mexico, mid-Atlantic Ridge.

**Literature:** Vecchione and Young (2006).

***Magnapinna talismani*** (Fischer and Joubin, 1907)

*Mastigoteuthis talismani* Fischer and Joubin, 1907, *Expéditions scientifiques du Travailleur et du Talisman – Céphalopodes*, 8: 313–353 [342]. [Type locality: 34°46'N, 36°11'W, Azores Islands, eastern Atlantic Ocean].

**Frequent Synonyms:** *Mastigoteuthis talismani* Fischer and Joubin, 1907.

**Size:** Mantle length 61 mm.

**Geographical Distribution:** Known from a single specimen taken from south of the Azores, North Atlantic Ocean.

**Remarks:** *Magnapinna talismani* was originally described from a single damaged specimen that came from south of the Azores, North Atlantic, very near the capture site of *M. atlantica* and the specimens belonging to the unnamed *Magnapinna* species. The identity of *M. talismani* is uncertain, and the poor condition of the holotype which has lost most species-level characters makes comparisons with other species difficult. However, several features suggest that it is not conspecific with *M. atlantica* Vecchione and Young (2006). Thus *M. talismani* was originally placed in the genus *Chiroteuthopsis* which is a junior synonym of *Mastigoteuthis*, and was placed in *Magnapinna* by Vecchione and Young (2006).

**Literature:** Vecchione and Young (2006).

**2.19 Family MASTIGOTEUTHIDAE Verrill, 1881**

by Clyde F.E. Roper and Patrizia Jereb

Mastigoteuthidae Verrill, 1881a, *Transactions of the Connecticut Academy of Sciences*, 5(6): 259–446 [430].**Type Genus:** *Mastigoteuthis* Verrill, 1881.**FAO Names:** En – Whiplash squids; Fr – Loutènes filamentoux; Sp – Flageloluria.

**Diagnostic Features:** Mantle weakly muscular to semigelatinous; anterior portion cylindrical, posterior part tapered, conical. Fins very large, with half or more of their length posterior to the muscular part of the mantle; oval to round, heart- or diamond-shaped, usually longer than 50% of mantle length. Ventral arms very elongate, thickest of all arms, possess expanded lateral membranes; arm suckers biserial, no arm hooks. Tentacles vermiform, extremely long, slender, whip-like, weakly muscled (often lost during capture); transverse muscles used to rapidly extend/deploy tentacles, e.g. for prey capture, are nearly absent; clubs not expanded or only slightly expanded; club elongate with very numerous (often thousands) small to microscopic suckers arranged in many irregular series (usually more than 15, even more than 30 in some species); club without keels or locking (fixing) apparatus. Buccal membrane with seven lappets; buccal connectives attach to ventral borders of arms IV. Funnel-locking apparatus ear-shaped or oval with various knobs (tragus, antitragus) that affect the shape of the depression in the funnel component in different species; mantle component with nose-shaped or L-shaped ridges. Gladius narrow, with long conus that forms a needle-like tail spike that extends posterior to terminus of fins. Coloration an overall reddish to maroon cutaneous pigmentation, much of which not incorporated in chromatophores but dispersed in other integumental cells; many typical chromatophores usually present, but their mobility is uncertain. Photophores variously present in most species: some species with numerous minute, round cutaneous organs embedded in ventral surface of mantle, head and arms; 1 on the anteroventral edge of eyelid; some with only eyelid photophores and 1 (*Mastigoteuthis hjorti*) with 2 photophores on ventral surface of eyeball.

**Size:** Medium to large-sized squids, maximum mantle length to 1 m.

**Habitat and Biology:** Deep sea pelagic or benthopelagic squids. Paralarvae do not exhibit a high degree of sudden (breakpoint) morphological change during early ontogeny; tentacle length increases disproportionately rapidly as a support for the “dangling tentacle” feeding technique observed *in situ* on adult *Mastigoteuthis hjorti* and presumed for juveniles. Observations from submersibles recorded mastigoteuthid squids in close proximity to the bottom, oriented vertically with head down and tentacles extended to the sediment, presumably to capture copepods and other small plankton of the epibenthic zooplankton; position was maintained by gentle undulations of the very large fins. The tentacles are supported proximally by the tentacular sheath of arms IV and are held apart in the “tuning fork” posture. Additional observations from submersibles at 700 to 1 000 m support hypotheses that the large fins provide propulsion. Tentacular suckers have a weak release-mechanism (they adhere like fly paper to anything they touch) and retain a sensory function; these morphologies enable the species to forage in the relatively food-rich zone on and immediately above the bottom. Closing net captures of *Mastigoteuthis* species have helped to define their diel vertical distributions: in general, minor diel vertical shifting occurs. Observations from submersibles, as well as morphological and histological examination of the giant nerve fibers in the mantle indicate the absence of a strong, rapid jet propulsion capability. Tissues of the mantle, head and especially the large ventral arms are vesiculate and contain ammonium ions in the tissue fluid, providing near-neutral buoyancy; the positive buoyancy of the anterior portion is overcome by complex rhythmic wave-like undulations of the fins to maintain the head-down posture during feeding.

**Interest to Fisheries:** No direct interest to fisheries exists for any of the species. However, Mastigoteuthids are occasional or important prey species for numerous oceanic predators, among them the following: lancetfish, swordfish, blue shark and cetaceans, such as, for example, sperm whales, dwarf sperm whale, long-finned pilot whale, southern bottlenose whale, Hubb’s beaked whale.

**Remarks:** The Mastigoteuthidae is among the most taxonomically confused of all deep-sea squid families, principally because many characters are based on the structures frequently lost during capture, e.g. tentacles and skin photophores. Further, the family includes many poorly known species, some described only from one or very few, often badly damaged, specimens, or from paralarvae.

Several genera and subgenera have been erected for various entities of mastigoteuthids, and the systematics of the family has been in a state of flux for many years. In recent times, Salcedo-Vargas and Okutani (1994) proposed a generic and subgeneric classification based on actual or presumed morphological characteristics. Considerable modification of this classification subsequently was proposed by Salcedo-Vargas (1997) and former subgeneric names were dropped. Extensive systematic and nomenclatural studies on the family and new findings are due to Vecchione *et al.* (2007a) and Young *et al.* (2008a, b). Phylogenetic data also are available for a few species and genetic studies are in progress (e.g. Young *et al.*, pers.comm.).

In the absence of a comprehensive systematic monograph and waiting until our knowledge has increased to the point where a full phylogenetic study can be made, we agree with Vecchione *et al.* (2007a) on the fact that modifying the classification within the family currently is premature. Consequently, in this Catalogue we consider the family Mastigoteuthidae to be monogeneric, with the single genus *Mastigoteuthis*, comprised of 13 valid nominal species; other species, of doubtful validity or uncertain status, are listed at the end of the section. All nominal genera and species are listed by Sweeney and Young (2003r).

Among the characters most frequently used to distinguish species are ramifications of the familial characters. These include, but are not limited to: variations in arm IV dimensions; tentacular club relative length and degree of expansion, numbers of suckers in transverse series, size and dentition of inner and outer sucker rings, presence of enlarged central club sucker and the proportion of tentacle club length they occupy; number and configuration of knobs on funnel-locking apparatus (including tragus and antitragus), depth of depression in funnel component of locking apparatus; presence/absence of photophores, their number, configuration, distribution and size on integument of mantle, head, arms; presence/absence, size and shape of

photophores on anteroventral eyelid; presence/absence, numbers, configuration of photophores on ventral surface of eye ball; arm sucker dentition; presence/absence of integumentary tubercles on mantle; relative fin length to mantle length; relative fin width to fin length, relative length of "tail spike" to mantle length .

Because so many of the nominal species are poorly known, it is not possible to provide a key to the species of Mastigoteuthidae. Instead, a breakdown into species and groups of species that share a few characters is given (Vecchione *et al.*, 2007a).

### Species groups

1. *Mastigoteuthis agassizii* group: *M. agassizii*, *M. dentata*, *M. psychrophila*

Characteristics:

- a. Numerous, small but easily seen integumental photophores.
- b. Broadly spaced chromatophores.

2. *Mastigoteuthis cordiformis*

Characteristics:

- a. No photophores.
- b. Club with very large suckers (about 0.5 mm diameter) at proximal end.
- c. Skin tubercles present.

3. *Mastigoteuthis danae*

Characteristics:

- a. Large integumentary tubercles in advanced paralarvae.
- b. Fins longer than wide.

4. *Mastigoteuthis glaukopsis* group: *M. glaukopsis*, *M. atlantica*, *M. famelica*

Characteristics:

- a. Large eyelid photophore present.
- b. No other photophores present.

5. *Mastigoteuthis hjorti*

Characteristics:

- a. Two photophores on each eyeball.
- b. Very large fins (fin length about 90% of mantle length).

6. *Mastigoteuthis magna* group: *M. magna*, *M. microlucens*

Characteristics:

- a. Flask-shaped funnel-locking apparatus.
- b. Very small (ca. 0.05 mm diameter) tentacular club suckers.

7. *Mastigoteuthis pyrodes*

Characteristics:

- a. Numerous, small, but easily seen integumental photophores and a much larger photophore on each eyelid.
- b. Funnel-locking apparatus broad, without antitragus and with undercut posterior margin and tragus.
- c. Large club suckers (about 0.3 mm diameter).

8. *Mastigoteuthis tyroi*

Characteristics:

- a. Clubs expanded in paralarval stage.
- b. Integumentary tubercles present in paralarval stage.

**Literature:** Roper and Lu (1990), Vecchione and Roper (1992 [1991]), Salcedo-Vargas and Okutani (1994), Salcedo-Vargas (1995), Salcedo-Vargas and Young (1996), Roper and Vecchione (1997), Salcedo-Vargas (1997), Sweeney and Young (2003r), Vecchione *et al.* (2002, 2007a).

***Mastigoteuthis* Verrill, 1881****Plate VIII, 45**

*Mastigoteuthis* Verrill, 1881b, *Bulletin of the Museum of Comparative Zoology*, 8(5): 99-116. [100].

**Type species:** *Mastigoteuthis agassizii* Verrill, 1881 [100].

**Frequent synonyms:** *Chirtoteuthopsis* Pfeffer, 1900; *Echinoteuthis* Joubin, 1933; *Idioteuthis* Salcedo-Vargas and Okutani, 1994 (uncertain status).

***Mastigoteuthis agassizii* Verrill, 1881****Fig. 267**

*Mastigoteuthis agassizii* Verrill, 1881b, *Bulletin of the Museum of Comparative Zoology*, 8(5): 99-116 [100]. [Type locality: 33°35'N, 76°00'W and 34°28'N, 75°22'W, western North Atlantic Ocean].

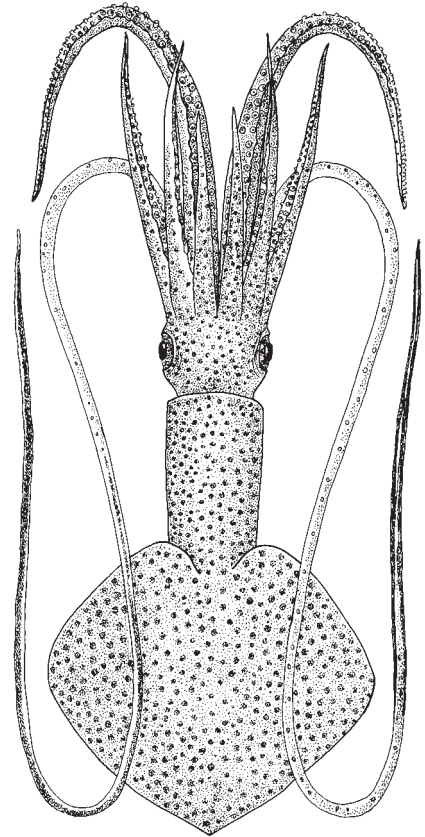
**FAO Names:** **En** – Agassizi's whiplash squid; **Fr** – Loutène filamentoux de Agassizi; **Sp** – Flageloluria de Agassizi.

**Size:** Maximum mantle length reaches 100 mm.

**Geographical Distribution:** Central North Atlantic ocean (Fig. 268).

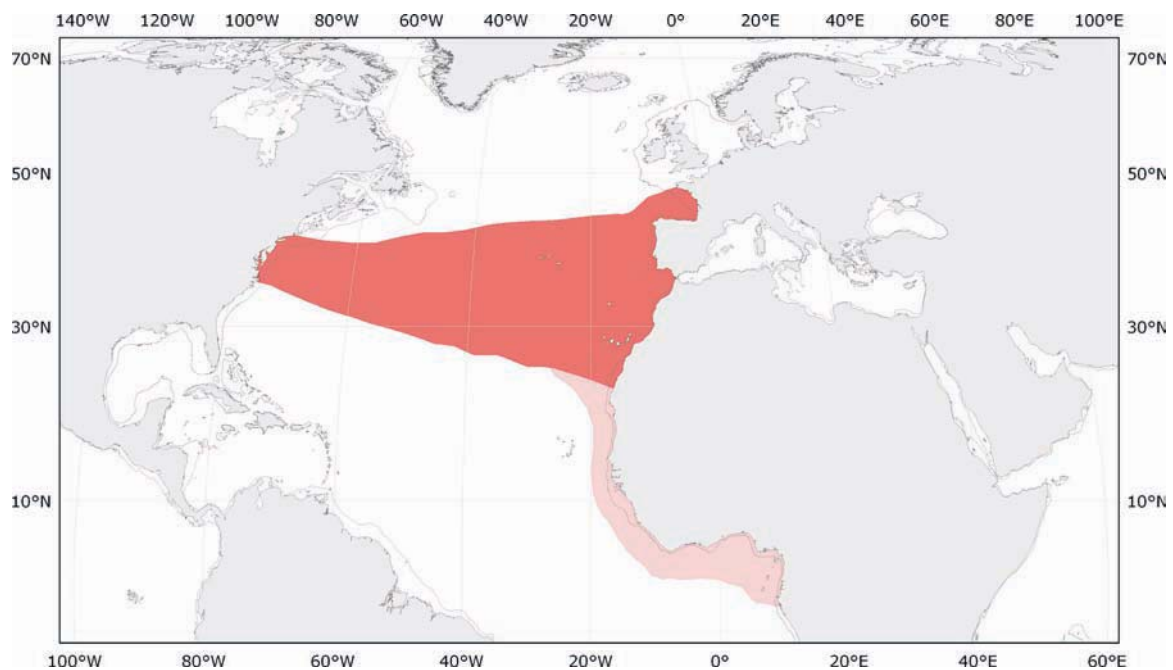
**Remarks:** This species may have 2 forms, a north temperate/boreal form and a tropical form that cannot be separated with any certainty at present (Vecchione and Young 2007a). The type locality of *Mastigoteuthis agassizii* (about 34°N) in warm temperate waters off the eastern United States is a region where the boreal and tropical forms of *M. agassizii* could overlap. Two other names are available for the temperate/boreal form if it proves to be distinct: *M. grimaldii* described by Joubin (1895b) from a damaged 38 mm mantle length squid taken near the Azores at 39°43'N, 33°22'W and *M. schmidtii* described by Degner (1925) from a 46 mm mantle length squid in excellent condition taken from the Bay of Biscay at 46°30'N, 07°00'W. One name is available for the tropical form if it proves to be distinct: *M. flammea* described by Chun (1910) from 2 small squid (27 and 35 mm ML) captured in the eastern tropical Atlantic (0°25'N, 7°0'E and 1°14'N, 2°10'W), both of which had lost their tentacles.

**Literature:** Shea and Vecchione (2006), Vecchione and Young (2007a), Young and Vecchione (2007c).



dorsal view

**Fig. 267** *Mastigoteuthis agassizii*



**Fig. 268** *Mastigoteuthis agassizii*

Known distribution

Probable presence



## SPECIES ACCOUNTS

The species listed here are those defined in Vecchione *et al.* (2007a); since these authors list species groups as well as single species, the 13 named species are arranged alphabetically here.

***Mastigoteuthis atlantica*** Joubin, 1933

*Mastigoteuthis atlantica* Joubin, 1933, *Annales de l'Institut Océanographique*, 13(1): 1–49 [20]. [Type locality: 46°28'N, 08°01'W, near the Bay of Biscay, eastern North Atlantic Ocean].

**Size:** Maximum mantle length reaches 120 mm.

**Geographical Distribution:** This species occurs in the eastern North and South Atlantic Ocean.

**Literature:** Guerra (1992), Vecchione and Young (2007b).

***Mastigoteuthis cordiformis*** Chun, 1908

*Mastigoteuthis cordiformis* Chun, 1908, *Zoologischer Anzeiger*, 33(2): 86–89 [88]. [Type locality: 0°15'N, 98°08'E, off Nias Island, Sumatra, Indonesia, eastern Indian Ocean].

**Size:** Maximum mantle length known to reach 700 mm. (Unpublished reports record it to 1 m or more).

**Geographical Distribution:** Broadly distributed on the continental slope in the Indo-West Pacific, Indonesia, the Philippines, southern Japanese waters and of the Northwest Slope, Australia, the Tasman Sea and New Zealand waters.

**Habitat and Biology:** This wide-ranging species lives in tropical and subtropical waters to depths of 1 000 m and undergoes diel vertical migration.

**Literature:** Roper and Lu (1990), Dunning (1998g), Young and Vecchione (2008d,e).

***Mastigoteuthis danae*** (Joubin, 1933)

*Echinoteuthis danae* (Joubin, 1933), *Annales de l'Institut Océanographique*, 13(1): 1–49 [13]. [Type locality: 34°40'N, 33°16'W, southwest of the Azores Islands, eastern North Atlantic Ocean].

**Size:** Maximum mantle length known to 30 mm.

**Geographical Distribution:** Eastern central North Atlantic Ocean in subtropical waters. Other localities near the Antilles and east of the Canary Islands.

**Remarks:** Known only from a few paralarval and juvenile specimens.

**Literature:** Vecchione and Young (2007c).

***Mastigoteuthis dentata*** Hoyle, 1904

*Mastigoteuthis dentata* Hoyle, 1904, *Bulletin of the Museum of Comparative Zoology*, 43(1): 1–72 [34]. [Type locality: 07°21'N, 79°35'W off Cape Mala, Panama, Gulf of Panama, eastern North Pacific Ocean].

**Size:** Maximum mantle length known to reach 72 mm.

**Geographical Distribution:** Tropical eastern and western North and South Pacific Ocean, waters off Panama and the Galapagos Islands. Indian Ocean from southern Africa.

**Literature:** Young and Vecchione (2007c).

***Mastigoteuthis famelica*** (Berry, 1909)

*Chiroteuthis famelica* Berry, 1909, *Proceedings of the United States National Museum*, 37(1713): 407–419 [414]. [Type locality: off Kauai Island, Hawaiian Islands, central North Pacific Ocean].

**Size:** Maximum mantle length reported is in excess of 300 mm.

**Geographical Distribution:** Restricted to the central North Pacific Ocean.

**Habitat and Biology:** The species occupies the zone of about 675 m to 800 m, both day and night.

**Literature:** Roper and Young (1975), Young (2008b).

***Mastigoteuthis glaukopsis*** Chun, 1908

*Mastigoteuthis glaukopsis* Chun, 1908, *Zoologischer Anzeiger*, 33(2): 86–89 [88]. [Type locality: 04°63'N [sic], 48°37'E, Arabian Sea, Indian Ocean].

**Size:** Maximum mantle length known to reach 100 mm.

**Geographical Distribution:** The distribution of the species seems very disjunct. It has been reported from the western North Pacific Ocean off Japan, the northwestern Indian Ocean, Arabian Sea off Somalia, southwestern Indian Ocean, southeastern South Atlantic Ocean, off South Africa and eastern North Atlantic Ocean off Spain and Portugal.

**Literature:** Kubodera (*in* Okutani) (2000), Young and Vecchione (2007d).

***Mastigoteuthis hjorti*** Chun, 1913

Plate VIII, 46

*Mastigoteuthis hjorti* Chun, 1913, *Report on the Scientific Results of the Michael Sars North Atlantic Deep-sea Expedition 1910*, 3(1): 1–28 [8]. [Type locality: 31°24'N, 34°47'W in the open tropical central North Atlantic Ocean].

**Size:** Maximum mantle length reaches 100 mm.

**Geographical Distribution:** Very broadly distributed, possibly as a tropical-subtropical circumglobal species with northern limits of about 40°N and southern boundaries undetermined. It occurs in the North Atlantic Ocean from eastern regions of the Gulf of Mexico, northward to Bermuda and to the Gulf of Maine, in the western North Atlantic Ocean, and in the eastern Atlantic Ocean, off South Africa, the central Pacific Ocean and the Indian Ocean.

**Literature:** Rancurel (1973a), Roper and Lu (1990), Vecchione and Roper (1992 [1991]), Nesis (1999b), Vecchione and Young (2007d).

***Mastigoteuthis magna*** Joubin, 1913

*Mastigoteuthis magna* Joubin, 1913, *Bulletin de l'Institut Océanographique, Monaco*, 275: 1–11 [2]. [Type locality: 31°44.5'N, 42°39'W, in the mid-North Atlantic Ocean].

**Size:** Maximum mantle length known 160 mm.

**Geographical Distribution:** *Mastigoteuthis magna* appears to have a disjunct distribution. It occurs commonly throughout the western central North Atlantic, from the Bahamas, off Cape Hatteras, North Carolina, and northward, as well as along a transect in the eastern central Atlantic at 30°W. The species also occurs over deep water in the western North Pacific Ocean off Japan.

**Literature:** Lu and Roper (1979), Vecchione and Roper (1992 [1991]), Roper and Vecchione (1997), Shea and Vecchione (2002), Vecchione and Young (2007e).

***Mastigoteuthis microlucens* Young, Lindgren and Vecchione 2008**

*Mastigoteuthis microlucens* Young, Lindgren and Vecchione 2008a, *Proc. Biol. Soc. Wash.*, 121(2): 276–282. [Type locality: Hawaiian Archipelago to about ca. 26°N].

**Size:** Maximum mantle length 215 mm.

**Geographical Distribution:** Hawaiian Island, tropical Pacific Ocean.

**Remarks:** This is the most common species of *Mastigoteuthis* around the main Hawaiian Islands. It has numerous tiny photophores that lie beneath the outer layer of integumental chromatophores. The photophores are so small that they cannot be recognized as photophores without the aid of a microscope.

**Literature:** Young *et al.* (2008a,b), Young and Vecchione (2008e).

***Mastigoteuthis psychrophila* Nesis, 1977**

*Mastigoteuthis psychrophila* Nesis, 1977b, *Zoologicheskij Zhurnal*, 65(6): 835–842 [835]. [Type locality: 59°26'S, 158°36'E, Antarctic Ocean waters south of eastern Australia at 500 m at night].

**Size:** Maximum mantle length is 150 mm.

**Geographical Distribution:** Circumpolar in the sub-Antarctic and Antarctic waters, with records from mesopelagic to bathypelagic depths over sub-Antarctic and Antarctic island trenches, e.g. South Sandwich, Macquarie and Hjort Trenches and off South Georgia's northwest slope.

**Literature:** Nesis (1982, 1987), Lu and Williams (1994a), Young and Vecchione (2007e).

***Mastigoteuthis pyrodes* Young, 1972**

*Mastigoteuthis pyrodes* Young, 1972a, *Smithsonian Contributions to Zoology*, 97: 1–159 [64]. [Type locality: 33°32'N, 118°23'W, far eastern North Pacific Ocean].

**Size:** Maximum mantle length is known to reach 170 mm.

**Geographical Distribution:** Limited to the California Current waters off Southern California, eastern North Pacific Ocean.

**Remarks:** This is the only species of *Mastigoteuthis* known to occur in eastern North Pacific waters.

**Literature:** Roper and Young (1975), Young and Vecchione (2007f).

**DOUBTFUL AND QUESTIONABLE SPECIES FOR WHICH ADDITIONAL MATERIAL, NEW DATA AND FURTHER RESEARCH ARE NECESSARY BEFORE THEY CAN BE CONSIDERED VALID**

***Mastigoteuthis hastula* (Berry, 1920)**

*Chiroteuthoides hastula* Berry, 1920a, *Proceedings of the United States National Museum*, 58(2335): 293–300, 1 plate [293, pl. 16 fig. 3]. [Type locality: 28°59'N, 69°22'W, Sargasso Sea, western North Atlantic Ocean].

***Mastigoteuthis inermis* Rancurel, 1972**

*Mastigoteuthis inermis* Rancurel, 1972, *Bulletin de la Société Zoologique de France*, 97(1): 25–34 [25]. [Type locality: 4.5°N, 4°W, Gulf of Guinea, eastern tropical North Atlantic Ocean].

***Mastigoteuthis iselini* MacDonald and Clench, 1934**

*Mastigoteuthis iselini* MacDonald and Clench, 1934, *Occasional Papers of the Boston Society of Natural History*, 8: 145–152 [150]. [Type locality: 39°04'N, 71°29'W, western North Atlantic Ocean].

***Mastigoteuthis latipinna* Sasaki, 1916**

*Mastigoteuthis latipinna* Sasaki, 1916, *Annotationes Zoologicae Japonenses*, 9(2): 89–120 [108]. [Type locality: 'outside' the Okinose Bank, Sagami Sea, Japan, western North Pacific Ocean].

***Mastigoteuthis okutanii* Salcedo-Vargas, 1997**

*Mastigoteuthis okutanii* Salcedo-Vargas, 1997, *Beaufortia*, 47: 91–108 [101]. [Type locality: approximately 51°N, 09°E, off the coast of Somalia, Arabian Sea, western Indian Ocean].

***Mastigoteuthis tyroi* Salcedo-Vargas, 1997**

*Mastigoteuthis tyroi* Salcedo-Vargas, 1997, *Beaufortia*, 47(3): 91–108 [99]. [Type locality: approximately 08.1°N, 56.1°E, off the coast of Somalia, Arabian Sea, northwestern Indian Ocean].

**Size:** Maximum mantle length known is 15 mm.

**Geographical Distribution:** Arabian Sea, northwestern Indian Ocean.

**Remarks:** The holotype, a paralarva, is the only specimen known, so the status of the species requires additional material, at least of the subadult stage.

**Literature:** Salcedo-Vargas and Young (2007).

**2.20 Family NEOTEUTHIDAE Naef, 1921**

by Clyde F.E. Roper and Patrizia Jereb

Neoteuthidae Naef, 1921a, *Mitteilungen aus der Zoologischen Station zu Neapel*, 22(16): 527–542 [540].**Type Genus:** *Neoteuthis* Naef, 1921: 540.**FAO Names:** En – Neosquids; Fr – Loutènes nouveau; Sp – Neolurias.

**Diagnostic Features:** Small- to medium-sized squids (to 270 mm mantle length). Mantle medium to elongate to very narrow, conical; weakly muscled. **Fins unusual with posterior fin lobes present, anterior lobes absent;** attach laterally onto mantle muscle. **Head relatively enlarged, wider than mantle.** Tentacular clubs with dorsal keels, terminal pads and carpal/stalk locking apparatus; **clubs divided into distinct dual sections: 1) the proximal manus with extremely numerous closely-packed, minute suckers in irregular, numerous transverse series (more than 10); 2) the distal manus with 4 series of suckers, somewhat larger to much larger than the distal manal suckers; dactylus with smaller suckers than distal manus, in 4 transverse series** (reduced near tip); club locking apparatus extends along proximal manus and in most genera along the tentacular stalk (*Neoteuthis* excepted). Arms with biserial suckers, some develop hooks in adults. Buccal connectives attach to dorsal margins of arms IV. Funnel-locking apparatus a simple, straight groove. Fins variable among genera; length 35 to 70% of mantle length; anterior fin lobes absent, posterior fin lobes present, free; fins usually attach to dorsolateral surface of mantle, especially anteriorly, not attached along midline of mantle. Aboral surfaces of arms and the head and mantle covered with thick white tissue in most genera. **Photophores absent.**

**Size:** Small- to medium-sized squids up to 270 mm mantle length.**Geographical Distribution:** Variously distributed in the North and South Atlantic oceans, North and South Pacific oceans and Antarctic waters, in water masses that range from subtropical to Antarctic.

**Habitat and Biology:** Relatively few specimens are available for most species, but in general the paralarvae tend to be captured in the upper several hundred metres, while the subadults and adults tend to be captured in the mesopelagic and upper bathypelagic zones, 1 000 to 2 000 m. *Alluroteuthis antarcticus* seems to be very abundant, as its young are reported as prey to albatrosses and emperor and king penguins, while southern elephant seals, southern bottlenose whales and sperm whales prey on adults. All species appear to have a buoyancy mechanism; in *A. antarcticus* it is known to be ammoniacal in nature.

**Interest to Fisheries:** None. The relatively small size of most species and, especially the ammoniacal nature of the mantle tissue, preclude an interest in utilization at this time. *Alluroteuthis antarcticus* might be an exception, because of its size (270 mm mantle length) and abundance.

**Local Names:** USA: New squids.

**Remarks:** The Neoteuthidae currently is recognized to consist of 4 genera, each with a single species: *Alluroteuthis*, *Narrowteuthis*, *Neoteuthis* and *Nototeuthis*. The long-used family designation of Alluroteuthidae was corrected to Neoteuthidae based on priority (Voss, 1967a).

**Literature:** Roper *et al.* (1969b), Nesis (1982, 1987), Nesis and Nikitina (1986b), Vecchione and Roper (1992 [1991]), Nesis (1999b), Sweeney and Young (2003s), Vecchione and Young (2003a,b), Young and Vecchione (2005a,b), Vecchione and Young (2008c).

**Table 4**  
Comparison of characters among genera<sup>1/</sup>

Genus	Club length	Proximalmanus length relative to remaining distal club length	Tentacle locking apparatus	Manal sucker laterally compressed	Two greatly enlarged suckers on distal manus	Arm sucker dentition	Fin length
<i>Alluroteuthis</i>	33%	<1/3 X	Manus, stalk	No	No	Single large tooth	35–40% ML
<i>Narrowteuthis</i>	20% ML	1.1 X	Manus, stalk	Yes	No	Smooth	35% ML
<i>Neoteuthis</i>	60% ML	4.8 X	Manus	No	No	Truncated teeth	70% ML
<i>Nototeuthis</i>	37% ML	3/4 X	Manus, stalk	No	Yes	Truncated teeth	60% ML

<sup>1/</sup> Vecchione and Young (2003a, Tree of Life).

***Neoteuthis* Naef, 1921**

*Neoteuthis* Naef, 1921a, *Mitteilungen aus der Zoologischen Station zu Neapel*, 22(16): 527–542. [540].

**Type Species:** *Neoteuthis thielei* Naef, 1921.

**Frequent Synonyms:** None.

***Neoteuthis thielei* Naef, 1921**

*Neoteuthis thielei* Naef, 1921, *Mitteilungen aus der Zoologischen Station zu Neapel*, 22(16): 527–542. [540]. [Type location: 32°08'S, 08°28'W, Benguela Current, west of South Africa, South Atlantic Ocean].

**Frequent Synonyms:** None.

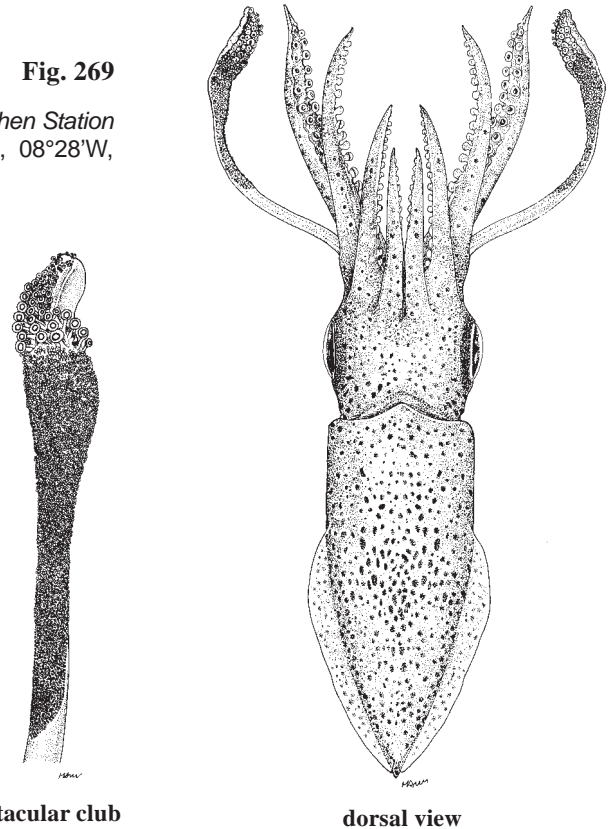
**FAO Names:** **En** – Thiele's new squid; **Fr** – Loutène nouveau de Thiele; **Sp** – Neoluria de Thiele.

**Size:** 100 mm mantle length.

**Geographical Distribution:** South Atlantic Ocean, North Atlantic Ocean and North Pacific Ocean, north of Hawaiian Islands.(Fig. 270).

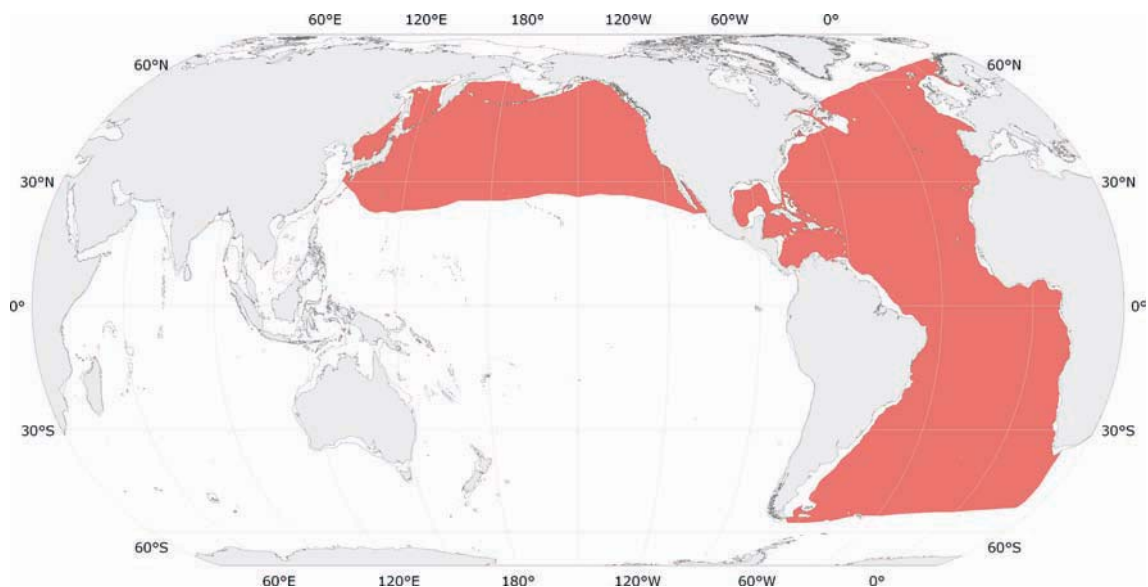
**Habitat and Biology:** Paralarvae and juveniles epipelagic to mesopelagic; adults are mesopelagic to bathypelagic.

**Literature:** Vecchione and Young (2003a). See family literature list.

**Fig. 269**

tentacular club

dorsal view

**Fig. 269** *Neoteuthis thielei***Fig. 270** *Neoteuthis thielei*

Known distribution

**Alluroteuthis** Odhner, 1923

*Alluroteuthis* Odhner, 1923, *Zoological Results of the Swedish Antarctic Expedition, 1901–1903*, 1(4): 1–7 [2].

**Type Species:** *Alluroteuthis antarcticus* Odhner, 1923.

**Frequent Synonyms:** None.

**Alluroteuthis antarcticus** Odhner, 1923

Fig. 271

*Alluroteuthis antarcticus* Odhner, 1923, *Zoological Results of the Swedish Antarctic Expedition, 1901–1903*, 1(4): 1–7. [2]. [Type locality: 63°25'S, 45°39'W, Weddell Sea, Antarctic Ocean].

**Frequent Synonyms:** *Parateuthis tunicata* Thiele, 1920.

**FAO Names:** **En** – Antarctic new squid; **Fr** – Loutène australe; **Sp** – Neoluria antártica.

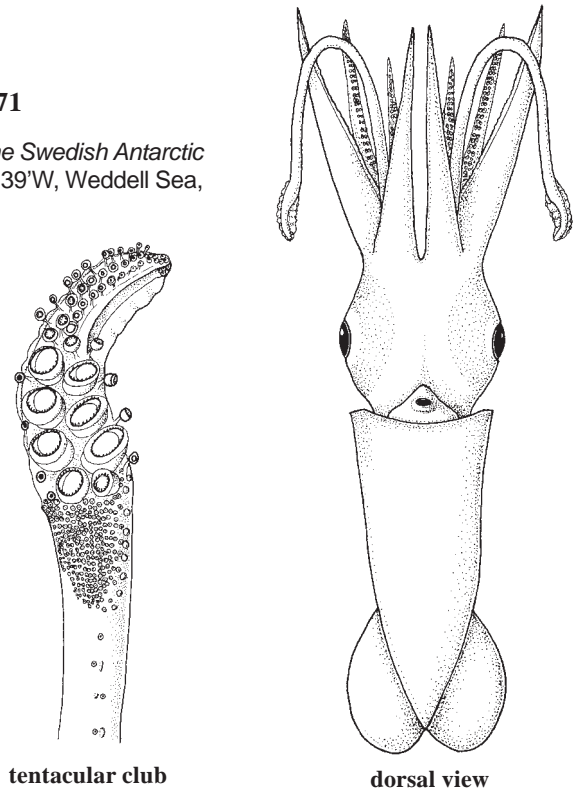
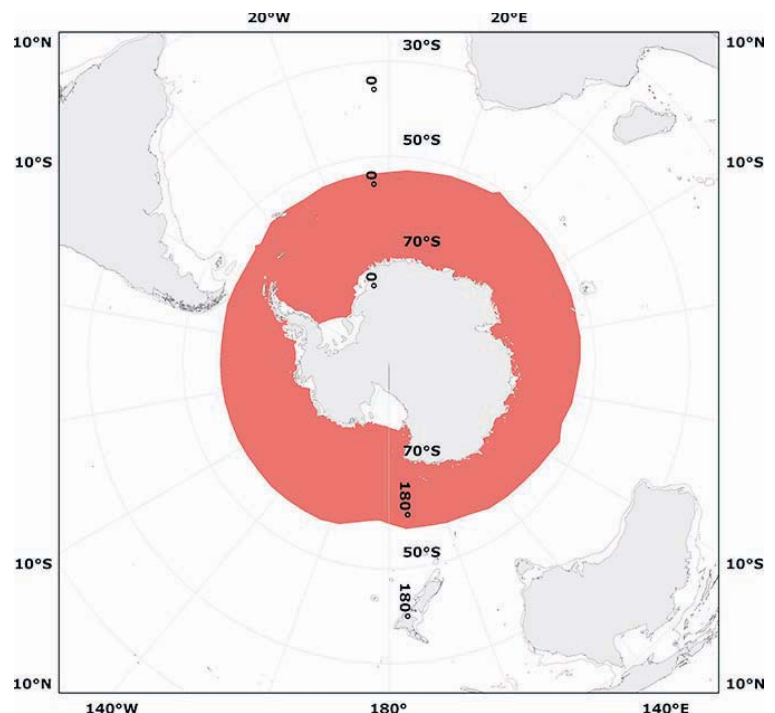
**Diagnostic Features:** **Tentacular clubs short (33% of mantle length)** with proximal manus <33% of mantle length, manal and stalk locking apparatus, circular proximal manal suckers with toothed inner rings, **greatly enlarged manus suckers in medial series**, enlarged tooth/hook on proximal arm suckers, **fins short** (35 to 40% of mantle length).

**Size:** The maximum mantle length extends to 270 mm.

**Geographical Distribution:** This species is circumglobal in Antarctic oceanic waters south of 50°S (Antarctic Convergence) (Fig. 272).

**Habitat and Biology:** Paralarvae and juveniles are mesopelagic; adults are mesopelagic to bathypelagic at 750 to 2 800 m. Adults concentrate at 800 to 900 m during the day, spread out vertically at night; ontogenetic descent occurs with juveniles and subadults. Prey of southern elephant seals. In turn, adult *A. antarcticus* prey upon myctophid fishes and krill (*Euphausia superba*).

**Literature:** Filippova and Yukhov (1982), Rodhouse (1988), Lu and Williams (1994a), Rodhouse and Piatkowski (1995), Young *et al.* (1999a), Filippova (2002a,b).

Fig. 271 *Alluroteuthis antarcticus*Fig. 272 *Alluroteuthis antarcticus*

Known distribution

***Narrowteuthis* Young and Vecchione, 2005**

*Narrowteuthis* Young and Vecchione, 2005a, *Proceedings of the Biological Society of Washington*, 118(3): 566–569 [566].

**Type Species:** *Narrowteuthis nesis* Young and Vecchione, 2005.

**Frequent Synonym:** None.

***Narrowteuthis nesis* Young and Vecchione, 2005****Fig. 273**

*Narrowteuthis nesis* Young and Vecchione, 2005a, *Proceedings of the Biological Society of Washington*, 118(3): 566–569. [566]. [Type locality: 27°18'N, 19°44'W, off Canary Islands, eastern North Atlantic Ocean].

**Frequent Synonym:** None.

**FAO Names:** **En** – Nesis' narrow squid; **Fr** – Loutène nouveau de Nesis; **Sp** – Neoluria de Nesis.

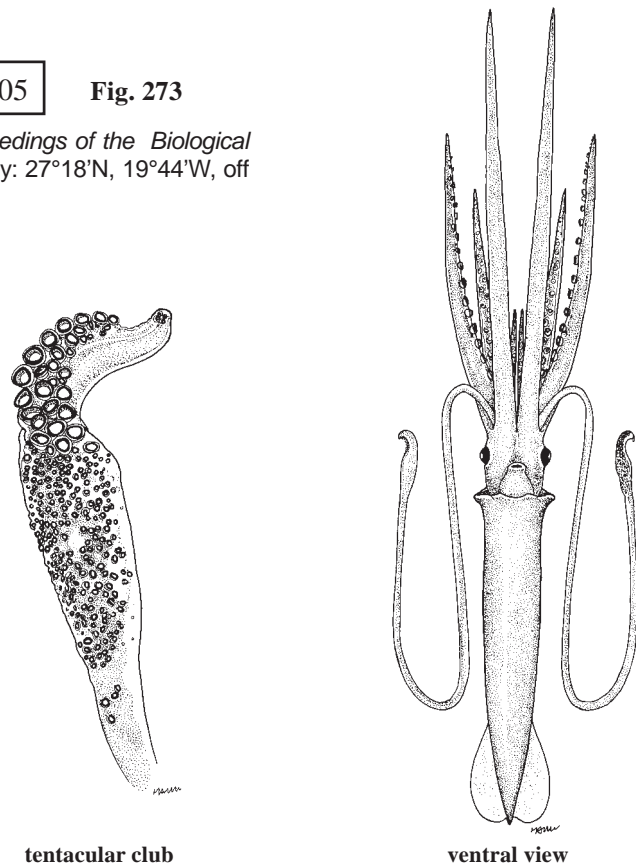
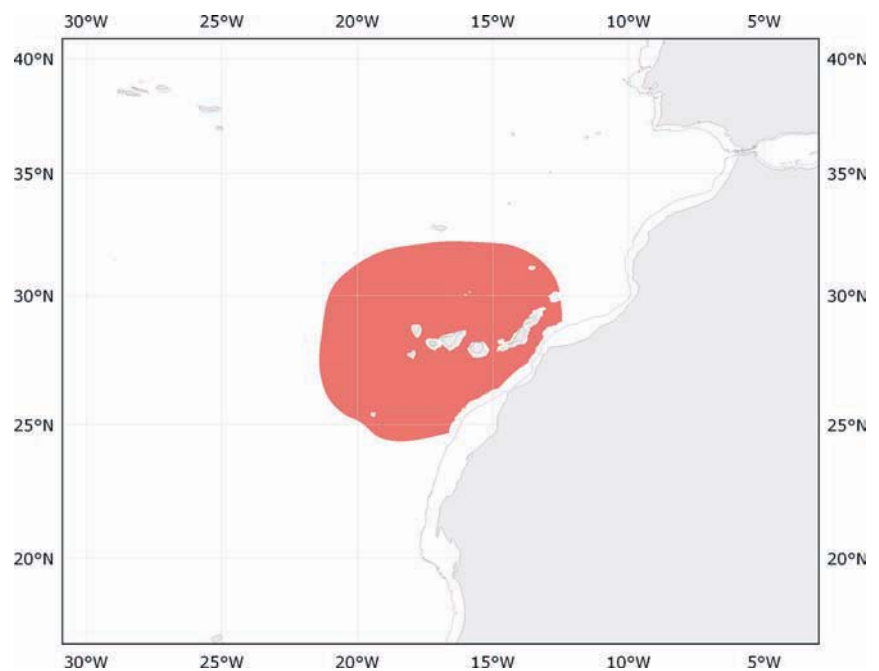
**Size:** Mantle length 100 mm.

**Geographical Distribution:** Eastern North Atlantic Ocean, off Canary Islands (Fig. 274).

**Habitat and Biology:** Specimens are bathypelagic at 1 750 to 2 000 m.

**Remarks:** Only 2 specimens of this species are known.

**Literature:** Young and Vecchione (2005a,b).

**Fig. 273 *Narrowteuthis nesis*****Fig. 274 *Narrowteuthis nesis***

■ Known distribution



***Nototeuthis* Nesis and Nikitina, 1986**

*Nototeuthis* Nesis and Nikitina, 1986b, *Zoologicheskij Zhurnal*, 65(2): 290–294. [290].

**Type Species:** *Nototeuthis dimegacotyle* Nesis and Nikitina, 1986.

**Frequent Synonyms:** None.

***Nototeuthis dimegacotyle* Nesis and Nikitina, 1986****Fig. 275**

*Nototeuthis dimegacotyle* Nesis and Nikitina, 1986b, *Zoologicheskij Zhurnal*, 65(2): 290–294 [290]. [Type locality: 50°38.5'S, 081°40.5'W, off southern Chile, eastern south Pacific Ocean].

**Frequent Synonyms:** None.

**FAO Names:** **En** – Large sucker neosquid; **Fr** – Loutène nouveau grand-ventose; **Sp** – Neoluria ventosa-grande.

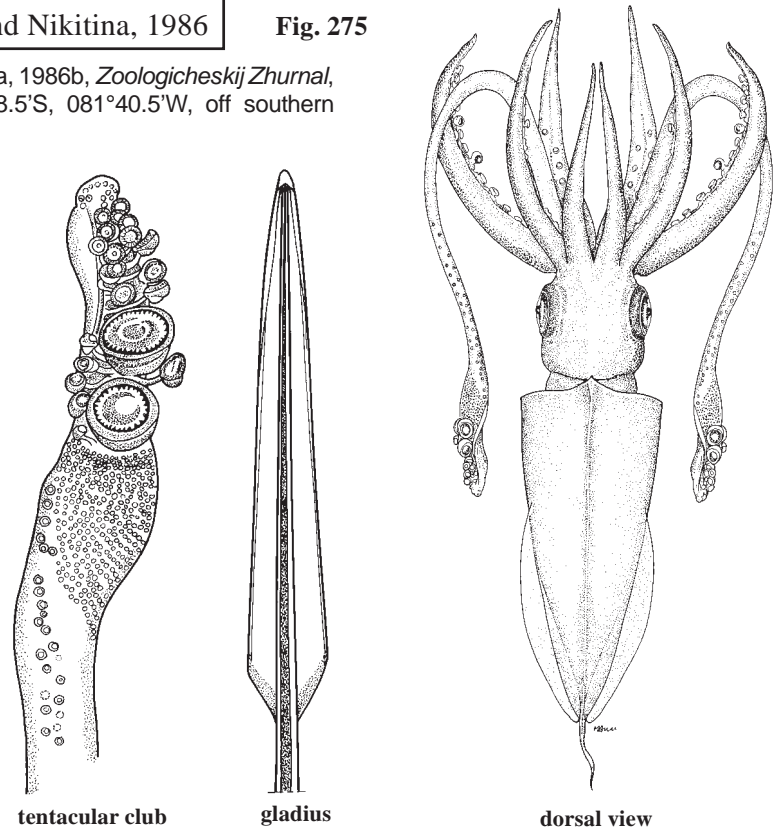
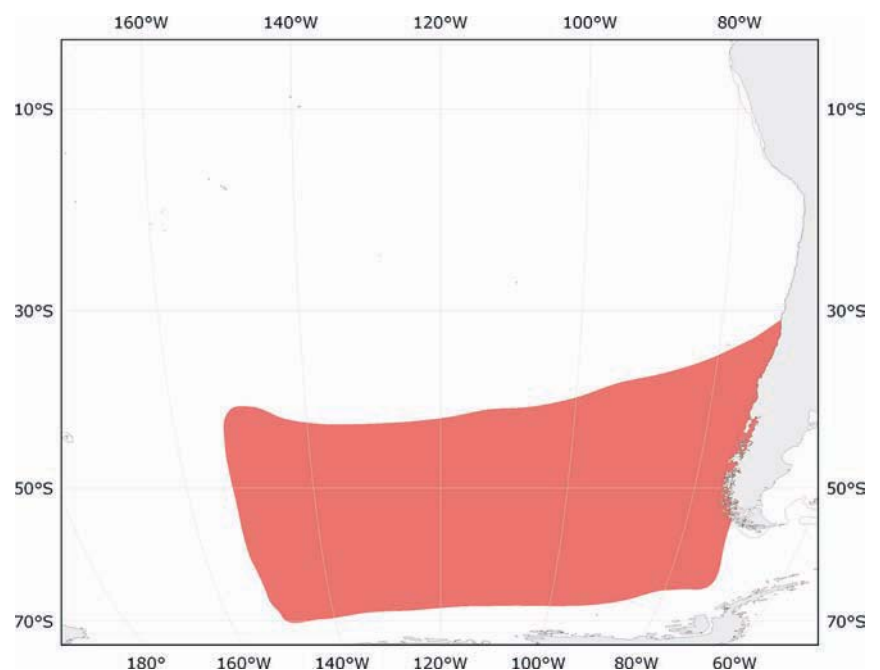
**Diagnostic Features:** **Clubs short** (<40% of mantle length), **fins long** (60% of mantle length); **2 greatly enlarged suckers on distal-manus**.

**Size:** The mantle length grows to 83 mm.

**Geographical Distribution:** Eastern and southern South Pacific Ocean between the Southern Subtropical and the Antarctic Polar frontal zones (Fig. 276).

**Habitat and Biology:** This species is mesopelagic to bathypelagic, it occurs from the surface down to 500 m depth.

**Literature:** Nesis and Nikitina (1986b, 1992), Vecchione and Young (2003b), Okutani (2005).

**Fig. 275** *Nototeuthis dimegacotyle***Fig. 276** *Nototeuthis dimegacotyle*

■ Known distribution

**2.21 Family OCTOPOTEUTHIDAE Berry, 1912**

by Clyde F.E. Roper and Patrizia Jereb

Octopoteuthidae Berry, 1912, *Proceedings of the Academy of Natural Sciences of Philadelphia*, 64(2): 380–444 [432].**Type Genus:** *Octopoteuthis* Rüppell, 1844:[134].**FAO Names:** **En** – Octopus squids; **Fr** – Encornets poulpes; **Sp** – Pulpotas.

**Diagnostic Features:** Body mainly soft, semi-gelatinous. Mantle broad, elongate, subconical, weakly muscled; tapers posteriorly to bluntly to moderately acuminate tip (tail). **Fins very long, broad, transversely oval, muscular; fused together along dorsal midline of mantle; fin length approaches mantle length in adults;** a small U-shaped area occurs on anterior edge of fins, and demarcates the small anterior fin lobes. Head broad, with large prominent eyes. **Arms with biserial hooks enveloped in soft integumentary sheaths;** small to minute suckers in 2 series occur only near the arm tips. **Tentacles** occur only in paralarvae and very early juveniles; **absent in adults;** clubs short, spatulate with about 8 proportionally large suckers in 2 series; a few suckers may be “greatly” enlarged. Buccal membrane with 6 supports and lappets; buccal connectives attach to ventral borders of arms IV. Funnel-locking cartilage a simple, straight, elongate groove, slightly widened posteriorly. Gladius very thin; a wide vane originates at anterior end, extends posteriorly to small terminal conus. **Photophores present on tips of some or all arms;** photophores may be embedded in the tissue of head and/or mantle and/or arms. **Hectocotylus absent; penis often greatly enlarged, elongate; may extend well beyond the mantle opening.**

**Size:** Medium- to large-sized squids, up to 1.5 m mantle length.**Geographic Distribution:** Globally distributed in tropical and subtropical waters.

**Habitat and Biology:** Species of this family inhabit mesopelagic to bathypelagic and benthic-bathyal zones of tropical and temperate waters, but they also venture into boreal waters. They frequently are preyed upon by odontocete cetaceans, particularly sperm whales.

**Interest to Fisheries:** As a relatively soft-bodied, semi-gelatinous form, its generally mesopelagic habitat and its rarity in collections, this family would seem to have little current potential for a sustainable fishery.

**Local Names:** USA: Eight-arm squids.

**Remarks:** The family consists of 2 genera, *Octopoteuthis* and *Taningia*. *Octopoteuthis* includes 7 species, mostly poorly known, while *Taningia* is currently recognized as monotypic. While the arm tips of *Octopoteuthis* species possess delicate elongate photophores, they frequently are missing in specimens, because the arm tips seem especially fragile and break off during capture. *Taningia* has a very large, bulbous photophore on the tips of arms II. Considerable confusion has existed over the correct familial name for this group and for the type genus. Rüppell’s (1844) original (and intended) designation was *Octopoteuthis*, clearly in reference to the absence of tentacles in adults (the paralarvae and juveniles were unknown at the time of the original description). Krohn (1845) introduced *Octopodoteuthis* as a replacement name, but that was without explanation or justification; subsequently this name has been officially designated an “unjustified emendation”. Then Krohn (1847) changed the name to *Verania* because the tentacles were discovered on the paralarvae; this name, too, is untenable. Likewise the designations of the family as Octopodoteuthidae or Veranyidae are untenable, being based on junior synonyms of *Octopoteuthis* (see discussions in Berry, 1912; Adam 1952; Roper *et al.*, 1969b; Roper and Vecchione, 1993).

**Literature:** Young (1972a), Nesis (1982, 1987), Stephen (1985a, b), Stephen and Jefferts (1992), Roper and Vecchione (1993), Young and Vecchione (1996b), Sweeney and Young (2003t).

**Key to the genera of Octopoteuthidae (adults)**

- 1a.** A small, narrow, spindle-shaped photophore on the tips of all arms; photophores embedded in tissue of mantle, head and arms (varies among species); tentacles present in paralarvae; always weak, gelatinous; lost at about 12 mm mantle length; mantle lengths to 500 mm, usually not in excess of 200 mm . . . . . ***Octopoteuthis***
- 1b.** A large oval, swollen composite photophore on tip of each arm II; it consists of a creamy white crenulate, luminous-producing surface, exposed when eyelid-like skin flaps are retracted; no photophores on any other arms; no (known) photophores embedded in tissues of mantle, head or arms; tentacles conspicuous in paralarvae with robust stalks up to about 40 mm mantle length, after which they diminish and disappear; mantle length up to 1.5 m . . . . . ***Taningia***

**Key to the genera of Octopoteuthidae (paralarvae, juveniles)<sup>1/</sup>**

- 1a.** Tentacles with weak, gelatinous stalks that are lost at sizes greater than 12 mm mantle length; when still present, tentacles longer than arms with up to about 8 proportionally large suckers; tentacle bases may be present up to about 25 mm mantle length; arms usually proportionally longer; some arm suckers develop into hooks by 2.5 mm mantle length in some species; paired photophores may develop on ink sac by 15 mm mantle length . . . . . ***Octopoteuthis***
- 1b.** Tentacles with robust stalks, clubs with 8 small suckers; tentacles much shorter than arms II (except longer at 2 mm mantle length in Hawaiian species), occur up to about 38 mm mantle length before being lost; arms proportionally short, robust; no hooks develop before 5 mm mantle length; large, single, median photophore on ink sac by 5 mm mantle length . . . . . ***Taningia***

***Octopoteuthis* Rüppell, 1844**

*Octopoteuthis* Rüppell, 1844, *Giornale del Gabinetto Letterario di Messina*, 5(27–28): 129–135 [134].

**Type Species:** *Octopoteuthis sicula* Rüppell, 1844.

**Frequent Synonyms:** *Octopodoteuthis* Krohn, 1845; *Verania* Krohn, 1847; *Octopodoteuthopsis* Pfeffer, 1912.

**Diagnostic Features:** Tips of all 8 arms with a terminal, small, black-pigmented, spindle-shaped photophore without lateral folds of skin (“eyelid” structure). Small photophores deeply embedded in tissues of mantle, head and arms (number and size vary among species). Fin width in juveniles does not exceed (or just barely) mantle length. Tentacles entirely reduced by end of paralarval stage, at about 10 to 15 mm mantle length.

**Size:** The mantle length can attain a maximum of 500 mm, but normally it reaches 200 mm.

**Remarks:** The systematics of *Octopoteuthis* species composition still are quite unsettled because 1) several holotypes are no longer extant or are too damaged to yield pertinent data; 2) only 1 or a very few specimens are available for some nominal species; 3) subsequently discovered characters (e.g. embedded photophores) are undescribed/unknown for some entities. At present the genus has 7 named but poorly defined species (Young and Vecchione, 2008f): *Octopoteuthis danae*, *O. deletron*, *O. indica*, *O. nielsenii*, *O. megaptera*, *O. rugosa*, *O. sicula*. Young (1972a) and Clarke (1980) consider *O. indica* Naef, 1923 and *O. nielsenii* Robson, 1948 to be insufficiently characterized for specific identification/delineation. Sweeney and Young (2003t) list them as valid species from a nomenclatural point of view. *Octopoteuthis persica* Naef, 1923, was transferred to *Taningia* by Young (1972a) and *O. longiptera* Akimushkin, 1963, now is accepted as a *species dubium* (Young, 1972a, Clarke, 1980, Sweeney and Young, 2003t).

**Literature:** Young (1972a), Sweeney and Young (2003t), Young and Vecchione (2008f).

<sup>1/</sup> from Steven and Jefferts (1992).

***Octopoteuthis sicula* Rüppell, 1844****Fig. 277**

*Octopoteuthis sicula* Rüppell, 1844, *Giornale del Gabinetto Letterario di Messina*, 5(27–28): 129–135 [135]. [Type locality: western Mediterranean Sea].

**Frequent Synonyms:** None.

**FAO Names:** **En** – Rüppell's octopus squid; **Fr** – Encornet-poupe de Rüppell; **Sp** – Pulpito volador.

**Diagnostic Features:** **Mantle conical, short; acuminate posteriorly;** musculature flabby with gelatinous integumentary layer and rugosities. **Fins large, length around 90% of the mantle length, width 115% of mantle length;** extend to posterior tip of mantle. **A pair of photophores embedded in posterior mantle,** about 20 to 25% of mantle length from posterior tip. Head gelatinous; **3 pairs of embedded photophores on lateral sides of funnel groove and near neck;** photophores embedded at bases of arms III and IV. Tail short, indistinct in juveniles.

**Size:** The mantle length grows to 200 mm (possibly to 500 mm).

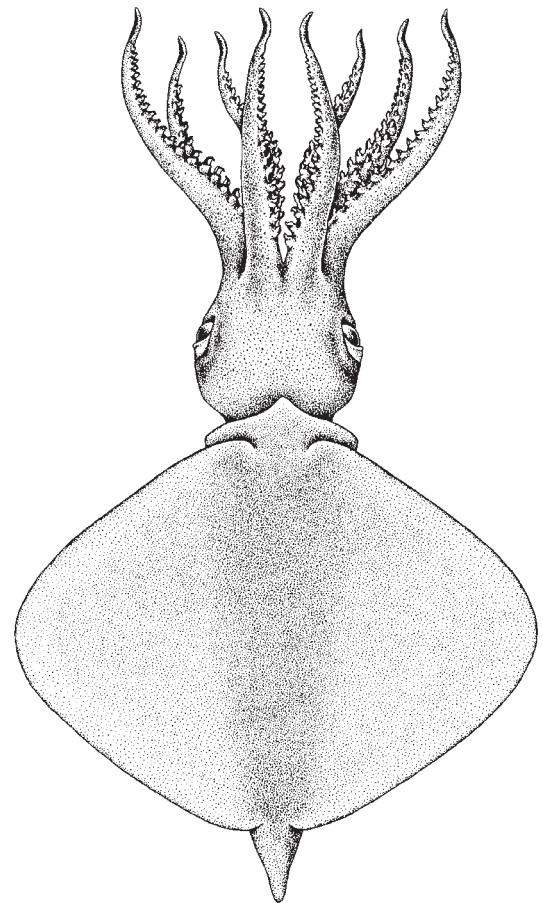
**Geographical Distribution:** This species occurs in tropical, subtropical, subtemperate waters in the Atlantic Ocean to South Africa and in the Indo-West Pacific Ocean; Mediterranean Sea; possibly tropical eastern Pacific Ocean from Mexico to Chile, westward to Hawaii (Fig. 278).

**Habitat and Biology:** Its vertical distribution is mesopelagic to bathypelagic (to 2 000 m) during daytime with nocturnal ascent into epipelagic zone. In the eastern North Atlantic Ocean juveniles are caught from May to September as planktonic vertical migrators. Predators include numerous oceanic fish species, such as tunas, swordfish, dolphin fish, lancetfish, albatrosses, dolphins, toothed whales, including sperm whales and Cuvier's beaked whales, and *Sthenoteuthis* squid.

**Interest to Fisheries:** Because of the semi-gelatinous consistency of the flesh, it seems unlikely that this species will be fished for human consumption until processing techniques develop; it does, however, grow to a suitable size.

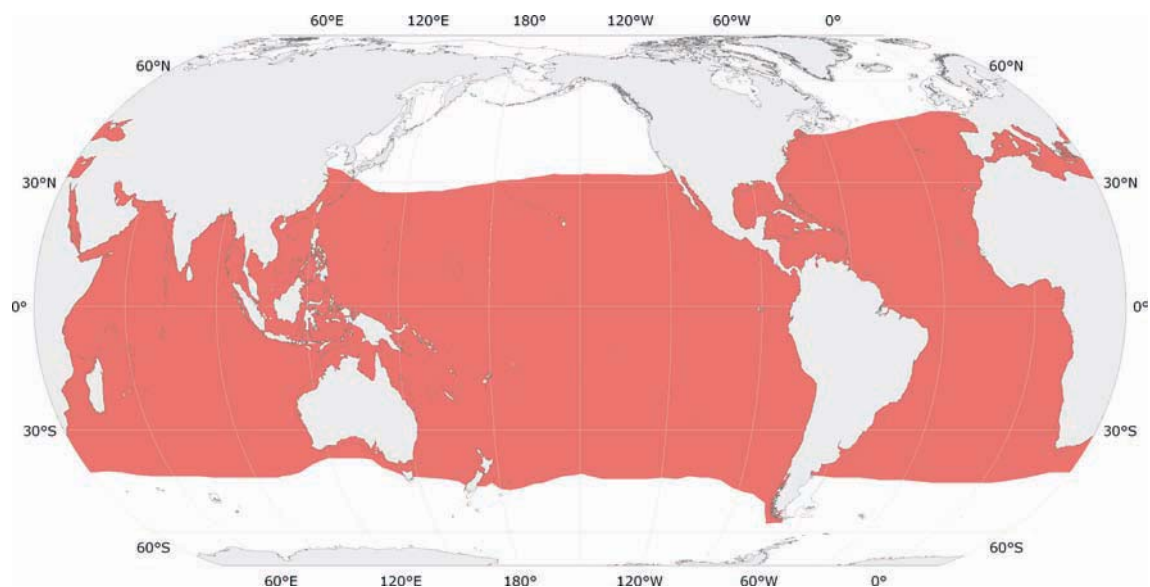
**Local Names:** ITALY: Totano-polpo; RUSSIA: Vosmiruki kalmar.

**Literature:** (See list under family); Nesis (1982, 1987), Stephen (1985a,b), Guerra (1992), Dunning and Lu (1998), Hoving *et al.* (2006b, 2008).



dorsal view

**Fig. 277** *Octopoteuthis sicula*



**Fig. 278** *Octopoteuthis sicula*

Known distribution

**Taningia** Joubin, 1931

*Taningia* Joubin, 1931, *Annales de l'Institut Océanographique, Monaco*, 10(7): 169–211 [181].

**Type Species:** *Taningia danae* Joubin, 1931.

**Frequent Synonyms:** *Cuciotheuthis* Steenstrup, 1882a.

**Diagnostic Features:** Mantle broad, robust, muscular, entirely pigmented an intense maroon. **Tips of arms II only with a large, oval, swollen, composite photophore with a creamy white, crenulate bioluminescent-producing surface, exposed when black eyelid-like skin folds are contracted open (no photophores on tips of any other arms);** photophores begin to develop at about 4.5 to 5 mm mantle length; no photophores (known to) exist embedded in the tissues of the mantle, head or arms; 1 photophore is embedded on each side of the intestine ventral to the ink sac. **Fins very large, occupy nearly entire mantle length** by about 3 mm mantle length of the paralarva and throughout life; fins **very broad, far in excess of mantle length** (up to 130% of mantle length). Tentacles robust on paralarvae, with some of the 8 suckers considerably enlarged; **tentacles** cease to develop and are **lost at a mantle length of 40 to 45 mm** (although stumps may remain for some time). **Arms with large hooks in 2 series to the tips**, where minute suckers may occur as incipient hooks; hooks begin to develop at about 5 mm mantle length. *Taningia* currently is recognized as monotypic. Lower beak broad; jaw edge visible from side is slightly longer than wing length in small specimens or slightly shorter in larger specimens; hood broad, with a distinct medial notch; wing fold poorly developed, covered with cartilage and hardly concealing jaw angle in profile; the shoulder is mainly cartilage but near jaw angle the chitin forms a shoulder ridge; crest slightly thickened; a distinct thickened fold runs to a position about halfway between the crest and the corner of the lateral wall.

**Size:** These squids attain mantle lengths in excess of 1.5 m.

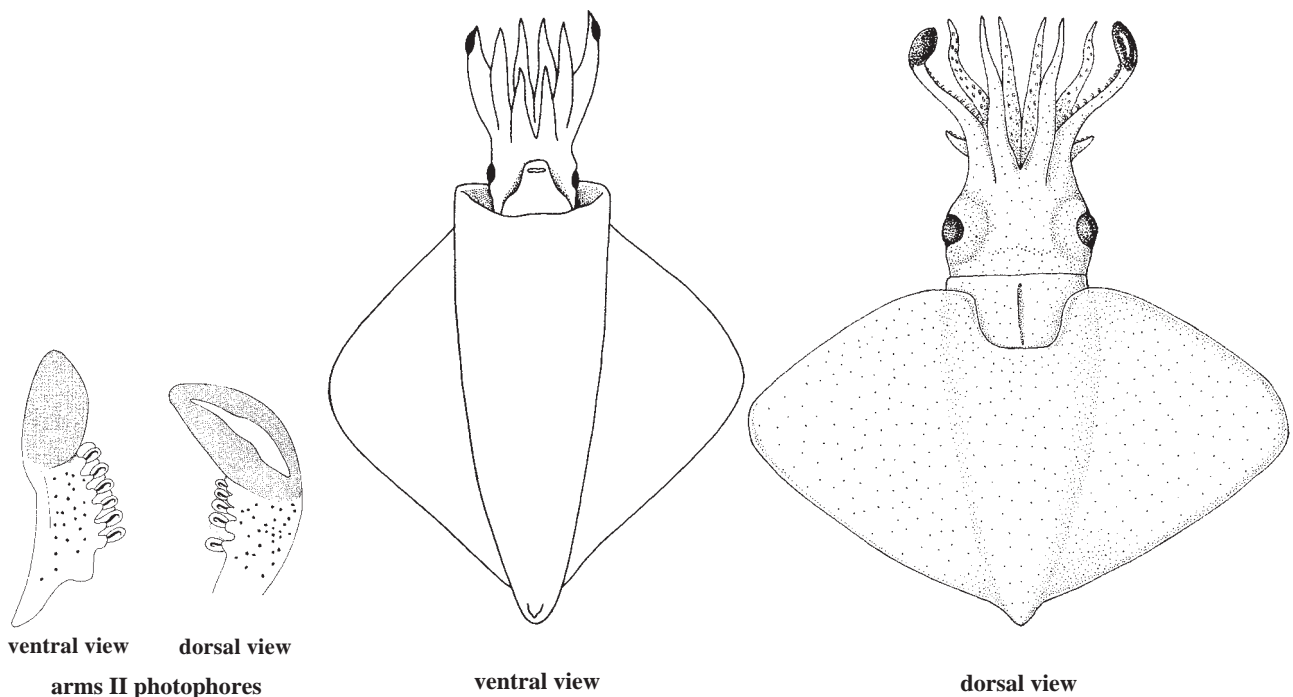
**Remarks:** *Taningia* currently is recognized as monotypic.

**Taningia danae** Joubin, 1931**Fig. 279; Plate VIII, 47–48**

*Taningia danae* Joubin, 1931, *Annales de l'Institut Océanographique, Monaco*, 10(7): 169–211 [181]. [Type locality: 14°52'N, 28°04'W, central Atlantic Ocean].

**Frequent Synonyms:** *Sepia unguiculata* Molina, 1782; *Cuciotheuthis unguiculatus* Joubin, 1898b, 1900; *C. unguiculatus*, Clarke, 1966; *C. unguiculata*, Rees and Maul, 1956; *C. unguiculata*, Clarke, 1962.

**FAO Names:** **En** – Taning's octopus squid; **Fr** – Encornet-poulpe de Taning; **Sp** – Pulpota de Taning.

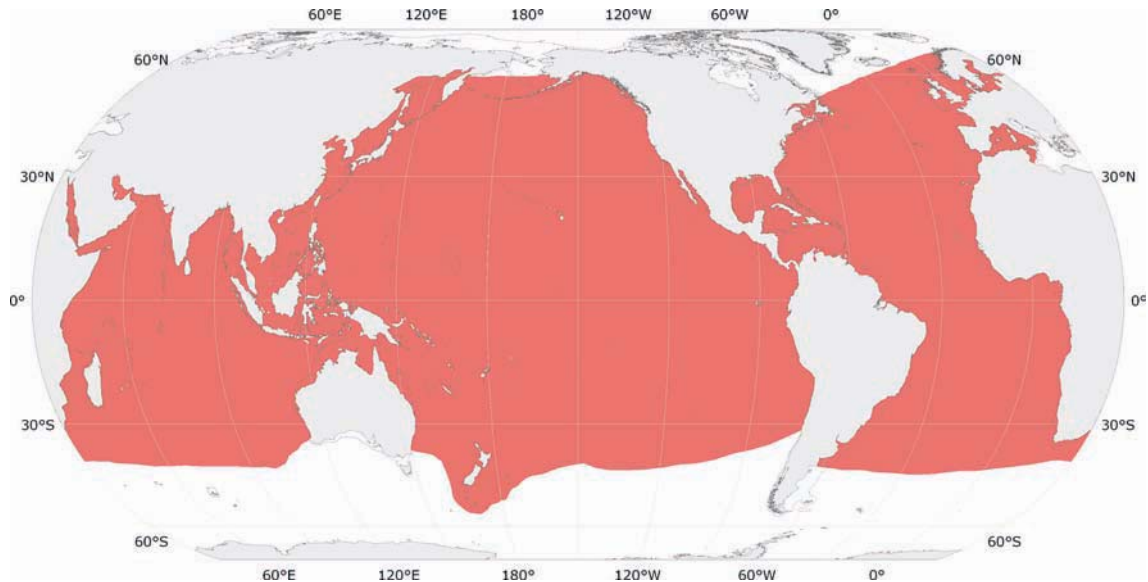


**Fig. 279** *Taningia danae*

**Diagnostic Features:** The characters are those of the monotypic genus.

**Size:** The maximum mantle length recorded is 170 cm; maximum weight 161 kg (see Remarks section for details).

**Geographical Distribution:** *Taningia danae* is circumglobal in tropical and subtropical waters; it occurs from 50°N to 40°S to 45°S throughout the Atlantic Ocean, throughout the Pacific Ocean, including Hawaiian, Japanese and New Zealand waters, and across the Indian Ocean. It was captured for the first time 2006 in the Mediterranean Sea during a trawl survey of the Algerian coast at 385 to 395 m (Fig. 280).



**Fig. 280** *Taningia danae*

■ Known distribution

**Habitat and Biology:** *Taningia danae* is an oceanic species; paralarvae and juveniles are epipelagic to upper mesopelagic, then undergo ontogenetic descent into the lower mesopelagic, bathypelagic and bathyal zones. Adults undergo diel vertical migration and ascend into the epipelagic zone at night. Juveniles have been captured at night within 175 m of the surface, while the remains of a large specimen (50 kg) were taken from the stomach of the bottom-living shark, *Centroscymnus coelolepis*, caught on a bottom-set longline at 1 246 m. A mature female of 1.4 m mantle length had 250 000 ovarian eggs. Observations on bioluminescence from living animals verified a rapid flash response from the arm tip photophores, as a startling or warning function, and a steady glow from the visceral photophores as is common for protective counter illumination. *In situ* video footage reveals that *T. danae* is a strong swimmer; both forward and backward, propelled by its huge fins, and it changes directions quickly by bending its body. It attained speeds of 7.2 to 9 km/h when it attacked the bait rig. It emitted short, bright flashes from its 2 arm-tip photophores before it attacked. It also emits long and short glows intermittent glows when swimming around the lighted bait rig. *Taningia danae* is preyed upon by many species of pelagic fishes, including lancetfish (*Aleposaurus ferox*), tunas, swordfish (*Xiphias gladius*), hammerhead, tiger and blue sharks, as well as odontocete cetaceans: short-finned pilot whale and most especially, sperm whales in all oceans.

**Interest to Fisheries:** *Taningia danae* grows to a very large size, up to 170 cm mantle length and 161.4 kg, with thick mantle and fin musculature. It is thought that a good potential exists for the development of a significant fishery for this species.

**Remarks:** The maximum reported mantle length for the species is 170 cm (Nesis, 1982, 1987). The maximum reported weight is 161.4 kg, for the specimen of 160 cm mantle length recorded in the North Atlantic Ocean (Roper and Vecchione, 1993); in that paper, however, a typographical error occurred and a weight of 64.4 kg was reported. This species was captured for the first time in the Mediterranean Sea in 2006, during a trawl survey off the Algerian coast, at 385 to 395 m (Quetglas *et al.*, 2006).

**Local Names:** None available.

**Literature:** Okutani (1974a), Roper and Young (1975), Herring *et al.* (1992a), Roper and Vecchione (1993), Nesis (1999a), Gonzalez *et al.* (2003), Quetglas *et al.* (2006), Kubodera *et al.* (2007a).

**SPECIES OF NO CURRENT INTEREST TO FISHERIES, OR RARE SPECIES  
FOR WHICH ONLY FEW RECORDS EXIST TO DATE**

***Octopoteuthis danae* Joubin, 1931**

*Octopoteuthis danae* Joubin, 1931, *Annales de l'Institut Océanographique, Monaco*, 10(7): 169–211 [185]. [Type locality: 35°15'N, 68°20'W, northwest of Bermuda Islands, western North Atlantic Ocean].

**Frequent Synonyms:** *Octopoteuthis danae* Joubin, 1931.

**Size:** Mantle length small, undetermined.

**Geographical Distribution:** Subtropical North Atlantic Ocean, Sargasso Sea, Senegal. One specimen captured in closing net at 100 to 50 m at night in eastern North Atlantic Ocean.

**Literature:** Lu and Clarke (1975b), Herring *et al.* (1992a), Okutani (2005).

***Octopoteuthis deletron* Young, 1972**

*Octopoteuthis deletron* Young, 1972, *Smithsonian Contributions to Zoology*, 97: 1–159 [40]. [Type locality: 33°15'N, 118°37'W, off southern California, eastern North Pacific Ocean].

**Size:** Mantle length attains a total of 170 mm.

**Geographical Distribution:** Range extends approximately from off Washington to off Baha California; 1 record off northern Peru (07°45'S) represents a possible disjunct distribution.

**Habitat and Biology:** Vertical distribution is 200 to 700 m during day time, mostly 200 to 400 m; at night population ascends and disperses to 0 to 500 m.

**Literature:** Young (1972a), Nesis (1982, 1987), Young (1999c), Young and Vecchione (2006b).

***Octopoteuthis indica* (Naef, 1923)**

*Octopoteuthis indica* Naef, 1923, *Fauna e Flora de Golfo di Napoli, Monograph 35*, 1(1)(part 2): 149–863 [336]. [Type locality: Agulhas current, off South Africa, eastern South Atlantic Ocean].

**Frequent Synonyms:** *Octopoteuthis indica* Naef, 1923.

**Size:** Undetermined.

**Geographical Distribution:** Eastern South Atlantic Ocean, off South Africa.

**Literature:** Roeleveld (1998).

***Octopoteuthis megaptera* (Verrill, 1885)**

*Ancistrocheirus megaptera* Verrill, 1885, *Transactions of the Connecticut Academy of Sciences*, 6(2): 395–452 [399]. [Type locality: 39°12'N, 72°03'W, off New Jersey, western North Atlantic Ocean].

**Size:** The mantle attains a length to 200 mm.

**Geographical Distribution:** Subtropical to tropical cosmopolitan, western, central and eastern Atlantic Ocean, western tropical Pacific Ocean to 36°S off east coast Australia and to Cape Leeuwin off west coast Australia, Indian Ocean.

**Habitat and Biology:** Vertical distribution of this species is mesopelagic, bathypelagic and bathyal with vertical ascent into epipelagic zone at night. One specimen was captured in closing net at night at 230 m.

**Literature:** Roper and Young (1975), Nesis (1982, 1987), Nesis (1999b), Vecchione *et al.* (2002), Okutani (2005).

***Octopoteuthis nielsenii* (Robson, 1948)**

*Octopoteuthis nielsenii* Robson, 1948, *Zoologica*, 33(3): 115–132 [120]. [Type locality: off Cocos Island, Galapagos Islands, eastern tropical Pacific Ocean].

**Size:** The mantle length attains 200 mm.

**Geographical Distribution:** The species occurs from Mexico to northern Chile and westward to Hawaiian Islands region.

**Habitat and Biology:** This is a mesopelagic to bathypelagic species that ascends into the epipelagic zone at night.

**Literature:** Nesis (1982, 1987), Dunning *et al.* (1993), Norman (2000).

***Octopoteuthis rugosa* Clarke, 1980**

*Octopoteuthis rugosa* Clarke, 1980, *Discovery Reports*, 37: 1–324 [156]. [Type locality: off southeastern South Africa, western South Indian Ocean].

**Size:** The mantle length reaches 230 mm.

**Geographical Distribution:** It occurs in the tropical and subtropical Atlantic Ocean and the Indo-West Pacific Ocean, e.g. Mauritania, and the equatorial Atlantic Ocean, southern Africa, southwestern Australia, Sulu and Flores Seas (south Georgia unconfirmed).

**Habitat and Biology:** This is a mesopelagic species.

**Literature** Clarke (1980), Nesis (1982, 1987), Roper *et al.* (1995), Okutani (2005).