

CEPHALOPOD ID GUIDE FOR THE MEDITERRANEAN SEA



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PREFACE

The intention of this guide is to help identifying cephalopod species in the Mediterranean Sea which you may find while SCUBA diving, snorkelling, a boat trip or even while walking along a rocky shore. It focuses on shallow water and subsurface-inhabiting species or those which at least partially spent their life in depths less than 50 meters. As you may encounter these animals in the wild most likely just for a short glance, we kept the description of each cephalopod rather simple and based on easy-to-spot external features.

This guide was made within the scope of the project “Cephalopod Citizen Science”. This project tries to gather scientific information about the “daily life” of cephalopods by analysing pictures of those animals which were posted in several, project-related facebook groups. For further information about this project, please follow the link below:

<https://www.researchgate.net/project/Cephalopod-Citizen-Science>

We hope this guide will provide useful information and help you to identify those cephalopods you may encounter soon.

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Common octopus (*Octopus vulgaris*). © dkfindout.com

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How should we interact with cephalopods when diving with them?

by Dr Gavan Cooke

I have published scientific research showing that cephalopods will reveal adeptly how they feel about a particular circumstance (e.g. Tonkins et al., 2015, Cooke and Tonkins 2015). This brief collection of thoughts is based on cephalopods needing to be treated a bit differently from other marine animals based on some key differences. Compelling and abundant evidence suggests that these animals can suffer and feel pain. As a result, they are protected around the world, as vertebrates are (e.g. EU Directive 2010/63/EU; ASPA 1986). Unlike marine mammals, marine fish, sharks and crustaceans, cephalopods damage very easily. They become exhausted when pursued by divers, who are used to interacting with animals that have evolved for fast and or long periods of swimming.

Tips on increasing stress-free interactions are very welcome. Please use the group page to make suggestions (<https://www.facebook.com/groups/1772714999700580/>)

- Cephalopods are very fragile and damage easily if they hit objects – they do not easily repair their skin like fish and do not have hard shells like crustaceans
- Most cephalopods are very poor swimmers, and chasing them exhausts them easily, this could lead to being eaten by predators more easily
- There is good evidence they can feel fear and can feel pain
- Let them choose the level of interaction with you
- If they feel like being curious then fine, but if they do not then leave them alone
- Do not chase after them – if you do they may jet into something and damage themselves or become exhausted
- Look out for their warning signals (below). If you see them just move back a little bit and allow the cephalopod to relax in your presence
- They have individual personalities, some may always want to play, some may never want to, allow them to choose. Some days you will be lucky other days you might not
- Although known for their inking behaviour, this is a very last resort, so do not wait for that to happen before considering changing how close you are to them

Signs that a cephalopod is unhappy with your presence



This cuttlefish is warning us that we are getting too close. Often used in hunting, the signal also used in this defensive context. This might be the very first sign you are bothering it. Image by Tamsyn Mann.



Bobtail squids do something similar, whilst moving away. If you see this then it is threatening you and perhaps you should consider holding off. Image by Tamsyn Mann.



This looks to be the squid equivalent of the first warning sign. Image by Luke Peters.



This is another classic cuttlefish warning display, especially if you are above the cuttlefish. It will flatten its body and two dark eye spots will appear on the back of its mantle. You might also see a dark ring around the mantle fin and dark rings around the eyes. If you see this perhaps think about moving back a little bit or from being over the top of it. Image by Gavan Cooke

Signs that a cephalopod is unhappy with your presence



Many cephalopods go white (sometimes called 'ghosting') when they are threatened. It is also seen when they are asleep and at night. Image by Tamsyn Mann.



We know much less about the defensive signals in squid, this might be the equivalent to cuttlefish 'ghosting'. Image by Luke Peters.



Here is an example of the curled octopus changing colour when being disturbed, from red to a much paler, almost white colour. Octopus can go a very bright white and may have really dark eyes. It is possible they are trying to frighten you as they feel threatened. Images by Catherine Hollingdale of North East Dive.

OCTOPUSES (*OCTOPODA*)

Introduction

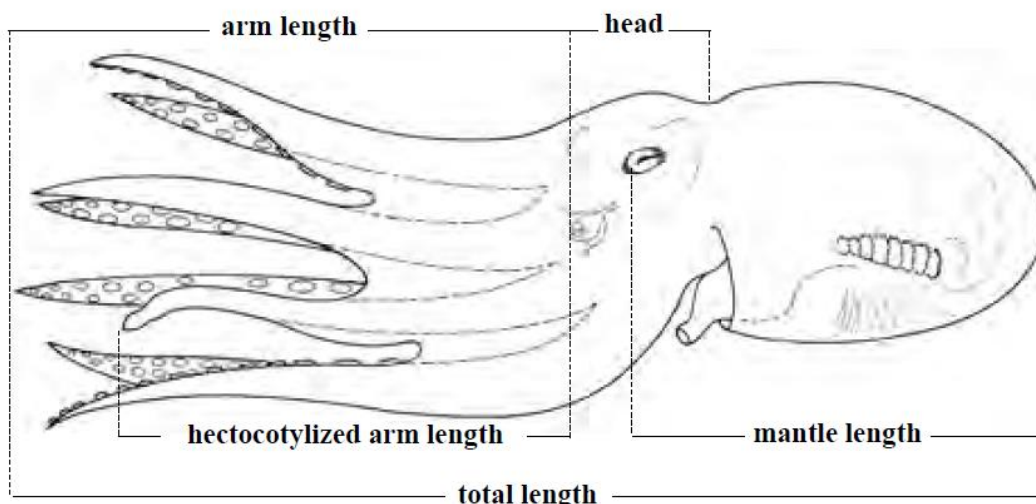
Octopuses include several species occurring in a wide range of habitats, from intertidal zones and coral reefs to the deep sea. While most of them live in the benthic zone, there are a few pelagic species. All octopuses are characterised by their eight arms (not tentacles!) which are usually equipped with sucker cups. Unlike other cephalopods, most octopuses (to be more specific, the suborder *Incirrina* to which all octopus species of this guide are belonging to) lack any kind of outer or inner shell. Hence, they can vary their body size and shape and squeeze themselves into small caves and crevasses to shelter from predators.

Octopuses usually have a very short life span of roughly a year, although some deep-sea species may get as old as 5 years. Most octopuses are semelparous, meaning that they die shortly after reproducing. During mating, male octopuses use a specialised arm, the so-called hectocotylus, to insert their spermatophores (packets of sperm) into the mantle cavity of a female. Afterwards, the female spawns a high number of eggs.

Several defensive mechanisms are known from octopuses. While most species usually blend into the nature by changing their skin colour with special kind of cells, the so-called chromatophores, or eject an ink cloud to confuse their predators, some other species may autotomise their limbs (in a similar fashion like some lizards can autotomise their tails). Moreover, very few species learned how to mimic other dangerous marine animals like such as lionfish or sea snakes by changing their colour and using their flexible bodies correspondingly.

Many octopuses have proper eyesight, although most species are colour-blind. They also have chemoreceptors along their sucker cups, giving them the ability to 'taste' what they are touching. Octopuses commonly move around by crawling on their arms but may also swim (and escape predators) by expelling a jet of water from their mantle.

The size of octopuses is normally characterised by measuring the corresponding mantle length, as shown in the figure below:



FAO (2016)

OCTOPUSES (*OCTOPODA*)

Argonauta argo (Linnaeus, 1758)

Order Octopoda
Family Argonautidae
Genus *Argonauta*

Common name: Greater argonaut (UK); Argonaute papier (France); Argonauta común (Spain); Großes Papierboot (Germany)

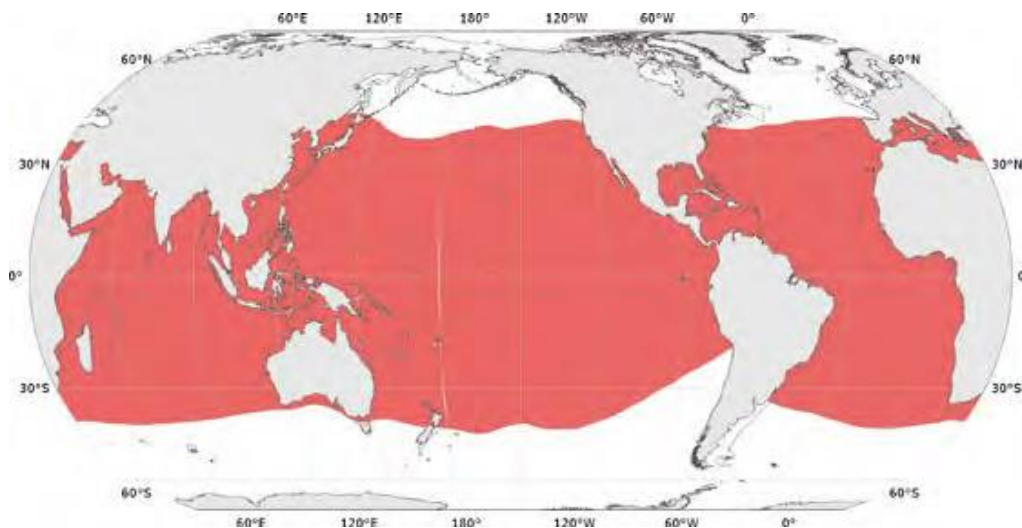
Description: Distinct sexual dimorphism. While the males only reach a total length of 1.5 cm, females grow up to a total length of 44 cm. As all argonauts, females of *A. argo* produce an eggcase which resembles the outer shell of nautilus. However, this eggcase is not a true cephalopod shell but rather an evolutionary invention to secure their eggs. As no *Nautilus* species or other argonauts are present in European waters, this species is easy to identify due to its eggshell.



Jatta (1896)

Distribution: Cosmopolitan species. In European waters, it can be found in the Mediterranean Sea and in Portuguese and Spanish waters.

Habitat: Oceanic, epipelagic species, primarily lives close to the surface. Although very abundant, it is rarely seen by humans. Their eggcases, however, get washed up on beaches every now and then.



FAO 2016

OCTOPUSES (*OCTOPODA*)

Callistoctopus macropus

(Risso, 1826)

Order Octopoda

Family Octopodidae

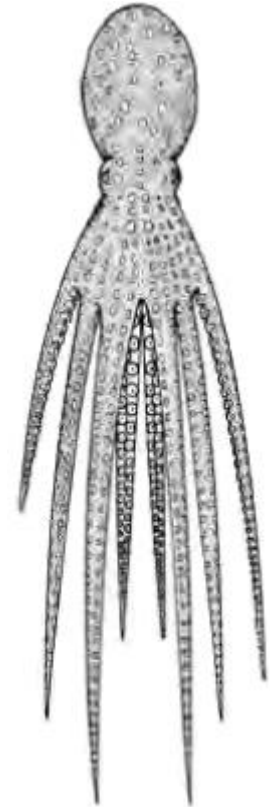
Genus *Callistoctopus*

Common name: White-spotted octopus, grass octopus (UK); Poulpe tacheté (France); Pulpo manchado (Spain); Polpessa (Italy); Weißgefleckter Oktopus (Germany)

Description: Medium-sized, elongate species. Mantle length up to 15.5 cm with arms reaching up to 7 times the mantle length. Common weight around 2 kg. Total body length normally around 80 cm, but exemplars with a total size of 120 to 150 cm were observed. Skin colour brick-reddish with several white spots.

Distribution: Shoreline of the Mediterranean Sea and the eastern Atlantic Ocean, from Morocco to Senegal.

Habitat: This species has a depth range from 0 to 100 meters, but typically occurs around 15 to 20 meters beneath the surface. It prefers sandy and gravel bottoms as well as seagrass meadows and sometimes buries itself under the sand. During the night, *C. macropus* may be found in coral reefs for feeding.



FAO (2016)



FAO (2016; modified)

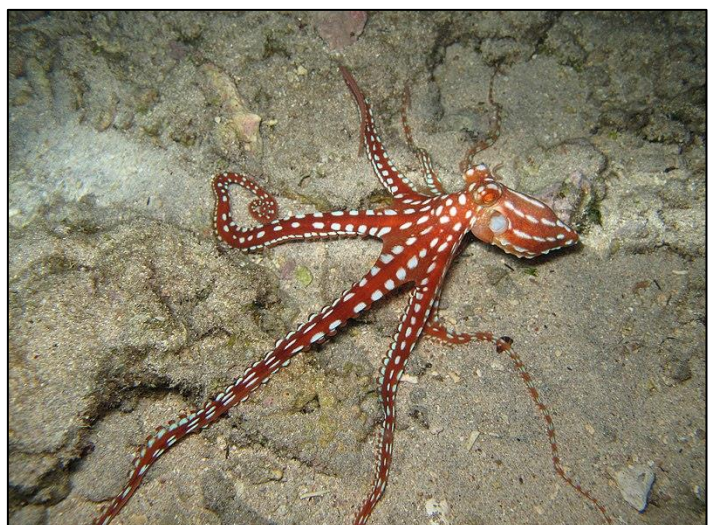


Image by Philippe Bourjon

OCTOPUSES (*OCTOPODA*)

Eledone cirrhosa

(Lamarck, 1798)

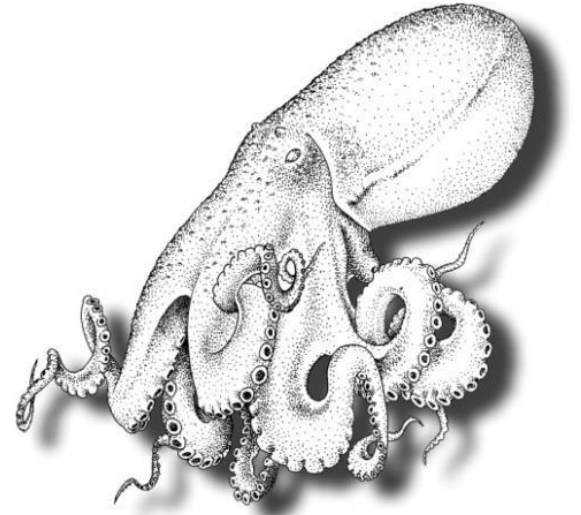
Order Octopoda

Family Eledonidae

Genus *Eledone*

Common name: Horned octopus, curled octopus (UK); Pulpo blanco (Spain); Élédone commune, poulpe, poulpe blanc, pieuvre blanche (France); Moscardino bianco (Italy); Μοσκιός (Greece); Zirrenkrake (Germany)

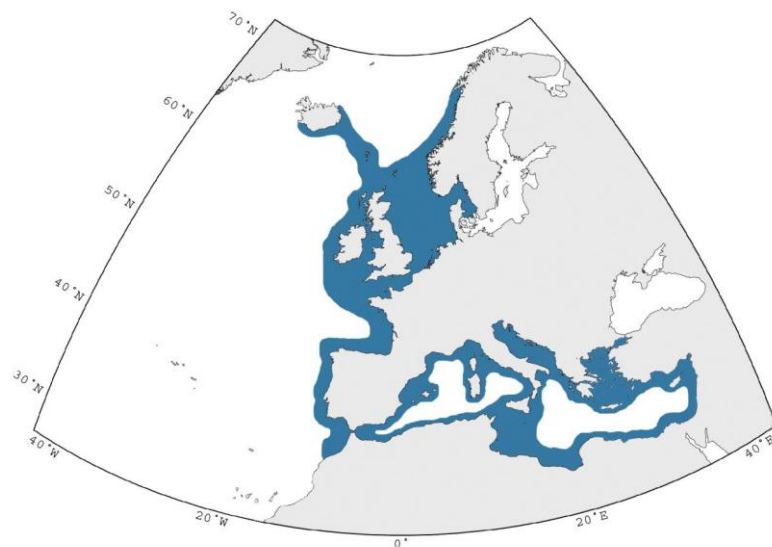
Description: Mantle length up to 19 cm. Total body size up to 55 cm with maximum weight of <1 kg in the Mediterranean Sea and 2 kg in the North-East Atlantic. Arms are moderately short (2,5 to 3 times the mantle length) with one row of suckers. Mating season from spring to autumn with peaks in spring/summer in the western Mediterranean Sea and in summer/autumn in the eastern Mediterranean Sea.



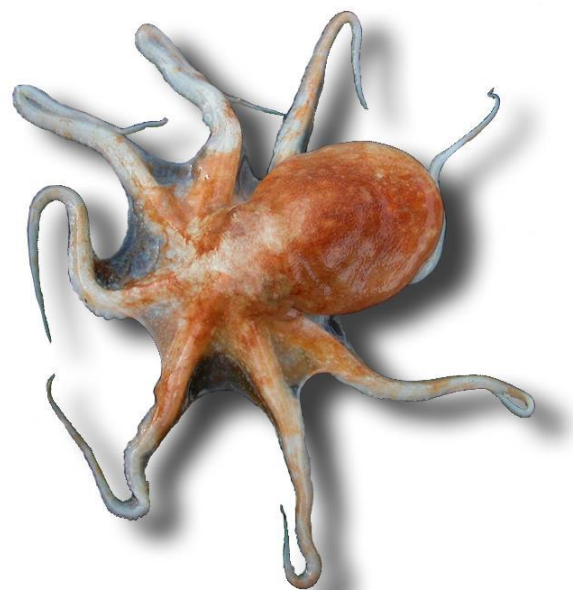
Guerra (1992)

Distribution: *E. cirrhosa* extends in the North-East Atlantic from the south of Iceland southwards to the Moroccan coastline and the Mediterranean Sea. Widely distributed in the North Sea (including the Kattegat and Skagerrak).

Habitat: Sedentary species, mostly found on soft substrate. Prefers habitats with a minimum depth of 30 meters but can be found between 10 and 30 meters in some areas. Additionally, *E. cirrhosa* may be observed in rock pools above the tide level.



ICES (2015)



ICES (2015)

OCTOPUSES (*OCTOPODA*)

Eledone moschata

(Lamarck, 1798)

Order Octopoda

Family Eledonidae

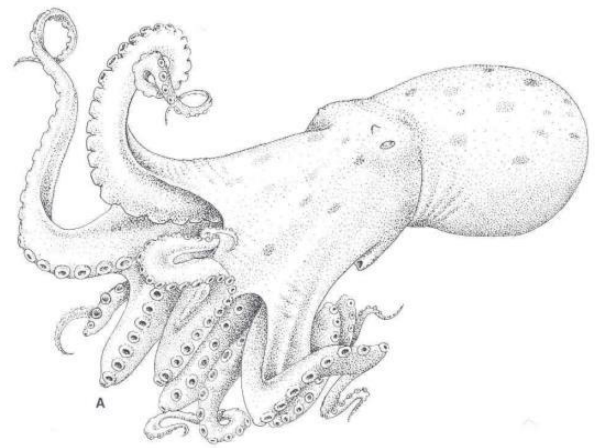
Genus *Eledone*

Common name: Musky octopus (UK); Elédone musquée (France); Moscardino rosso, moscardino muschiato (Italy); Polvo cabeçudo, polvo mosqueado, polvo-de-cheiro (Portugal); Pulpo cabezón, pulpo almizclado (Spain); Karnita tal misk (Malta); Muscardin (Monaco); Μοσκιός (Greece); Bou msik (Tunisia); Moschuskrake (Germany)

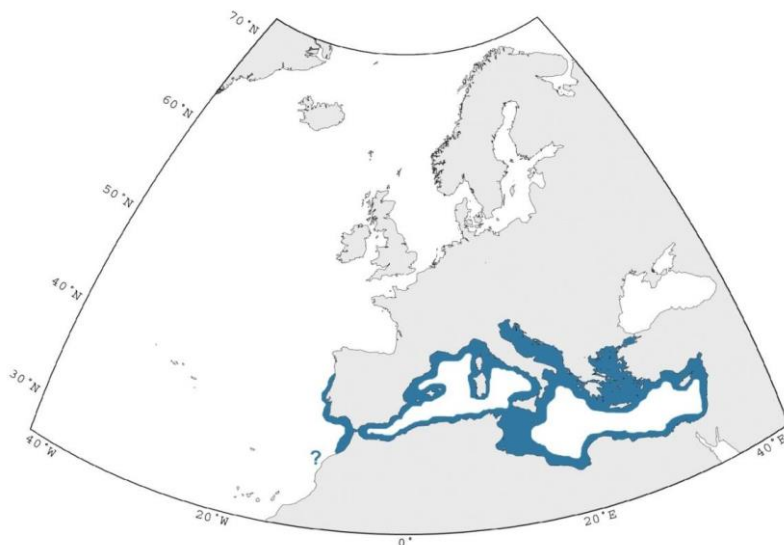
Description: Moderate-sized species with a mantle length of up to 18.8 cm and a body weight of up to 1,4 kg in the Mediterranean Sea, whereas animals in the Atlantic Ocean tend to be smaller with a maximum mantle length of 15 cm and body weight of 640 g. Arms reach 2.3 to 3 times the mantle length and have one row of suckers. Spawning season throughout most of the year with several peaks within spring, while little to no spawning can be observed during summer.

Distribution: The geographical distribution of *E. moschata* is limited to the Mediterranean Sea and the Gulf of Cádiz in the Atlantic Ocean. Occasionally, it can also be found along the west coast of Portugal. The southern limits in the Atlantic Ocean remain uncertain, as *E. moschata* might be inhabiting the Moroccan coast as well.

Habitat: Depth range of 10 – 300 meters. Typically occurs on muddy and sandy substrate, occasionally on gravel. Less abundant in rocky areas.



Guerra (1992)



ICES (2015)



ICES (2015)

OCTOPUSES (*OCTOPODA*)

Macrotritopus defilippi

(Vérany, 1851)

Order Octopoda

Family Octopodidae

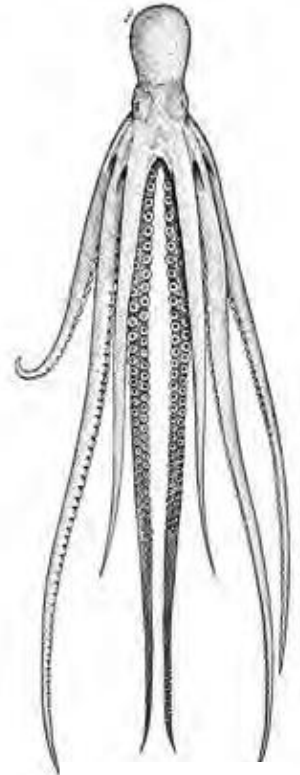
Genus *Macrotritopus*

Common name: Lilliput longarm octopus (UK); Poulpe à longs bras (France); Pulpito patilargo (Spain); Polpetto braccialunghe (Italy)

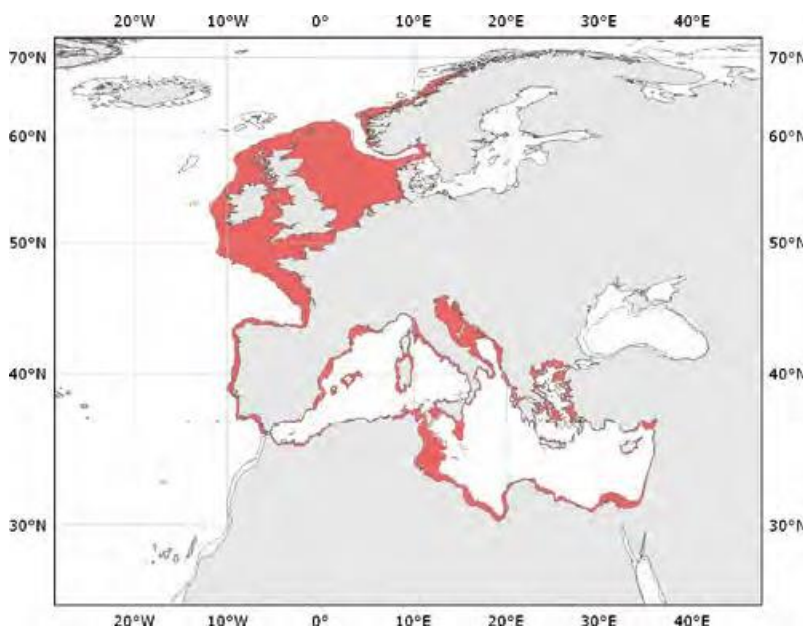
Description: Maximum mantle length of 5.5 cm. Mantle small compared to total length. Arms are long, slender and have two rows of suckers. Little is known about the spawning or migration behaviour of this species.

Distribution: *M. defilippi* can be found along the coastlines of the North Sea, the North-East Atlantic and the Mediterranean Sea.

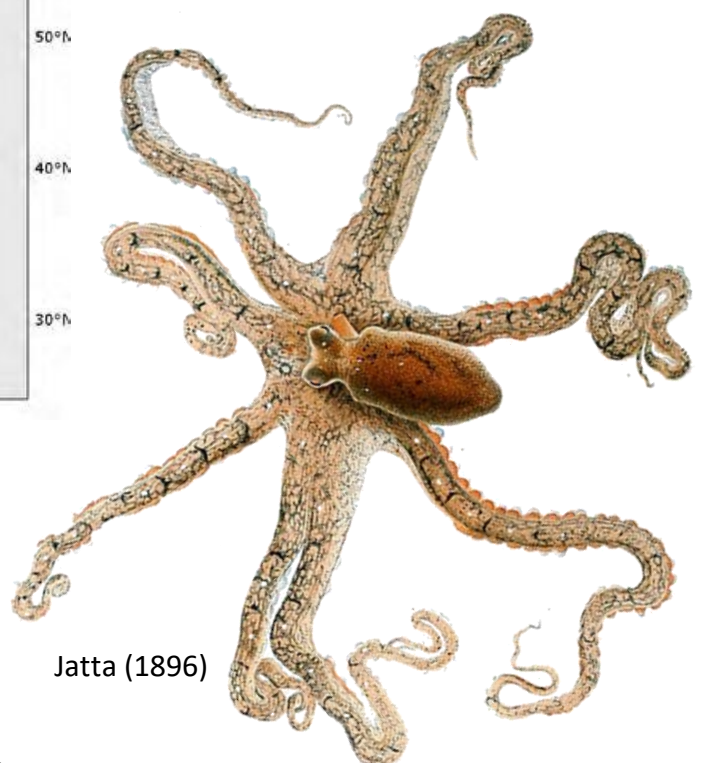
Habitat: Depth range of 5 to 200 meters but prefers shallow waters with muddy or sandy bottoms. *M. defilippi* can bury itself in the substrate without leaving any visual trace of its position. This species was observed to mimic the behaviour of bottom dwelling flounders to avoid predation.



FAO (2016)



FAO (2016)



Jatta (1896)

OCTOPUSES (*OCTOPODA*)

Octopus vulgaris

(Cuvier, 1797)

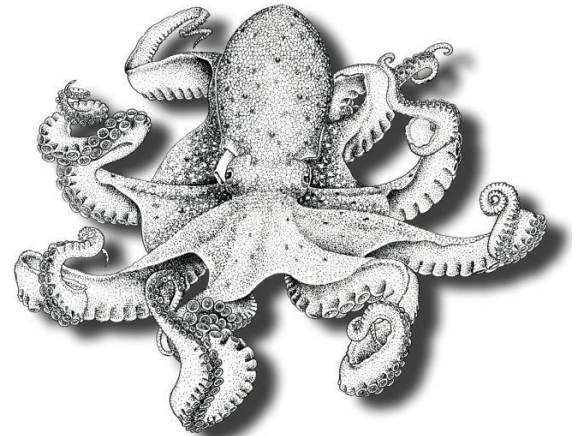
Order Octopoda

Family Octopodidae

Genus Octopus

Common name: Common octopus (UK); Pulpo (Spain); Polvo (Portugal); Pieuvre (France); Polpo comune, Polpo verace, Polpo (Italy); Chtapodi (Greece); Gemeiner Krake (Germany)

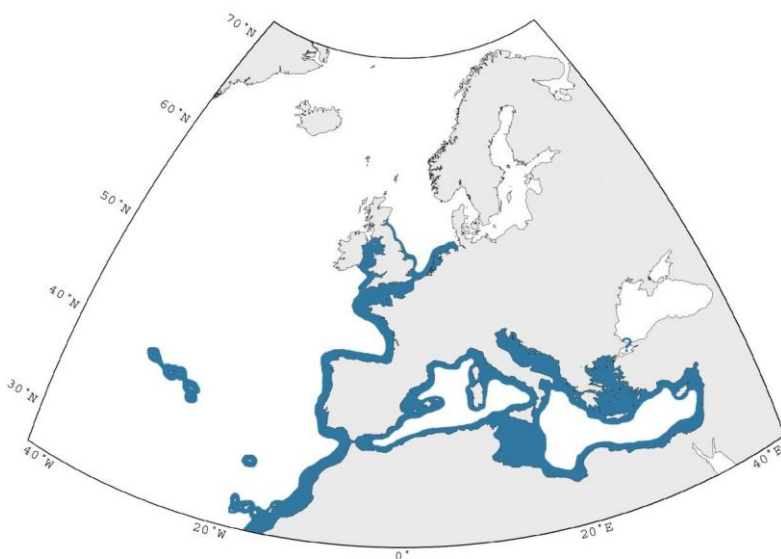
Description: Shallow water species. Common mantle length of 25 cm, but some exemplars may reach a mantle length of 40 cm and a total length of 140 cm. Muscular arms with two rows of suckers, 3 to 5 times the length of mantle. Common weight around 2kg. Spawning season extends throughout the whole year with a peak in June/July in the Mediterranean Sea.



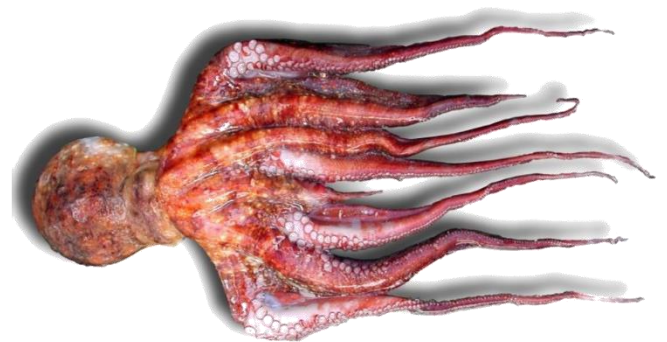
Guerra (1992)

Distribution: *O. vulgaris* is commonly found in the North-East Atlantic and the Mediterranean Sea. In the North-East Atlantic, it extends from Ireland along the Iberian Peninsula until Cape Verde Islands and the equator region. Sporadic findings in the South North Sea. Very abundant around the Atlantic archipelagos (Azores, Madeira, Canary Islands) and in the Mediterranean Sea.

Habitat: Primarily found in shallow waters but occupies coastal regions down to a depth of 200 meters. Very abundant in areas of high presence of solid material (stones, rocks, shells, anthropogenic litter, etc) which is utilised for den construction.



ICES (2015)



ICES (2015)

OCTOPUSES (*OCTOPODA*)

Ocythoe tuberculata

(Rafinesque, 1814)

Order Octopoda

Family Ocythoidae

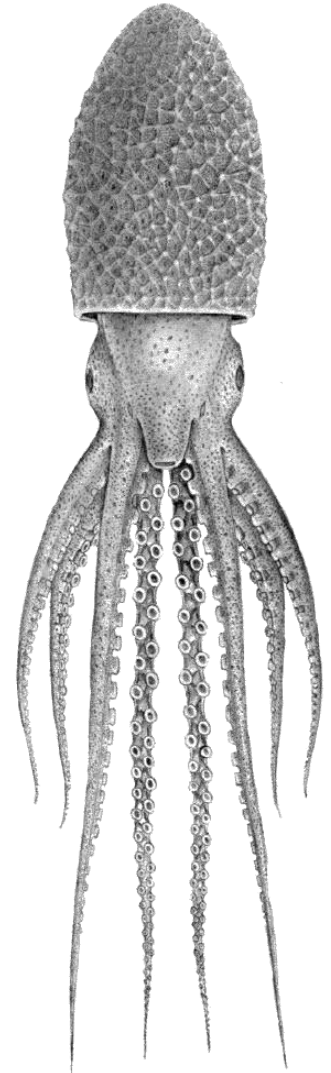
Genus *Ocythoe*

Common name: Football octopus, tuberculata octopus (UK); Poulpe balonné (France); Pulpo abalonado (Spain)

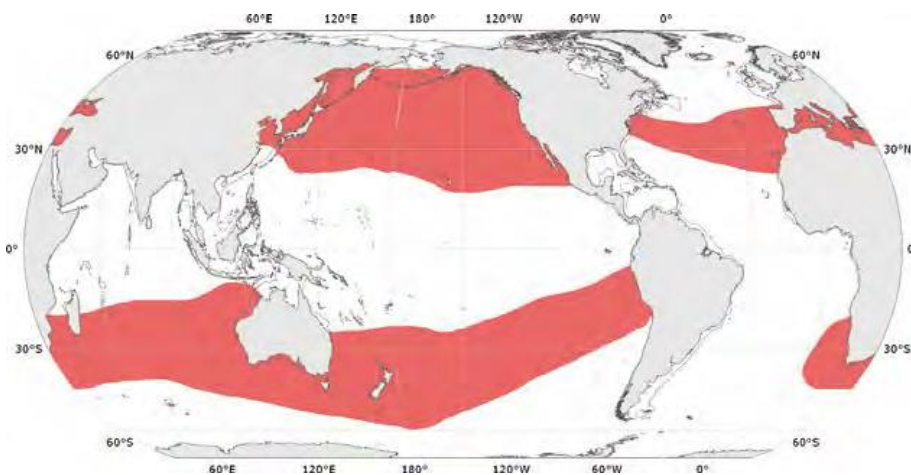
Description: Distinct sexual dimorphism. While females' mantle length is around 31 cm and their total length up to 96 cm, males dwarfed with a maximum mantle length of 3cm and a total size of around 7 cm. Long arms with two rows of suckers. Females of the genus *Ocythoe* are one of the few cephalopods with a swimbladder and the only known cephalopods which are ovoviviparous (giving birth to live young that hatched internally).

Distribution: Worldwide distribution in temperate oceans. In European waters, *O. tuberculata* can be found in the Mediterranean Sea and in the Atlantic Ocean along the North-West Iberian coastline until the Bay of Biscay.

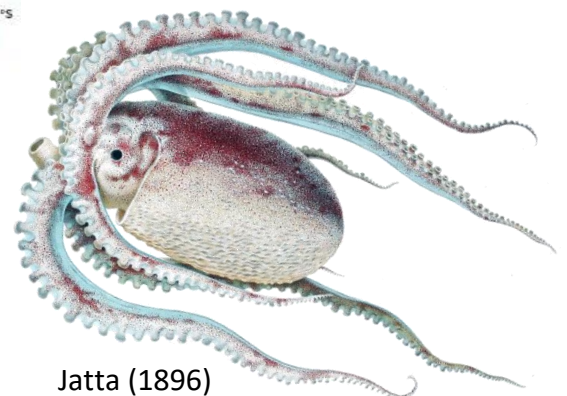
Habitat: Although this species is considered as oceanic, it is commonly found around land masses and islands. While the daytime habitat is unknown (probably around 100 - 200 meters), *O. tuberculata* migrates to the surface at night.



Young (1972)



FAO (2016)



Jatta (1896)

OCTOPUSES (*OCTOPODA*)

Tremoctopus violaceus

(Delle Chiaje, 1830)

Order Octopoda

Family Tremoctopodidae

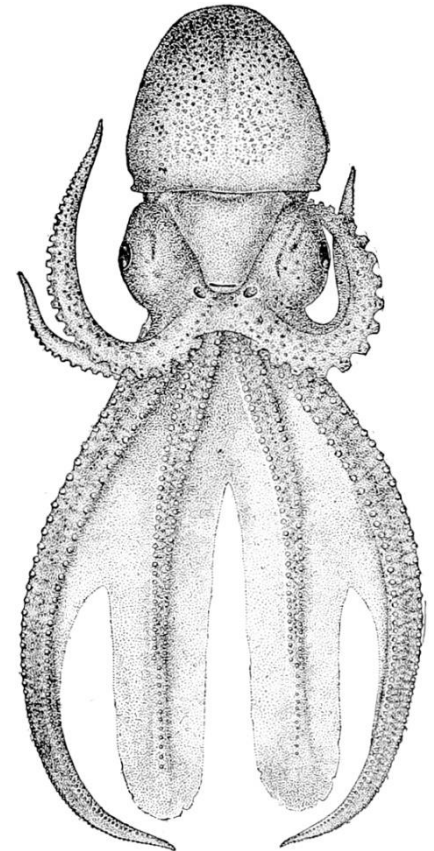
Genus *Tremoctopus*

Common name: Violet blanket octopod, common blanket octopus (UK); Poulpe manteau violet (France); Pulpo manta violaceo (Spain); Polpo palmato (Italy)

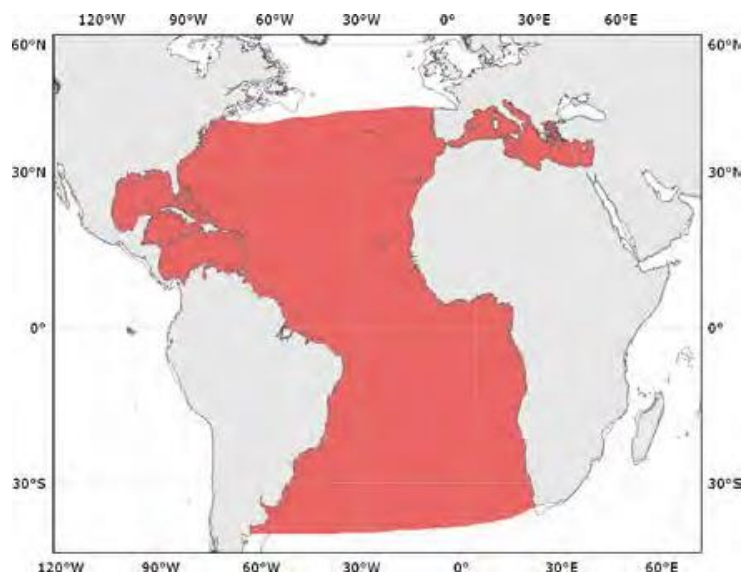
Description: Extreme degree of sexual dimorphism. While the female reaches a mantle length of 25 cm and a total length of up to 2 meters with a maximum weight of 10 kg, the dwarfed males' mantle length is just around 1,5 cm with an average weight of 0,25 g. Adult females with a web between their arms, which serves as a defensive mechanism (appearing bigger and predator distraction) and is only extended when the animal is threatened. Males and juvenile females have been observed to carry broken tentacles of the Portuguese man o' war (a jellyfish-like hydrozoan) as a defensive mechanism.

Distribution: Widespread, pelagic species which occurs in the Central and South Atlantic Ocean and several adjacent marginal seas. In Europe, this species can be found in the Mediterranean Sea and along the west coast of the Iberian Peninsula.

Habitat: Oceanic species, which migrates to the surface at night as well as occasionally during day time.



Berry (1914)



FAO (2016)



Image by Cassandra LeMasurier

CUTTLEFISH (*SEPIIDA*)

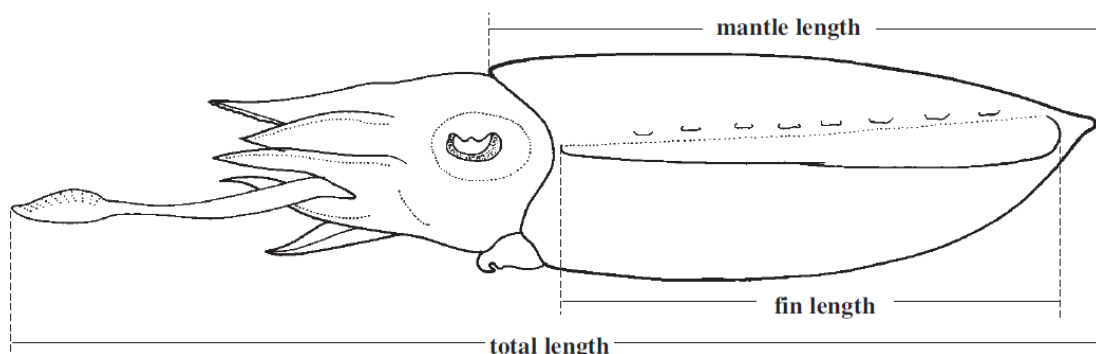
Introduction

Cuttlefish are marine cephalopods, belonging to the order *Sepiida*. Despite their name, cuttlefish are molluscs (like all other cephalopods) and are not related to any fish species. They are commonly found in shallow waters and no deep-sea species exist due to the presence of their cuttlebone. This aragonite-based structure forms the inner shell of all cuttlefish and serves as a buoyancy device but becomes fragile in great depth due to the ambient pressure. Similar to squids, cuttlefish have eight arms and two tentacles. As typical for cephalopods, they usually reach a short life span of several months up to two years.

To avoid predation, cuttlefish are able to eject an ink cloud but are particularly known as the “chameleons of the ocean” as they can alter their skin colour and skin roughness rapidly. This ability is not only used for camouflaging but also as a mean of communication.

During mating season, male cuttlefish will grab females with their tentacles, turning them into a face-to-face position and eventually inserting their sperm with a specialised arm into an opening near the female’s mouth. Cuttlefish mainly prey on fish and crustaceans but evolved different hunting techniques. While some species blend into the ambient surrounding and wait for prey to swim by, other species swim along the bottom and shoot jets of water into the sand to uncover buried prey. Few species are also known to use rapid colour changes to hypnotise and stun their prey.

The size of cuttlefish is normally characterised by measuring the corresponding mantle length, as shown in the figure below:



FAO (2005)

CUTTLEFISH (*SEPIIDA*)

Sepia elegans

(Blainville, 1827)

Order Sepiida

Family Sepiidae

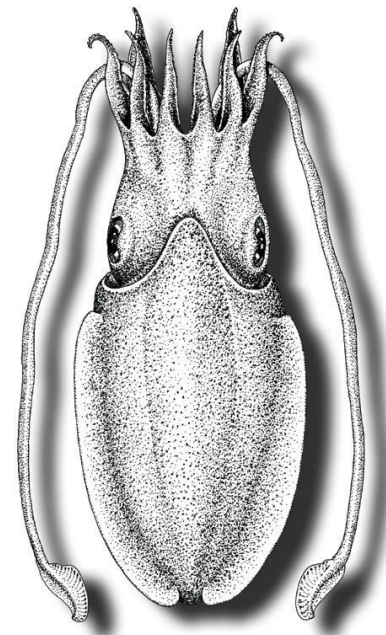
Genus *Sepia*

Common name: Elegant cuttlefish (UK); Seiche élégante (France); *Seppia elegante* (Italy); Choco-elegante (Portugal); Choquito, castaño (Spain)

Description: Small species. Males up to 7,2 cm mantle length, females up to 8,9 cm. Mantle is oblong and more than twice as long as wide. The total weight varies between 50 and 60 g. Skin colour reddish-brown.

Distribution: North-East Atlantic from Scotland and Ireland down to Namibia. Absent from the North Sea, but widely distributed throughout the Mediterranean Sea.

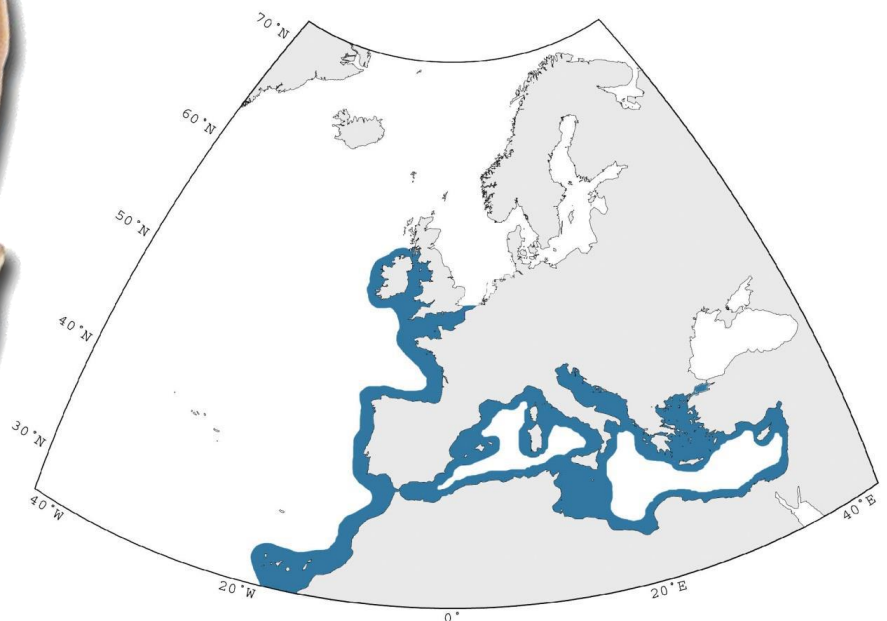
Habitat: Sublittoral species which lives on sandy and muddy bottoms. Can be found from very shallow waters around to 2 meters down to nearly 500 meters. *S. elegans* spends the winter in deeper, offshore waters but migrates into the shallows in spring and summer.



Guerra (1992)



Image by A. M. Arias



ICES (2015)

CUTTLEFISH (*SEPIIDA*)

Sepia officinalis

(Linnaeus, 1758)

Order Sepiida

Family Sepiidae

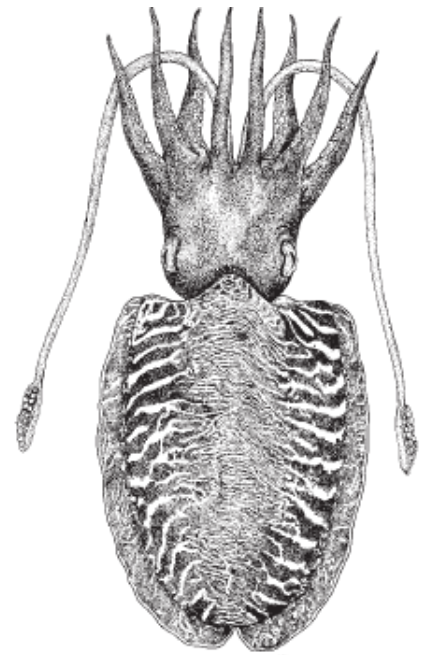
Genus Sepia

Common name: Common cuttlefish (UK); Seiche commune (France); Σουπιά [soupia] (Greece); Seppia comune (Italy); Choco vulgar, choco (Portugal); Sepia común, sepia, choco, jibia (Spain); Gewöhnlicher Tintenfisch (Germany)

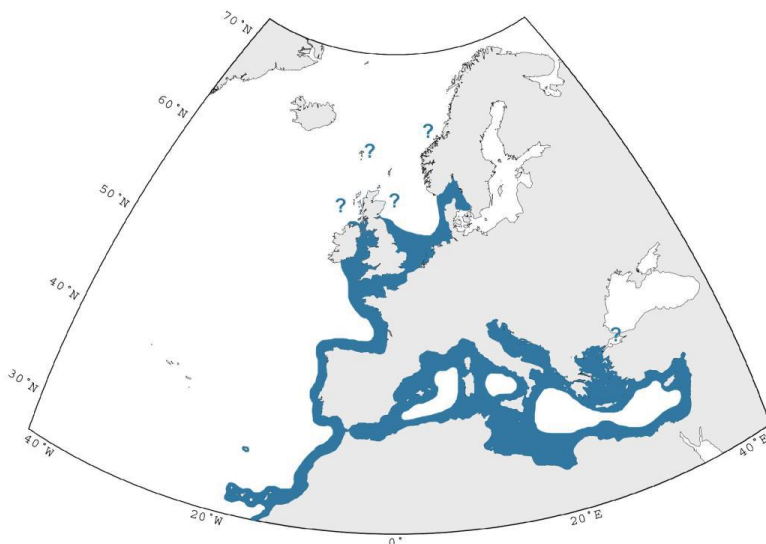
Description: Common mantle length between 25 and 30 cm but some exemplars exhibit a mantle length of 45 cm, reaching a total weight of nearly 4 kg. Moderately wide fins. Skin colour light brown, during breeding season a zebra stripe pattern can be observed on the mantle.

Distribution: North-East Atlantic from Ireland and Scotland southwards to Mauritania as well as the Central and South North Sea and the Mediterranean Sea. Sporadic findings along the south and west coast of Norway, around the Faroe Islands and in the Baltic Sea are probably due to occasional incursions of Atlantic waters.

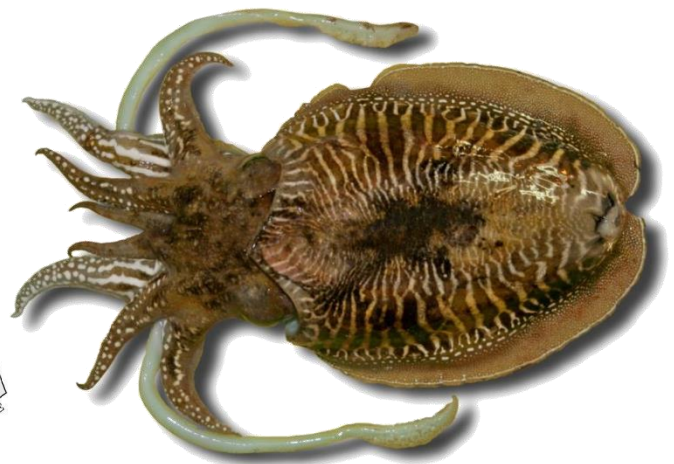
Habitat: Depth range from 0 – 200 meters along the continental shelf, predominantly found on sandy and muddy substrate covered by algae and seagrass. During autumn and winter months, *S. officinalis* migrates into deeper, offshore waters. This species can bury itself in soft bottom substrate and juveniles commonly attach themselves to hard substrate to withstand strong water movements.



FAO (2005)



ICES (2015)



ICES (2015)

CUTTLEFISH (*SEPIIDA*)

Sepia orbignyana

(Férussac [in d'Orbigny], 1826)

Order Sepiida

Family Sepiidae

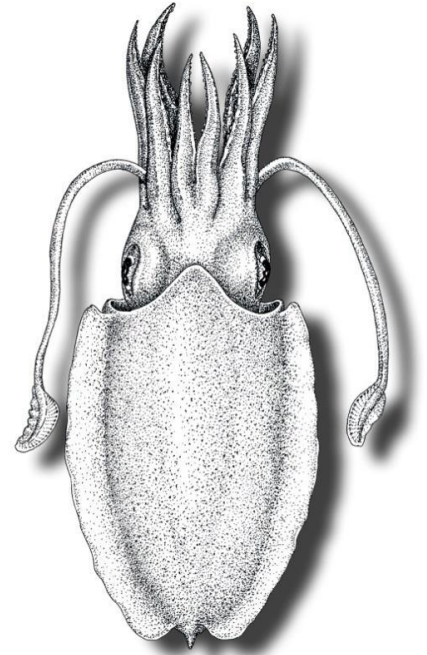
Genus *Sepia*

Common name: Pink cuttlefish (UK); Seiche rosée (France); Κοκκινοςουπιά [kokkinosoupiá] (Greece); Seppia pizzuta (Italy); Choco-de-cauda (Portugal); Choquito picudo (Spain)

Description: Mantle oval-shaped, up to 9,6 cm long for males and up to 12 cm long for females. Reddish-brown colouration.

Distribution: Eastern Atlantic Ocean, from the Irish Sea down to southern Angola. Also commonly found in the Mediterranean Sea.

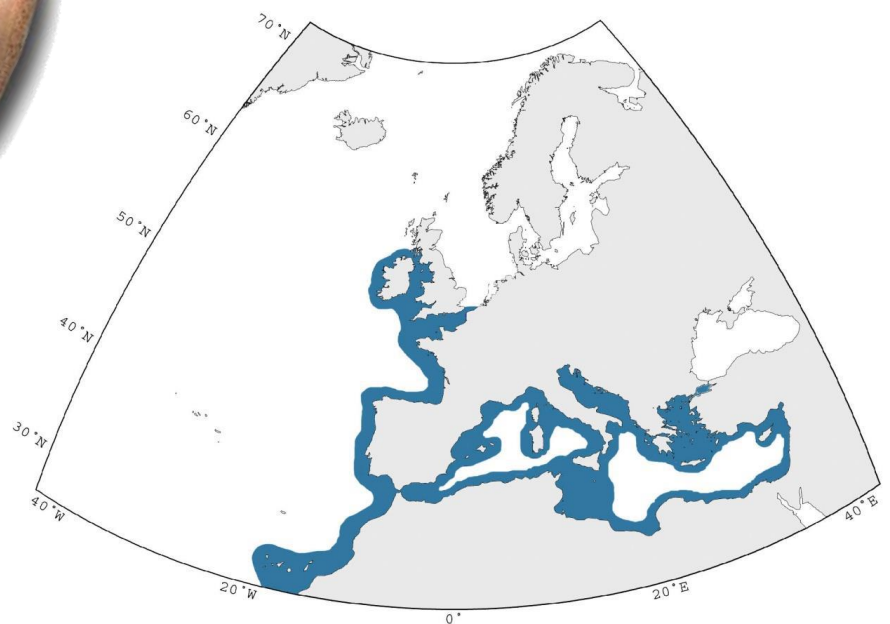
Habitat: Depth range from 15 to 570 meters, but most abundant between 50 and 250 meters. *S. orbignyana* mainly occurs on sandy and muddy bottoms. No migration behaviour was ever observed, and males and females are usually found together throughout the whole year.



Guerra (1992)



Image by
A. M. Arias



ICES (2015)

BOBTAIL SQUIDS (*SEPIOLIDA*)

Introduction

Despite their name, bobtail squids are much closer related to cuttlefish than to squids. In general, they have a rounder mantle than cuttlefish but lack a cuttlebone. Similar to squids and cuttlefish, they have eight arms and two additional tentacles.

Bobtail squids are among the smallest cephalopods, reaching sizes between 1 and 8 cm. They are usually found in shallow waters where they spend the daytime buried in the sand. During night, they emerge and hunt for prey. To avoid predation and be less likely detectable, bobtail squids undergo a symbiotic relationship with bioluminescent bacteria. While the bobtail squid provides a sugary solution to the bacteria, it uses the bioluminescence of those bacteria to eliminate its own shadow at night. In case they still get found or disturbed by a predator, they can eject an ink cloud to confuse the attacker and use the moment to escape. Compared with other cephalopods, bobtail squids have one of the highest brain-to-body mass ratios.

The size of bobtail squids is normally characterised by measuring the corresponding mantle length. Due to the big similarity with cuttlefish, different body length definitions can be taken from the cuttlefish figure which can be found on page 16.

BOBTAIL SQUIDS (*SEPIOLIDA*)

Rossia macrosoma

(Delle Chiaje, 1830)

Order Sepiida

Family Sepiolidae

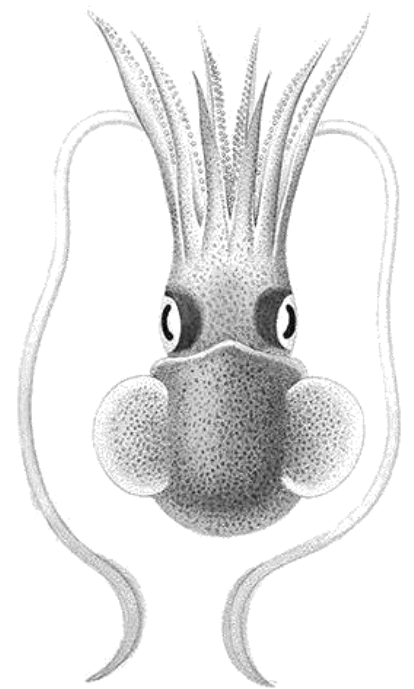
Genus *Rossia*

Common name: Stout bobtail squid (UK); Sépiole melon (France); Choco, Chopito globito robusto (Spain); Seppiola grossa, Babbunedda, Cape e chiuove, Capo di chiodo, Purpo seccia, Vurpascele (Italy); Sepiole (Morocco)

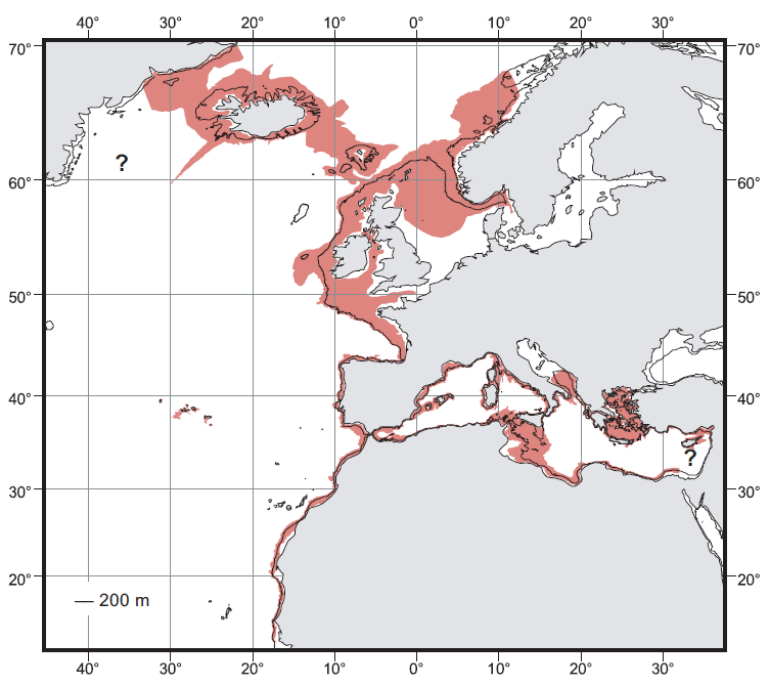
Description: Moderately large species. Mantle length usually between 2 and 6 cm, in some exemplars up to 8,5 cm. Mantle smooth, soft and dome-shaped. Head and mantle are not joined. Skin colour light yellowish brown to dark reddish brown.

Distribution: North-East Atlantic from Greenland and Iceland southwards to the Senegal as well as the Mediterranean Sea (except for the northern Adriatic Sea and south-eastern Levantine Sea). Absent from the southern North Sea but can be found along the western and southern coastline of Norway.

Habitat: Depth range from 32 – 899 meters, preferably found on sandy and muddy substrate. During winter, *R. macrosoma* prefers deeper offshore waters but migrates for spawning activities to shallower coastal zones for the rest of the year. As all member of the genus *Rossia*, *R. macrosoma* typically buries itself in soft sediments during daytime and moves at night for feeding.



d'Orbigny (1855)



FAO (2005)



Image by Bernard Picton

BOBTAIL SQUIDS (*SEPIOLIDA*)

Sepietta neglecta

(Naef, 1916)

Order Sepiida

Family Sepiolidae

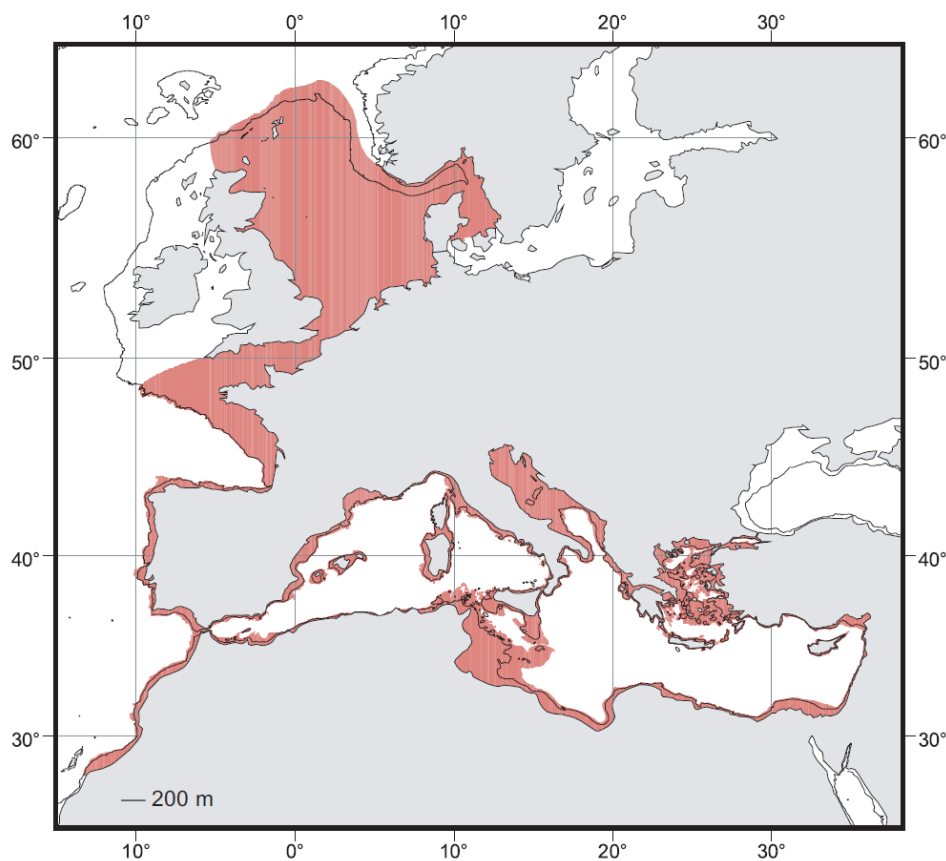
Genus *Sepietta*

Common name: Elegant bobtail squid (UK); Sépiole élégante (France); Sepieta elegante (Spain)

Description: Slender, elongate body. Mantle length up to 3,3 cm. Fins rounded rather than curved. Very thin tentacles.

Distribution: North Sea, Skagerrak, Kattegat, British Channel, Atlantic coastline of France, the Iberian Peninsula and Morocco as well as the Mediterranean Sea.

Habitat: This species prefers muddy substrates within the depth range of 25 to 475 meters. Spends the day buried in the sand and emerges at night for feeding.



FAO (2005)

BOBTAIL SQUIDS (*SEPIOLIDA*)

Sepietta obscura

(Naef, 1916)

Order Sepiida

Family Sepiolidae

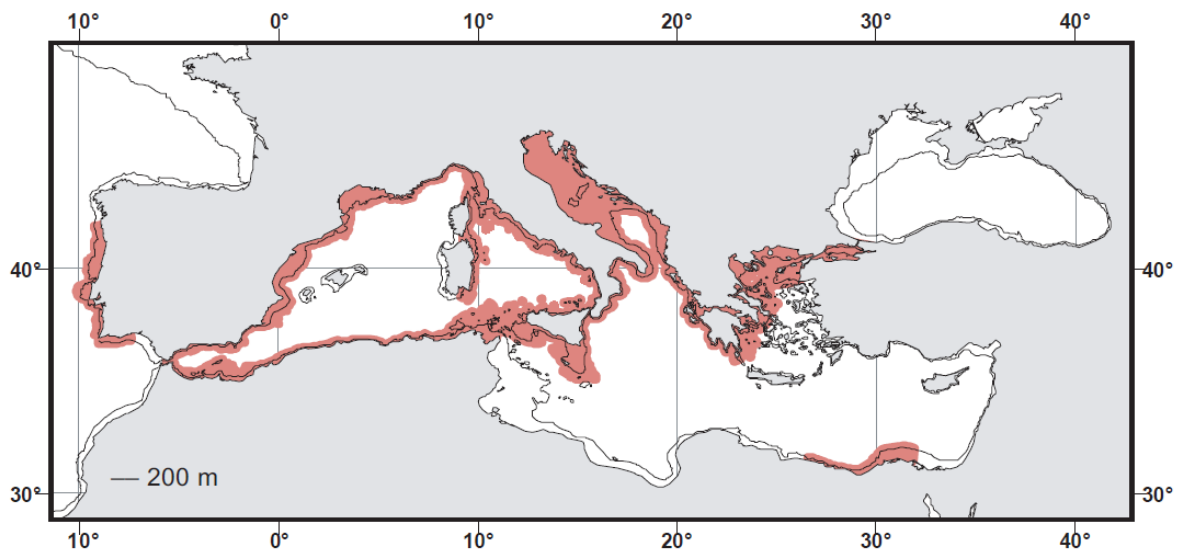
Genus *Sepietta*

Common name: Mysterious bobtail squid (UK); Sépiole mystérieuse (France); *Sepietta misteriosa* (Spain); *Seppiola misteriosa* (Italy)

Description: Males up to 1,9 cm mantle length, females up to 3 cm mantle length. Small, short fins; tentacles relatively robust. Skin colouration reddish to dark brown.

Distribution: **Western** Mediterranean Sea (including the western Mediterranean Sea, the Adriatic Sea, the Aegean Sea and the southern Levantine Sea) and the Portuguese Atlantic coastline. Probably absent from the Gulf of Cádiz.

Habitat: This species can mostly be found within 27 to 376 meters on sandy and muddy substrate, preferably colonised by the Mediterranean tapeweed *Posidonia oceanica*. Significant vertical migrations of this species were observed, probably to track prey.



FAO (2005)

BOBTAIL SQUIDS (*SEPIOLIDA*)

Sepietta oweniana

(d'Orbigny [in Férussac & d'Orbigny], 1839-1841)

Order Sepiida

Family Sepiolidae

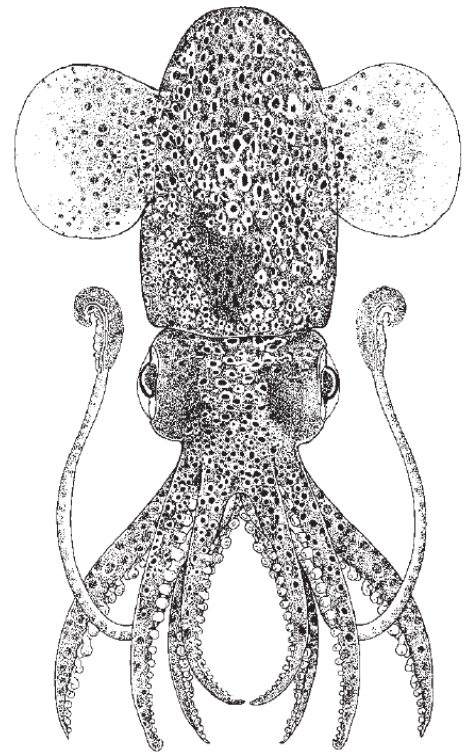
Genus *Sepietta*

Common name: Common bobtail squid (UK); Sépiole commune (France); *Sepietta común* (Spain); *Seppiola comune*, *Cappuccetto* (Italy)

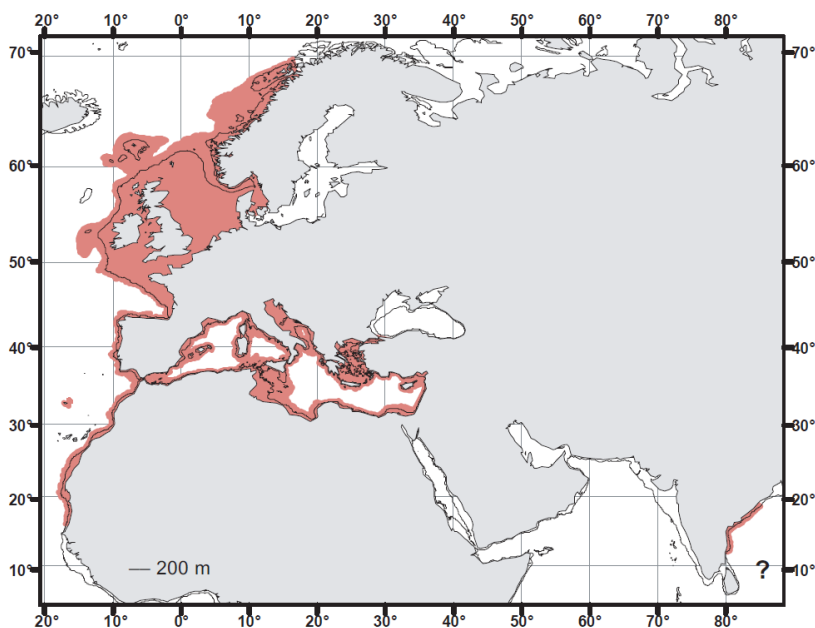
Description: Dome-shaped mantle with wide, rounded fins. Moderately large species. Mantle length up to 5 cm in the North Sea, whereas exemplars from the Mediterranean Sea tend to have shorter mantles (males up to 3,5 cm, females up to 4 cm).

Distribution: North-East Atlantic from the Faroe Islands and Norway southwards to Madeira and Mauretania as well as the Mediterranean Sea. Potentially also inhabiting the eastern coastline of India. *S. oweniana* may occur in Icelandic waters as in recent years an expansion of its northern range was detected.

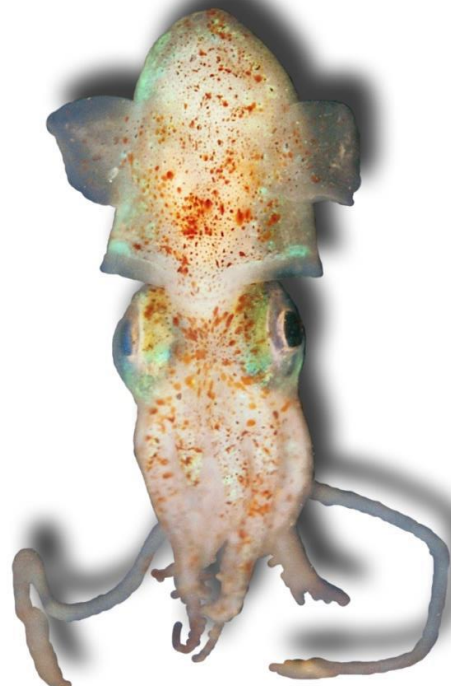
Habitat: Wide depth range from 8 – 1000 meters. This species prefers soft, muddy bottoms. Seasonal migration to shallower onshore waters in late winter and early spring, followed by mating and spawning season during spring, summer and early autumn. Vertical migration to track prey was also observed. Nocturnal species which spends daytime buried in the substrate.



FAO (2005)



FAO (2005)



ICES (2015)

BOBTAIL SQUIDS (*SEPIOLIDA*)

Sepiola affinis

(Naef, 1912)

Order Sepiida

Family Sepiolidae

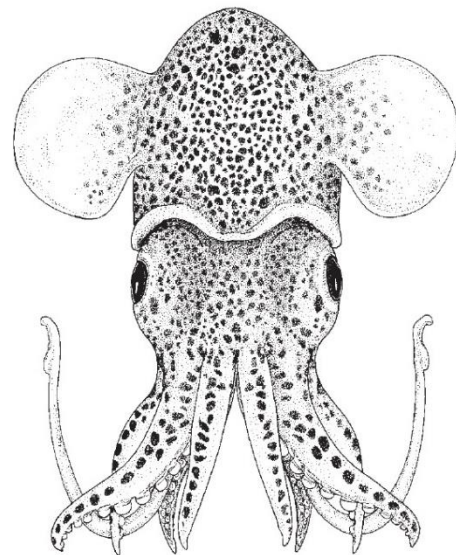
Genus *Sepiola*

Common name: Analogous bobtail squid (UK); Sépiole analogue (France); *Sepiola análoga* (Spain); *Seppiola affine*, Cappuccetto (Italy)

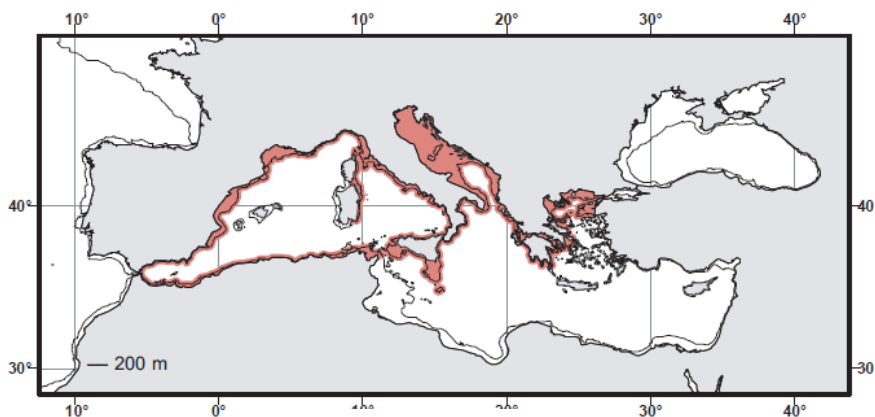
Description: Mantle up to 2,5 cm long, head with prominent eyes, fins wide and rounded. Dark brown skin colour with large, violet-brownish chromatophores.

Distribution: Endemic to the Mediterranean Sea. Its geographical distribution includes the western Mediterranean Sea, the Adriatic Sea and the northern Aegean Sea.

Habitat: Commonly abundant between 15 and 30 m but can be found down to 150 meters. *S. affinis* prefers sandy and sandy-muddy bottoms to bury itself during daytime. This species is known to exhibit several colour patterns with rapid colour variations while preying.



FAO (2005)



FAO (2005)



Image by Stefano Guerrieri di Livorno



Image by Alessandro Falleni

BOBTAIL SQUIDS (*SEPIOLIDA*)

Sepiola intermedia

(Naef, 1912)

Order Sepiida

Family Sepiolidae

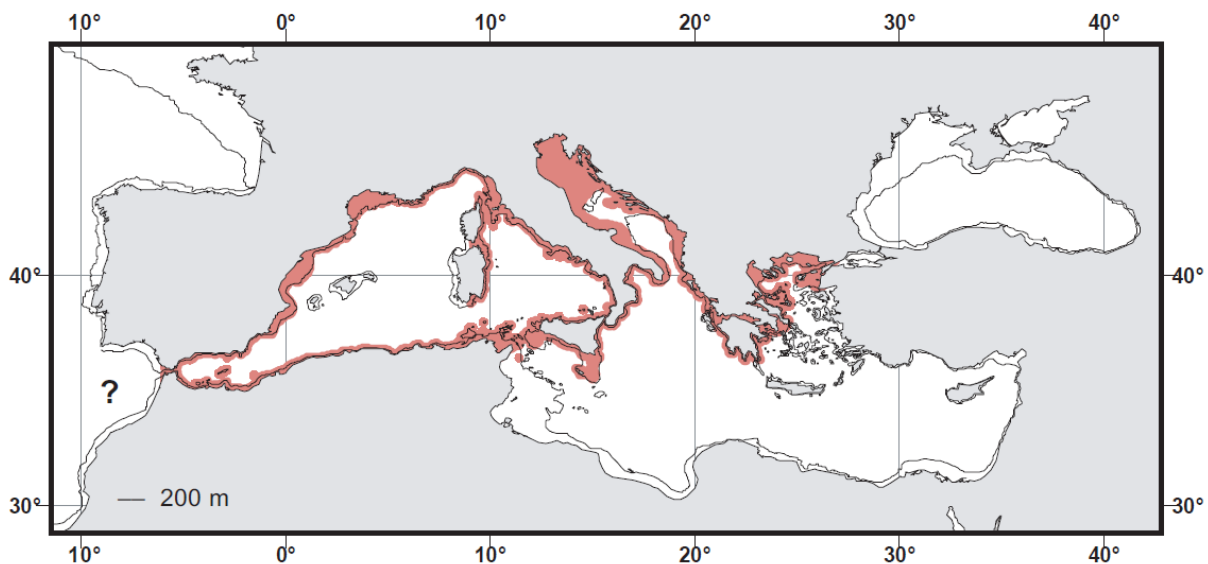
Genus *Sepiola*

Common name: Intermediate bobtail squid (UK); Sépiole intermédiaire (France); *Sepiola intermedia* (Spain); *Seppiola intermedia*, Cappuccetto (Italy)

Description: Mantle length up to 2,6 cm for males and up to 2,8 cm for females. Short, rounded fins which are not exceeding the mantle length. Very delicate tentacles. Dark coffee brownish colouration with large chromatophores loosely distributed over the mantle surface.

Distribution: Mostly common in the western Mediterranean Sea as well as the Adriatic Sea and the northern Aegean Sea. As some exemplars were found western of the Strait of Gibraltar, this species might also be found in the Bay of Cádiz and along the Moroccan shoreline.

Habitat: *S. intermedia* mainly prefers muddy bottoms within a depth range of 60 – 200 meters. However, in the Adriatic and Tyrrhenian Seas, this species is very abundant in shallow waters from 8 m downwards where it can be found on sandy substrate associated with the sea snail *Turritella communis*, the sea star *Astropecten bispinosus* and the brittle star *Ophiura texturata*.



FAO (2005)

BOBTAIL SQUIDS (*SEPIOLIDA*)

Sepiola robusta

(Naef, 1912)

Order Sepiida

Family Sepiolidae

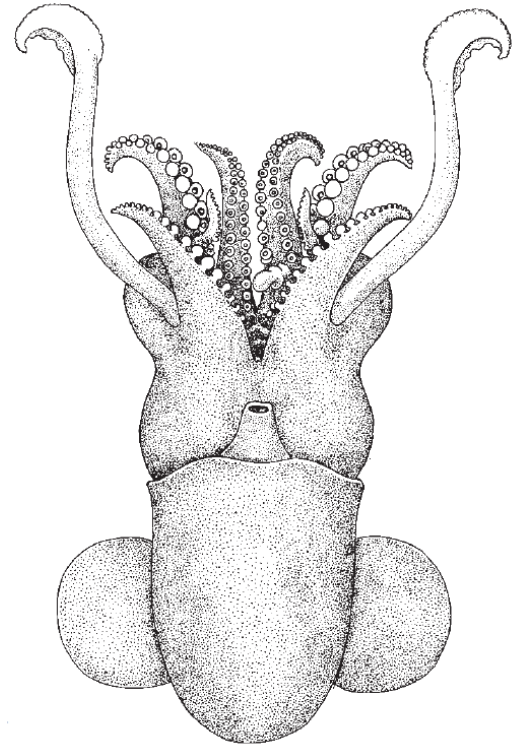
Genus *Sepiola*

Common name: Robust bobtail squid (UK); Sépiole robuste (France); *Sepiola robusta* (Spain); *Seppiola robusta*, Cappuccetto (Italy)

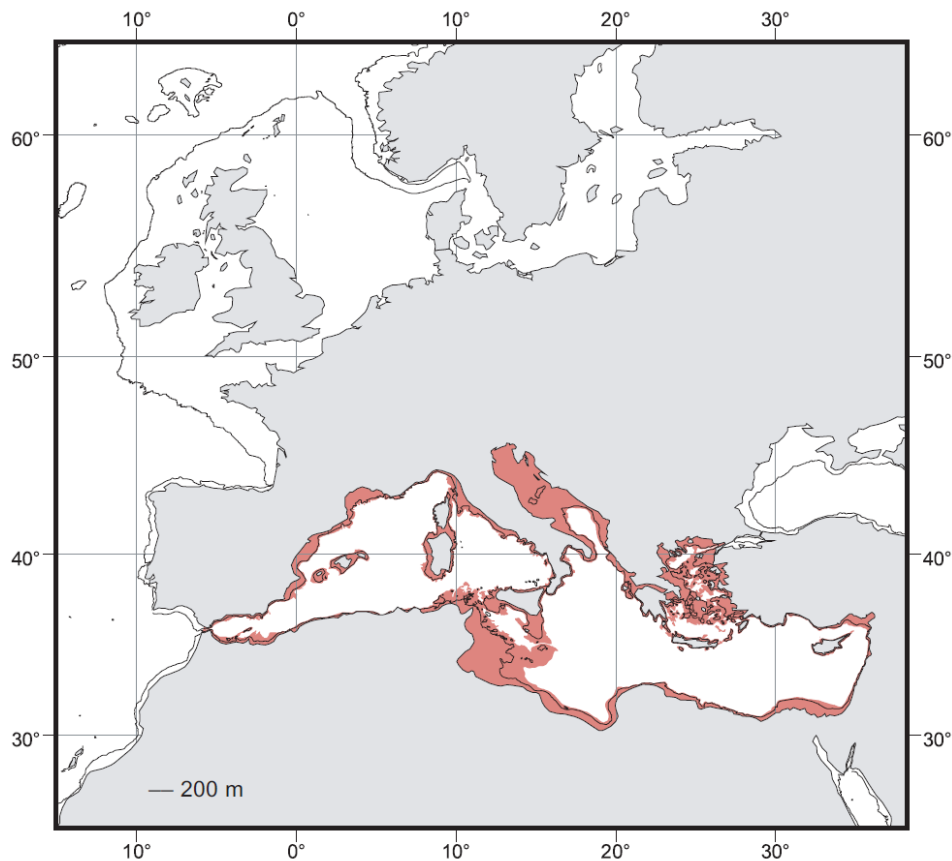
Description: Males up to 2,5 cm mantle length, females up to 2,8 cm mantle length. Short fins which are not exceeding the mantle length.

Distribution: Endemic to the Mediterranean Sea but absent from the Marmara and Black Sea.

Habitat: Depth range from 26 to 498 meters but mainly found on the outer shelf.



FAO (2005)



FAO (2005)

BOBTAIL SQUIDS (*SEPIOLIDA*)

Sepiola rondeleti

(Leach, 1817)

Order Sepiida

Family Sepiolidae

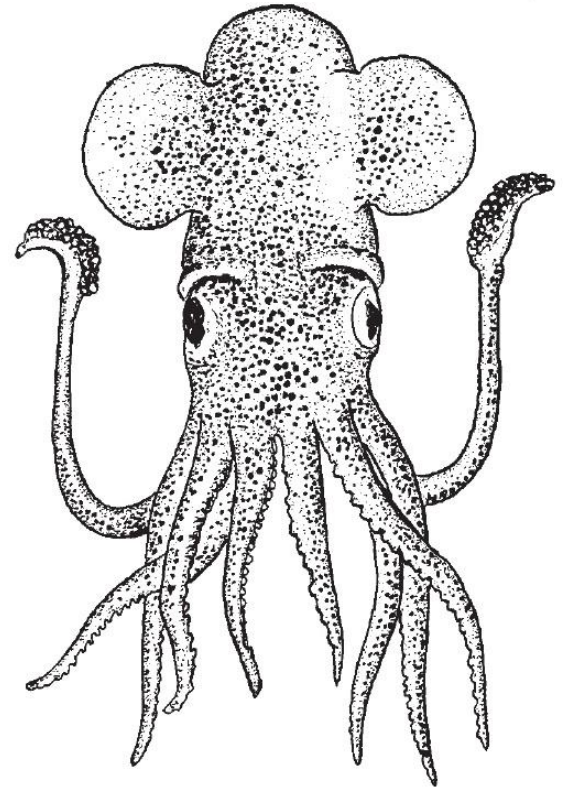
Genus *Sepiola*

Common name: Dwarf bobtail squid (UK); Sépiole naine (France); *Sepiola enana* (Spain); *Seppiola di Rondelet*, *Cappuccetto* (Italy)

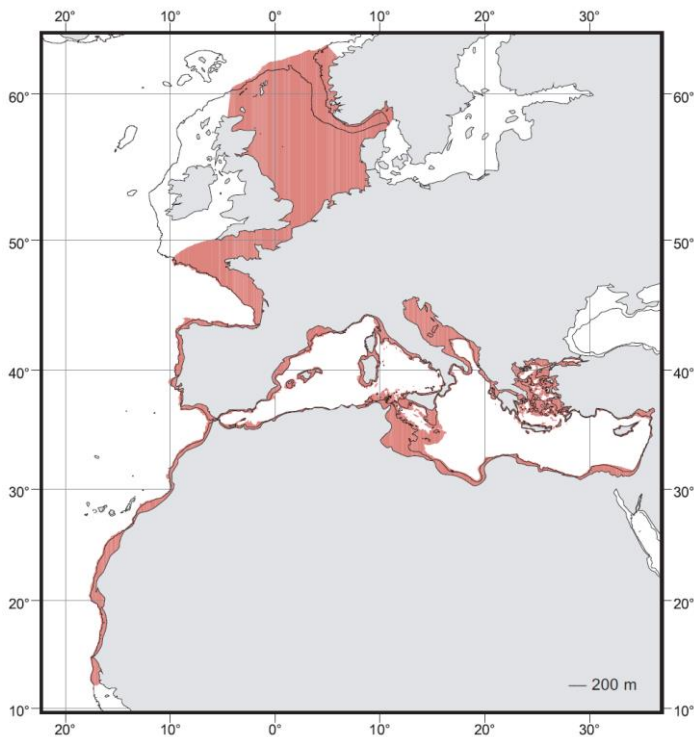
Description: Males up to 2,5 cm mantle length, females commonly found with a mantle length of 4 - 5 cm, but some exemplars up to 6 cm. Short fins which are not exceeding the mantle length.

Distribution: North-East Atlantic, where *S. rondeleti* extends its range from the Norwegian Sea and North Sea southwards to Senegal, as well as the Mediterranean Sea.

Habitat: Although being found down to around 450 m, this species usually prefers shallow waters down to 35 meters with sandy and muddy bottoms as well as seagrass meadows of the genus *Posidonia*.



FAO (2005)



FAO (2005)



NATUURLIJKMOOI.NET 2005 Selce - HR

Photo by © natuurlijkmooi.net

SQUIDS (*TEUTHIDA*)

Introduction

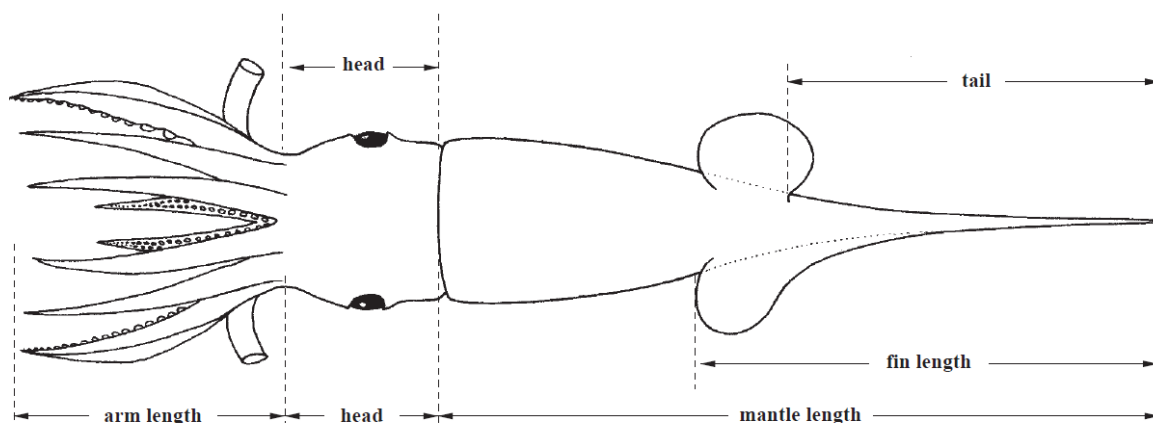
Squids (*Teuthida*) belong to the cephalopods and can be divided into two sub-orders, *Myopsida* and *Oegopsida*. While members of the *Myopsida* are commonly found in coastal areas, feeding on or near the bottom, members of the *Oegopsida* are usually pelagic and oceanic.

Squids have eight arms and two additional, longer tentacles. They have an inner shell, the so-called gladius or pen, which supports the squid's mantle and serves as an attachment point for muscles. Their life expectancy seems to range from a few months to one or two years, although several larger species such as the giant squids (*Architeuthis spp.*) may live for several years. As typical for cephalopods, many squids are semelparous and die shortly after mating.

Since most squids live in the water column and not directly on the bottom, they use different techniques to avoid predation. Besides ejecting ink clouds to confuse predators, most squids use different skin colourations to become less detectable. While shallow water species use a kind of countershading (thus a dark topside colouration while exhibiting a light downside colouration), several deep-sea species produce bioluminescent lights which eliminates their silhouettes against down-welling sunlight.

Squids move by expelling jets of water from their mantle while steering and balancing themselves with their fins. They are voracious, active predators and feed upon crustaceans, fish and other cephalopods. Several squid species are well known to form schools, hunt together and hence interact socially to a high degree.

The size of squids is normally characterised by measuring the corresponding mantle length, as shown in the figure below:



FAO (2010)

SQUIDS (TEUTHIDA)

Alloteuthis media

(Linnaeus, 1758)

Order Myopsida

Family Loliginidae

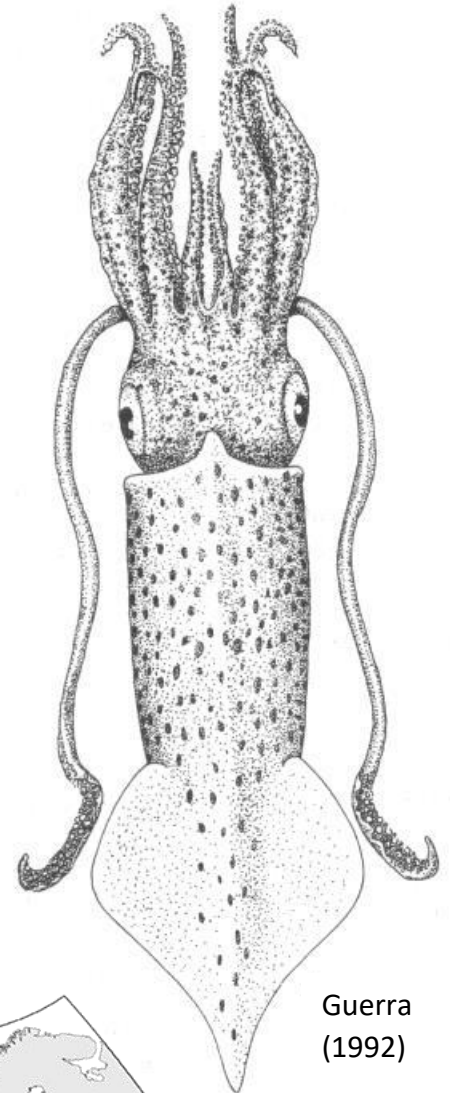
Genus *Alloteuthis*

Common name: Midsize squid, little squid (UK); Casseron bamboo, petit encornet (France); Calamarín menor, Luria (Spain); Calamaretto comune (Italy); Totanitu (Monaco); Καλαμαράκι [kalamaraki] (Greece)

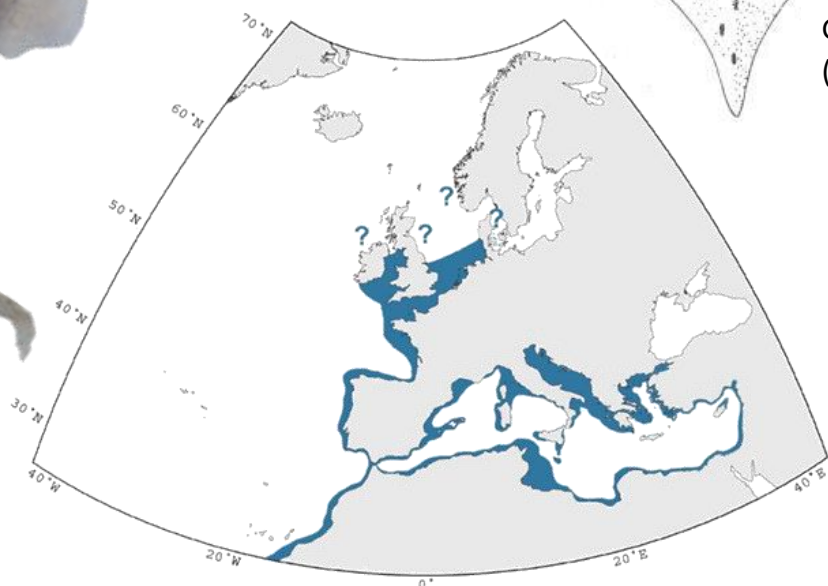
Description: Long, relatively narrow mantle, maximum mantle length 13,2 cm. Pointed, short tail, fins heart-shaped. Long, robust tentacles. Both small and large chromatophores alternate on the mantle surface.

Distribution: North-East Atlantic, from the Irish Sea southwards to the Sahara Bank. In the North Sea, it must be considered as very rare as no recent records are known. Throughout the Mediterranean Sea, *A. media* is a very abundant species and widely distributed.

Habitat: Sandy and muddy grounds between the surface and a depth of 200 m, although also records from depth as deep as 500 m are known. This species can also be found in brackish water. Seasonal migration in shallower waters from March and April on. In late autumn, they return to deeper offshore waters.



ICES (2015)



ICES (2015)

SQUIDS (TEUTHIDA)

Alloteuthis subulata

(Lamarck, 1798)

Order Myopsida

Family Loliginidae

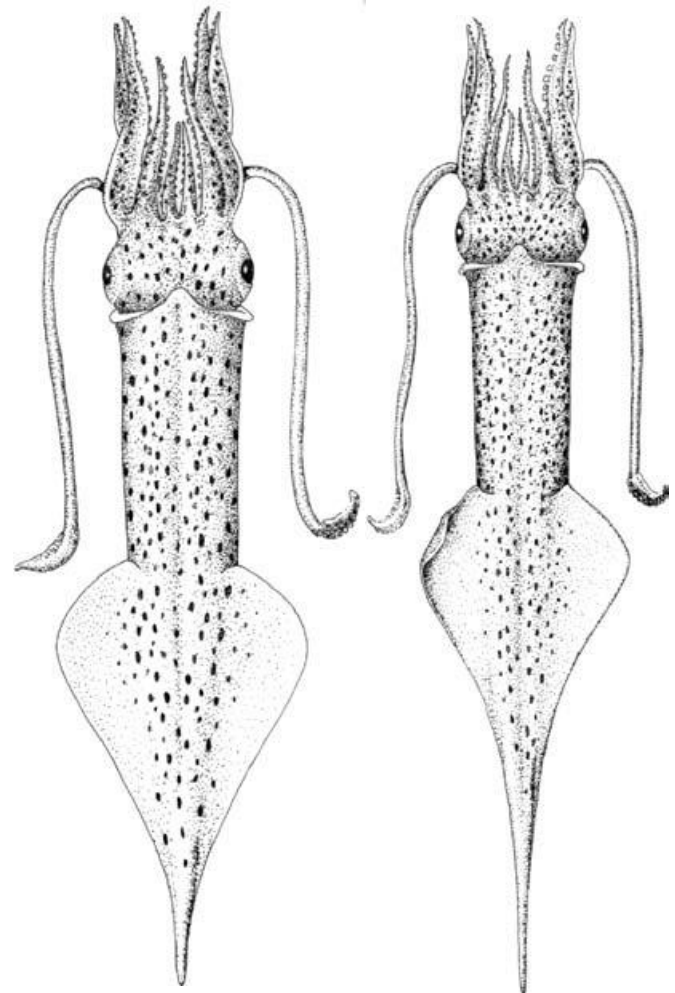
Genus *Alloteuthis*

Common name: European common squid (UK); Casseron commun (France); Calamarín picudo (Spain); Calamaretto puntuto (Italy)

Description: Bullet-shaped body. Long and narrow mantle, maximum mantle length 18,4 cm in males and 14 cm in females. Moderately long tail in females, very long and pointy tail in males. Fins rhombic. Short, delicate tentacles.

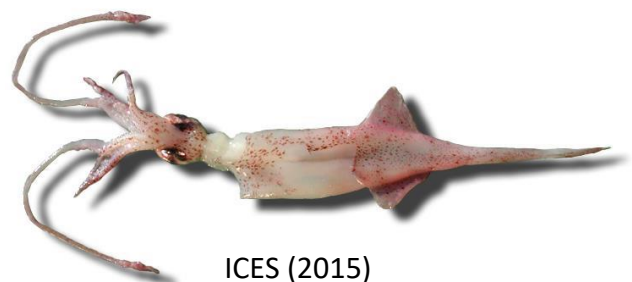
Distribution: North-East Atlantic, from Scottish waters and the south of Norway to the Sahara Bank. It is the most dominant cephalopod species in the North Sea and occasionally enters the Baltic Sea. *A. subulata* can be found in the Mediterranean Sea but is absent from its easternmost parts and the Sea of Marmara.

Habitat: *A. subulata* inhabits sandy and muddy bottoms from shallow coastal areas to a depth of 500 m but is also common on hard substrata. Seasonal migration with mature animals arriving in coastal onshore waters in spring/summer. This species is known to form dense aggregations.

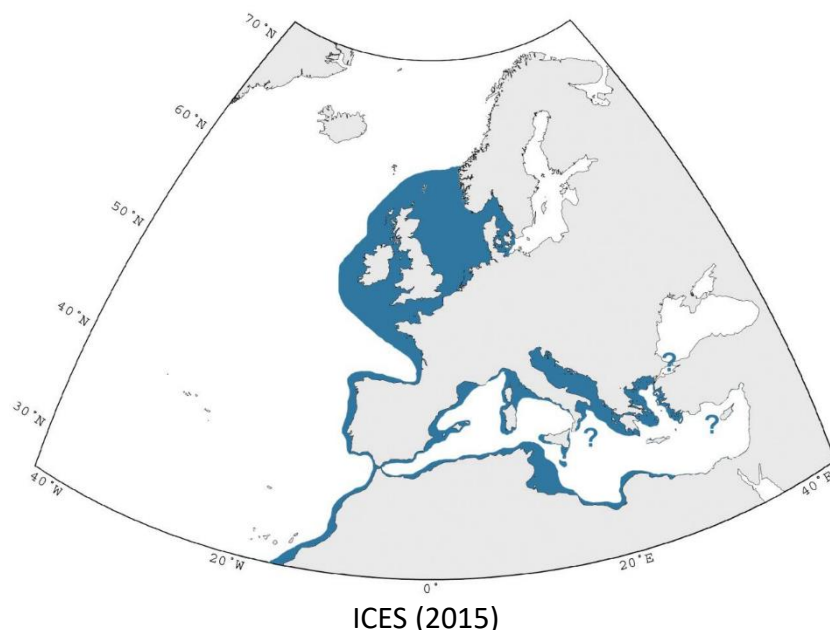


Female
FAO (2010)

Male
FAO (2010)



ICES (2015)



SQUIDS (TEUTHIDA)

Ancistroteuthis lichtensteini

(Férussac, 1835)

Order Oegopsida

Family Onychoteuthidae

Genus *Ancistroteuthis*

Common name: Angel squid (UK); Cornet archangel (France); Luria paloma (Spain); Totano angelo (Italy)

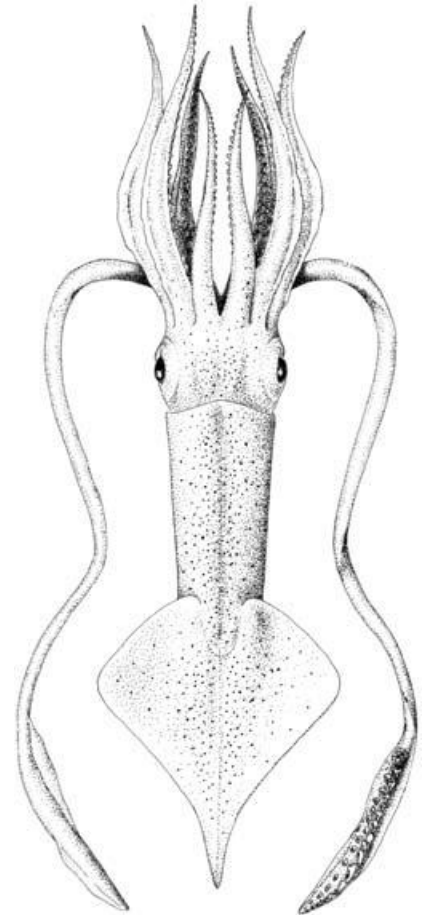
Description: Mantle slender and very muscular, maximum mantle length up to 30 cm. Skin smooth; fins strong.

Distribution: North-East Atlantic, from the northwest of Spain southwards to Angola, as well as the Mediterranean Sea. Occasionally found in the Central- and South-West Atlantic as well as the southwestern Pacific. However, records outside the Mediterranean Sea are very sparse.

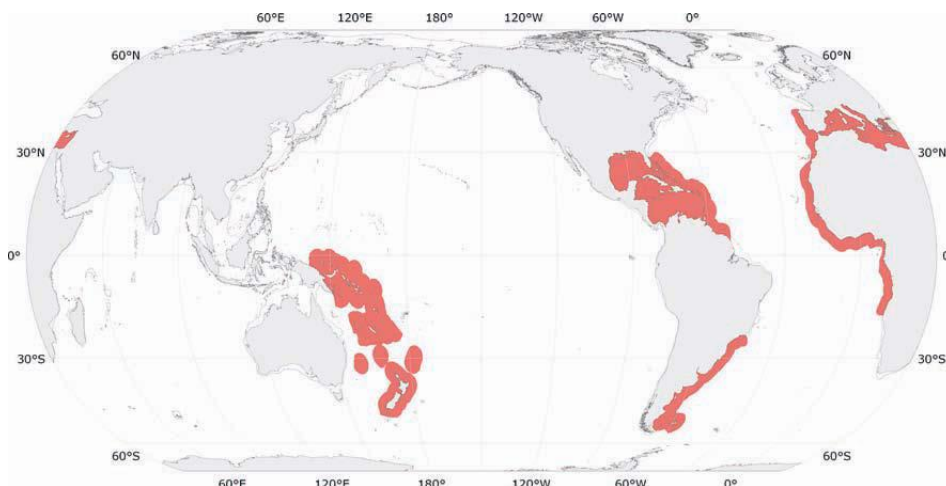
Habitat: The vertical distribution of this species ranges from 0 – 250 meters, although some exemplars have been caught in 1270 m. Typically found on gravel bottoms during spring and summer, especially during spawning in summer.



Image by Richard E. Young (modified)



FAO (2010)



FAO (2010)

SQUIDS (TEUTHIDA)

Illex coindetii

(Vérany, 1839)

Order Oegopsida

Family Ommastrephidae

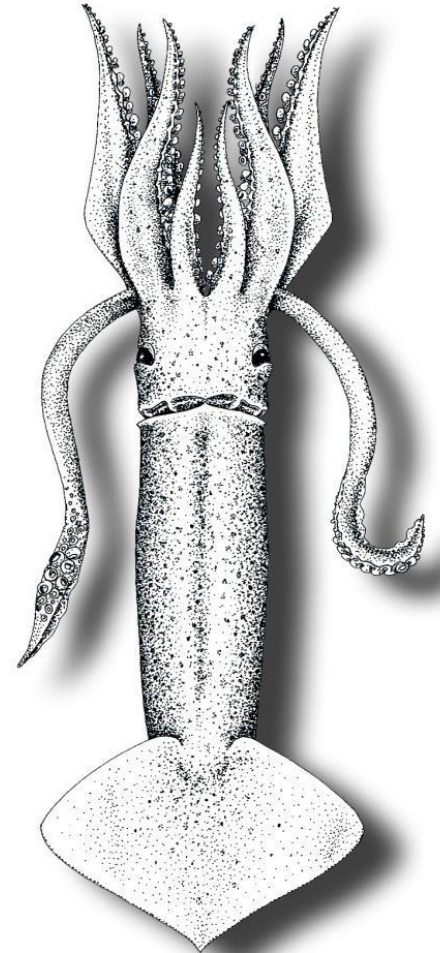
Genus *Illex*

Common name: Broadtail shortfin squid (UK); Encornet rouge, Faux encornet (France); Pota voladora (Spain/Portugal); Totano, Todaro (Italy); θράψαλο [thrapsalo] (Greece)

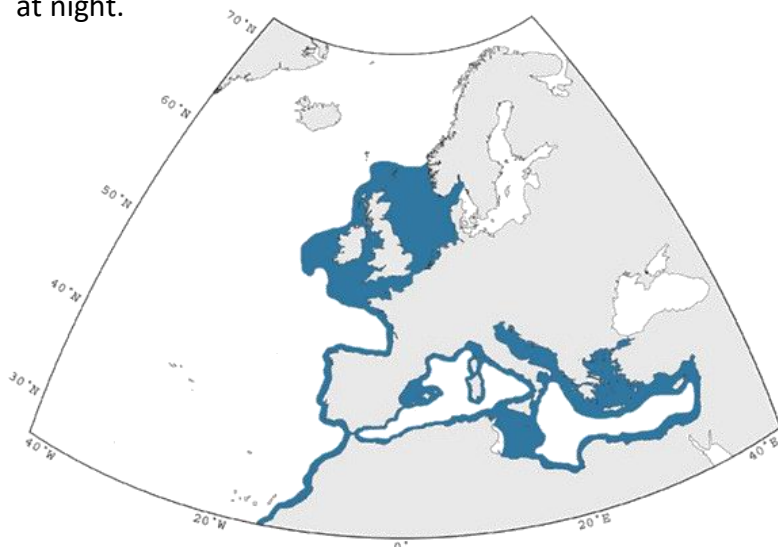
Description: Mantle relatively long and narrow, common mantle length between 20 and 25 cm, but some exemplars up to 37,9 cm (males) and 27,9 cm (females), respectively.

Distribution: This species can be found on both sides of the Atlantic Ocean. Along the American continent, it can be found along the east coast of the United States southwards to the north of Brazil as well as in the Gulf of Mexico and the Caribbean Sea. In the East Atlantic, its distribution ranges from as far north as the Oslo Fjord (Norway) to the coast of Namibia. *I. coindetii* can be found in the North Sea but must be considered as rarely in these waters. Contrariwise, it is very abundant and widely distributed along the French and Iberian Atlantic coast as well as in the Mediterranean Sea.

Habitat: Muddy, sandy and debris-rich bottoms, often covered by sea pens of the genus *Funiculina*. This species has been observed from surface waters down to 1000 m, although it is commonly found between 50 and 400-600 meters, depending on the geographic area. Adult animals undergo a vertical migration from deeper waters to the upper water layer at night.



Guerra (1992)



ICES (2015)



ICES (2015)

SQUIDS (TEUTHIDA)

Loligo forbesii (Steenstrup, 1856)

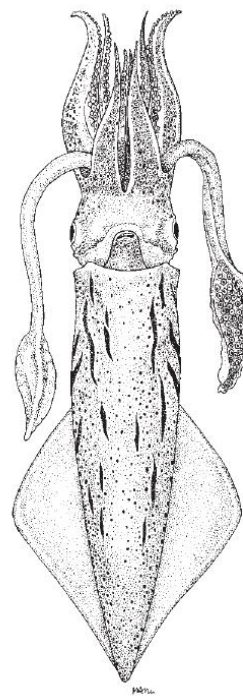
Order Myopsida
Family Loliginidae
Genus Loligo

Common name: Veined squid, Forbe's squid (UK); Encornet veiné, Encornet de Forbes (France); Calamar veteadado, Calamar de Forbes (Spain); Calamaro venato, Occhione (Italy); Nordischer Kalmar (Germany); Dlinnoperiy Kalmar (Russia); Lula, Lula riscada (Portugal); Noordse pijlinktvis (the Netherlands); Καλαμάρι [calamary] (Greece)

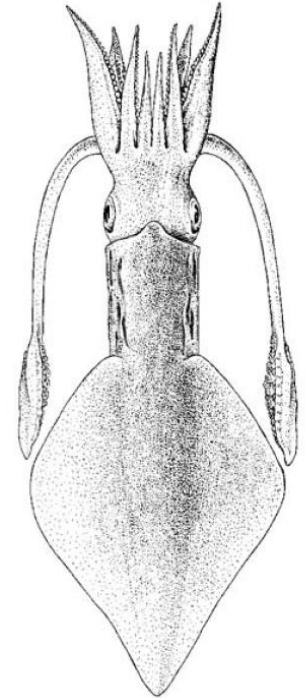
Description: Mantle long and moderately slender, maximum mantle length up to 93,7 cm (males) and 46,2 cm (females), respectively, for exemplars from the Atlantic. In the Mediterranean Sea, common mantle length between 20 and 30 cm. Maximum body weight up to 8,3 kg. Fins rhomboidal. The mantle commonly has longitudinal, flame-like stripes of dark chromatophores on its surface.

Distribution: North-East Atlantic, from the Faroe Islands southwards to the west coast of Africa, although the exact southern limit of distribution remains unknown. *L. forbesii* can also be found around the Atlantic Islands of the Azores, Madeira and the Canaries and is furthermore distributed throughout the Mediterranean Sea.

Habitat: This species occurs commonly in waters 50 – 250 m deep but has also been recorded in waters as shallow as 15 m and as deep as 1000 m, depending on the geographical location. In areas where its distribution overlaps with *L. vulgaris*, *L. forbesii* tends to occur in deeper regions. Seasonal migrations have been observed but vary highly based on the geographical region and are poorly understood up to the present.



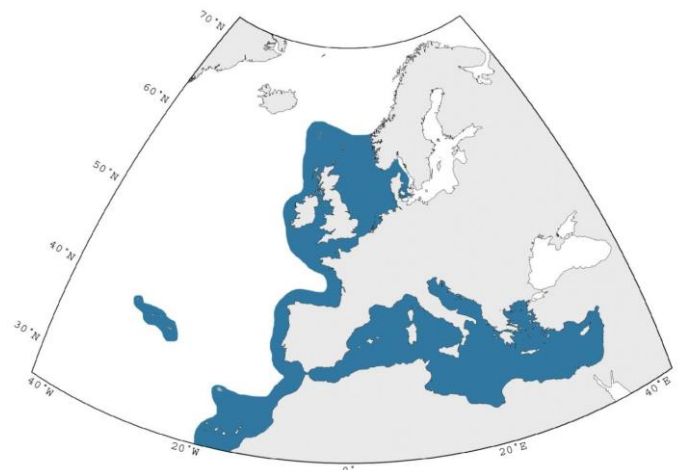
Ventral view
FAO (2010)



Dorsal view
FAO (2010)



ICES (2015)



ICES (2015)

SQUIDS (TEUTHIDA)

Loligo vulgaris

(Lamarck, 1798)

Order Myopsida

Family Loliginidae

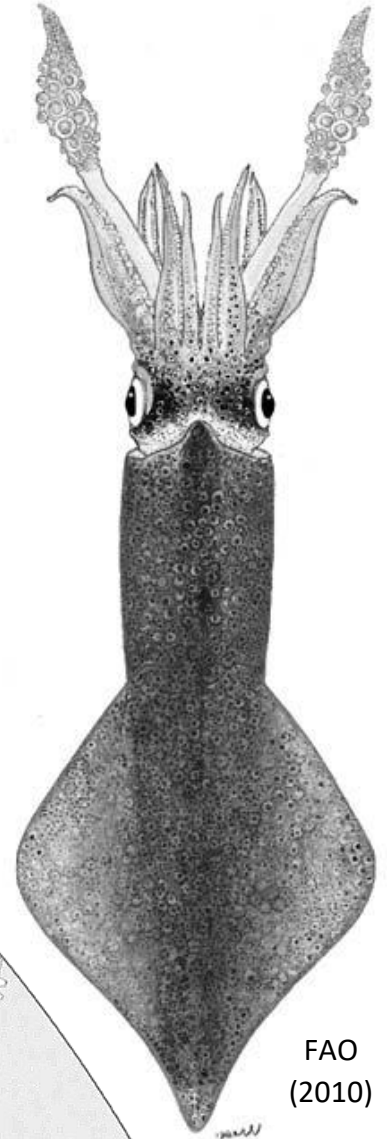
Genus Loligo

Common name: European squid (UK); Encornet européenne (France); Calamar europeo/común (Spain); Calamaro mediterraneo/comune (Italy); Gemeiner Kalmar (Germany); Kalmar (Algeria/Bulgaria/Turkey/Russia); Καλαμάρι [calamary] (Greece); Sobbeit Totanu (Egypt); Habbar (Libya); Kalamar (Malta); Mettik (Tunisia)

Description: Mantle long and relatively slender, maximum mantle length up to 64 cm (males) and 48,5 cm (females), respectively. Maximum body weight 2,3 kg. Fins rhombic, their length up to two-thirds of mantle length.

Distribution: North-East Atlantic, including the southern North Sea (and occasionally the Baltic Sea), southwards to the west African coast around Senegal and Angola. Moreover, very abundant in the Mediterranean Sea.

Habitat: This species has a depth range from the surface to 200 – 500 m and mostly occurs near coasts with abruptly sloping bottoms. *L. vulgaris* prefers coarse sand bottoms but can also be found over other different textures of sediment and even in seagrass meadows. Both daily vertical migrations to detect prey and seasonal migrations to onshore waters during the summer months for reproduction are known.



FAO
(2010)



Image by Hans Hillewaert (modified)



ICES (2015)

SQUIDS (TEUTHIDA)

Ommastrephes bartramii

(Lesueur, 1821)

Order Oegopsida

Family Ommastrephidae

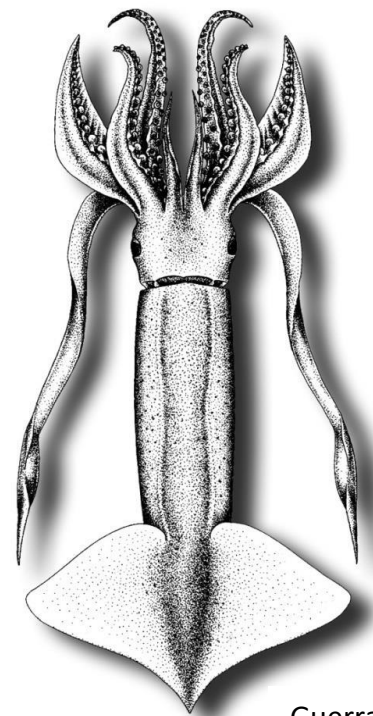
Genus *Ommastrephes*

Common name: Neon flying squid, red flying squid (UK); Encornet volant, Encornets rouges, Calmars rouges, Encornet carol (France); Pota saltadora (Spain); Pota de orelhas, Pota saltadora (Portugal); Totano nero (Italy); Pfeilkalmar, Flugkalmar (Germany); Kal'mar bartrama (Russia); Θράψαλο [thrapsalo], Καταμάχι [katamachi] (Greece)

Description: In European waters, the maximum mantle length documented up to now is 90 cm for a female with a body weight of 25 kg and 42 cm for a male with a body weight of 2,2 kg.

Distribution: *O. bartramii* has a circumglobal distribution in temperate waters. In the North-East Atlantic, it can be found from Iceland southwards to the West African coast. In the North Sea, it only occurs in the western region, but it is widespread in the Mediterranean Sea.

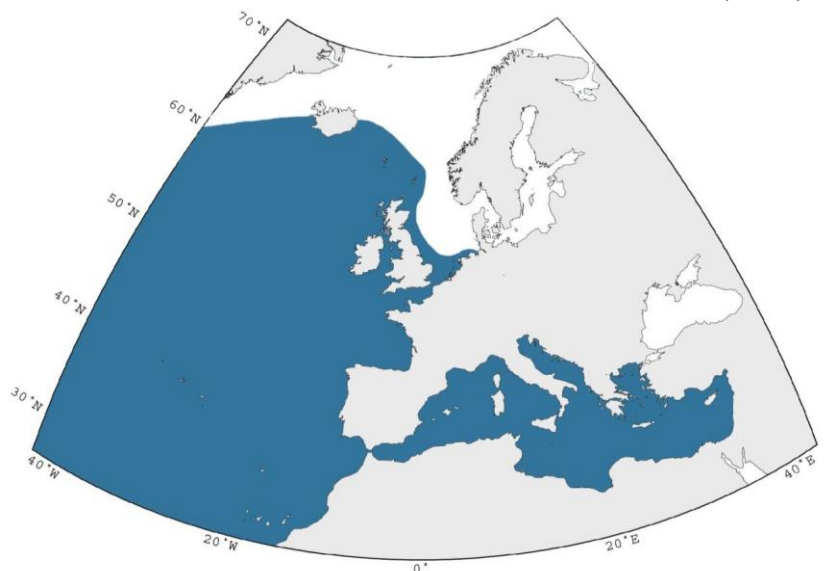
Habitat: While this species usually spends daytime in depth of 300 – 700 m (and may descent to depth of 1490 m), they occur at the surface during the night. Like other *Ommastrephids* (flying squids), they are able to shoot out of the water to avoid predation.



Guerra (1992)



ICES (2015)



ICES (2015)

SQUIDS (TEUTHIDA)

Onychoteuthis banksii

(Leach, 1817)

Order Oegopsida

Family Onychoteuthidae

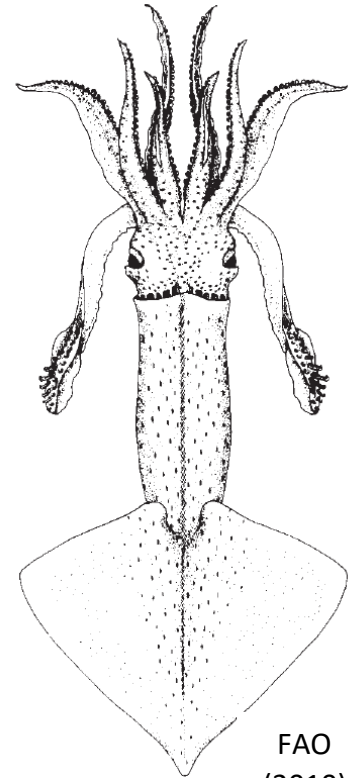
Genus *Onychoteuthis*

Common name: Common clubhook squid (UK); Cornet crochu (France); Luria ganchuda (Spain); Totano dalle unghie (Italy)

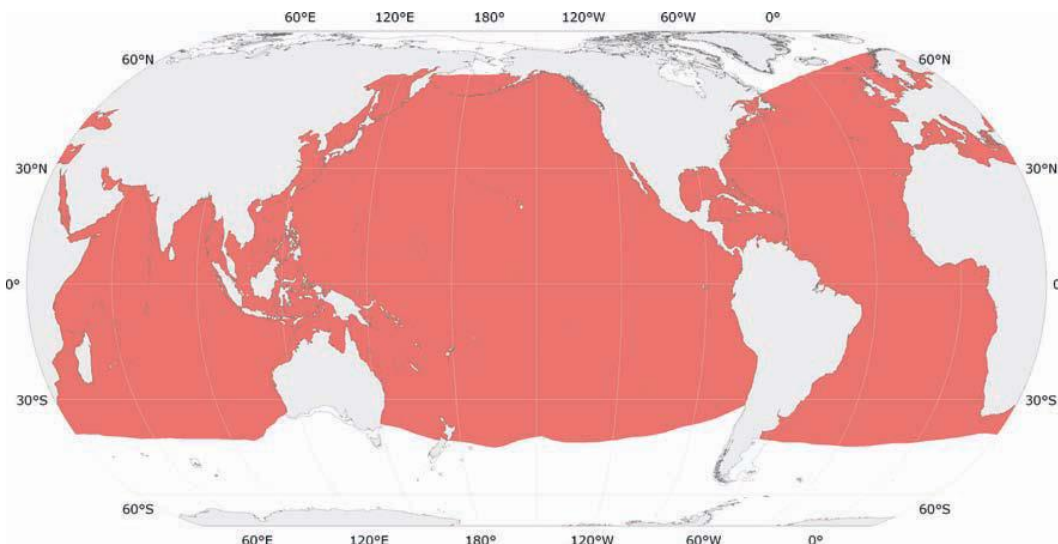
Description: Mantle robust, with a mantle length of up to 30 cm. Several elongate, flap-like folds around the dorsolateral surface of the neck. Fins muscular and rhomboidal. Tail pointed.

Distribution: This species has a cosmopolitan distribution in tropical and temperate waters. In European waters, it occurs in the North-East Atlantic from the north of Norway southwards (including the North Sea and even the Baltic Sea) and can also be found throughout the Mediterranean Sea and the Black Sea.

Habitat: *O. banksia* is an oceanic species with a common depth range of 0 – 150 meters, although it was been documented as deep as 4000 m. Typically found in schools, these cephalopods can be frequently observed 'flying' above the surface to escape predation.



FAO
(2010)



FAO (2010)



Image by
IMARES/Henk Heessen

SQUIDS (TEUTHIDA)

Todaropsis eblanae

(Ball, 1841)

Order Oegopsida

Family Ommastrephidae

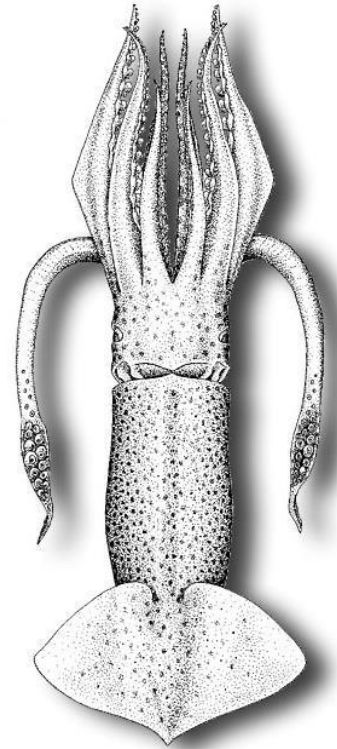
Genus *Todaropsis*

Common name: Lesser flying squid (UK); Toutenon souffleur (France); Pota costera (Spain); Pota costeira (Portugal); Totano tozzo (Italy); Θράψαλο [thrapsalo] (Greece)

Description: Mantle robust, with a maximum mantle length of 29 cm for females and 22 cm for males. Fins broad, fin length less than 50 % of mantle length.

Distribution: This species exhibits a broad distribution and can be found in the North-Eastern Atlantic and Mediterranean Sea as well as in West Indian Ocean, West Pacific Ocean and eastern and northwestern Australian waters. In the North-East Atlantic, it occurs from the Arctic Norwegian waters southwards to the African coast, including the North Sea, Skagerrak and Kattegat.

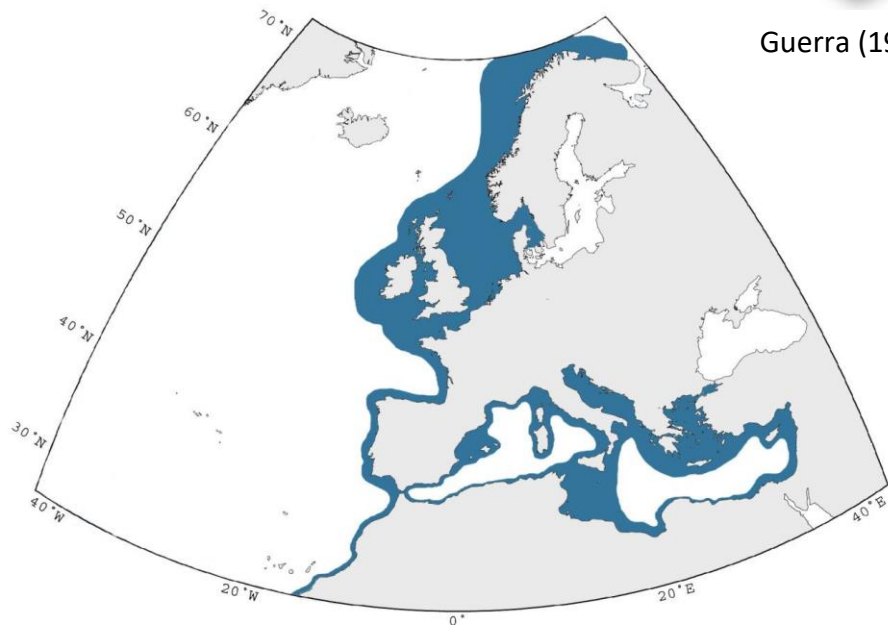
Habitat: *T. eblanae* prefers sandy and muddy bottoms in depths between 20 and 850 m, although being restricted to depths less than 200 m in the North Sea. No clear evidence of either seasonal or daily vertical migration exists.



Guerra (1992)



ICES (2015)



ICES (2015)

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