Portuguese Man-of-War

Physalia physalis

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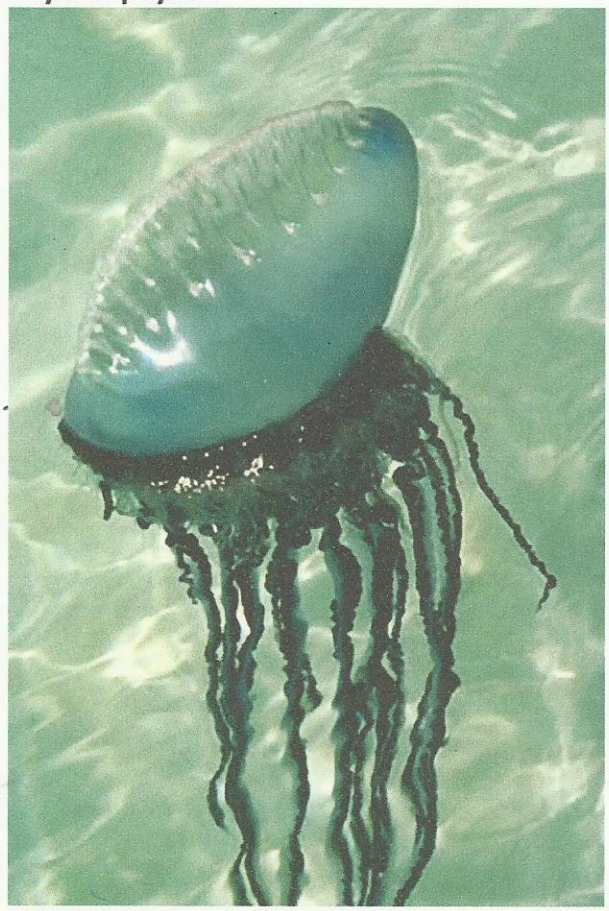
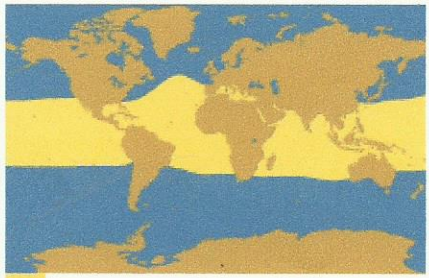


A Portuguese man-of-war
Photograph by O.S.F./Animals Animals—Earth Scenes



Portuguese Man-of-War range

Fast Facts

Type: Invertebrate
Diet: Carnivore
Size: Float, 12 in (30 cm) long, 5 in (12.7 cm) wide; Tentacles, Up to 165 ft (50 m) long
Did you know? The tiny *Nomeus gronovii* fish is immune to the sting of the Portuguese man-of-war. It lives among the tentacles and even snacks on the stinging tendrils.

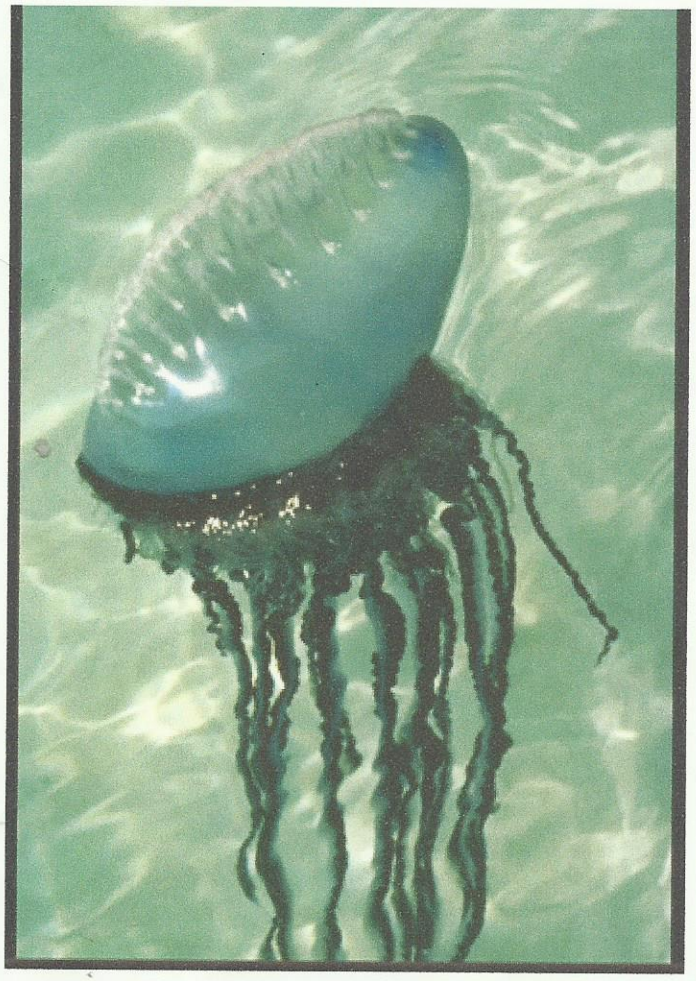
Anyone unfamiliar with the biology of the venomous Portuguese man-of-war would likely mistake it for a jellyfish. Not only is it not a jellyfish, it's not even an "it," but a "they." The Portuguese man-of-war is a siphonophore, an animal made up of a colony of organisms working together.

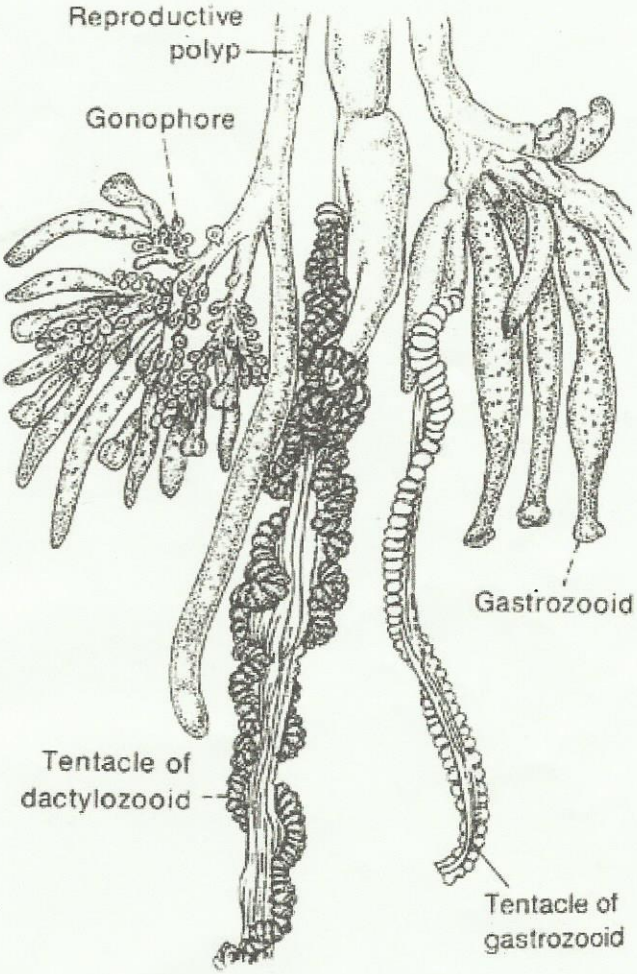
The man-of-war comprises four separate polyps. It gets its name from the uppermost polyp, a gas-filled bladder, or pneumatophore, which sits above the water and somewhat resembles an old warship at full sail. Man-of-wars are also known as bluebottles for the purple-blue color of their pneumatophores.

The tentacles are the man-of-war's second organism. These long, thin tendrils can extend 165 feet (50 meters) in length below the surface, although 30 feet (10 meters) is more the average. They are covered in venom-filled nematocysts used to paralyze and kill fish and other small creatures. For humans, a man-of-war sting is excruciatingly painful, but rarely deadly. But beware—even dead man-of-wars washed up on shore can deliver a sting.

Muscles in the tentacles draw prey up to a polyp containing the gastrozooids or digestive organisms. A fourth polyp contains the reproductive organisms.

Man-of-wars are found, sometimes in groups of 1,000 or more, floating in warm waters throughout the world's oceans. They have no independent means of propulsion and either drift on the currents or catch the wind with their pneumatophores. To avoid threats on the surface, they can deflate their air bags and briefly submerge.





The Portuguese Man-of-War (called the Bluebottle in Australia) is a floating colony of animals that lives in warm seas. This poisonous animal is called the Man-of-War because it looks a bit like a Portuguese battleship with a sail. The Man-of-War is eaten by many animals, including sea turtles.

A small fish (*Nomeus gronovii*, 8 cm long) is mostly immune to the Man-of-War's poison and lives protected (from other predators) among the tentacles. This fish eats the tentacles (which are regenerated), but sometimes the fish is eaten by the Man-of-War.

Diet: The Portuguese Man-of-War eats small fish and other small ocean animals that is stings with its long tentacles. The poison in the stingers paralyzes the prey, which the Man-of-War then eats. The poison cannot kill humans, but the sting can be very painful.

Anatomy: The Man-of-War floats on a gas-filled, blue to pink, translucent body called a pneumatophore (belonging to a single animal). The body is 3 to 12 inches (9-30 cm) long. The crest (only a few inches tall) above the float acts like a sail, moving the animal across the seas. Polyps support the tentacles and are located under the float; there are 3 types of polyps: dactylozooid (that find and catch prey with poisonous stingers called nematocysts), gonozooid (that reproduce), and gastrozooid (that digest the food, like a stomach). The coiled, stinging tentacles can be up to 165 feet (50 m) long.

Classification: Phylum Cnidaria (corals, jellyfish, sea anemones, hydrozoans), Class Hydrozoa, Order Siphonophora, Genus Physalia.

Ctenophora Eschscholtz 1829 Taxonomy

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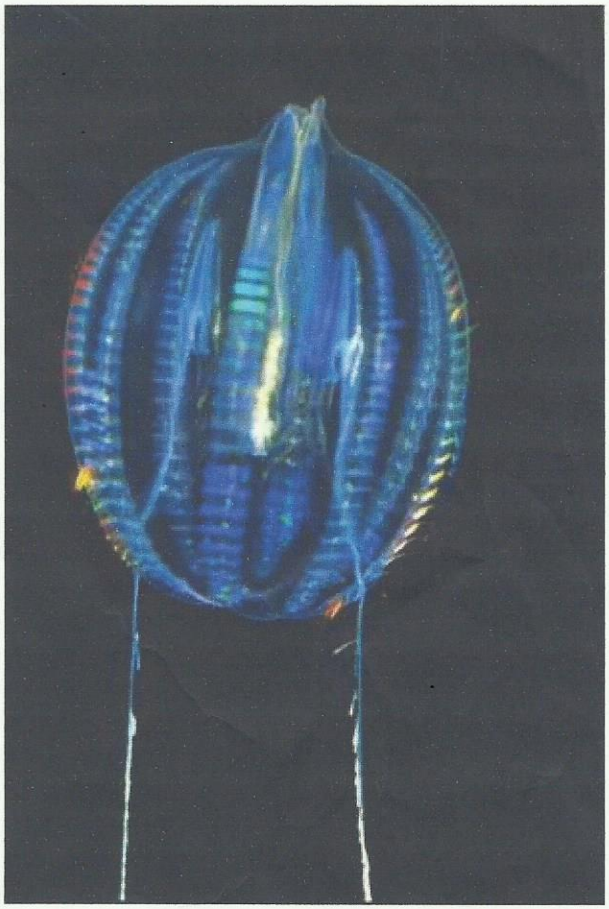
Phylum ~~Ctephophora~~ Ctenophora



Size

- Vary in size from about 20 mm to 150 mm.

Description

- Gelatinous, mostly holoplanktonic animals commonly called sea gooseberries or comb jellies.

Distinguishing characteristics

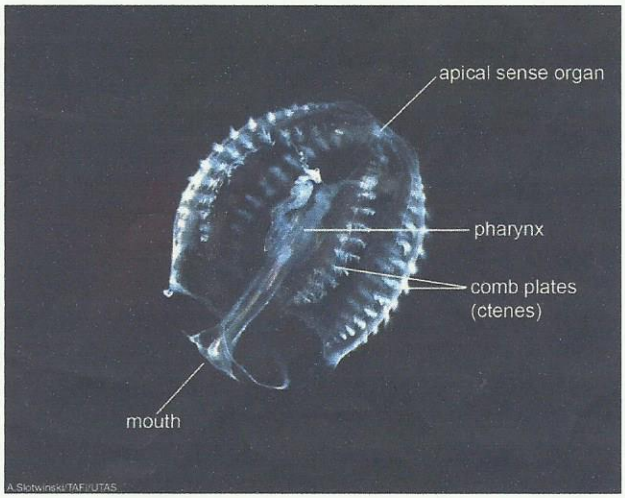
- They swim by means of 8 rows of combs consisting of many fused cilia (hairlike extensions of cell membranes).
- These so-called combs or ctene plates are characteristic and give the phylum its name. Because of their structure they refract light, producing beautiful iridescent displays of colour as the animal swims.
- Body shape ranges from spherical to ribbon-like, and there is usually a pair of tentacles armed with sticky cells used to capture prey.
- Body has biradial symmetry. One central plane passes through both tentacle pouches, and another plane at a right angle to this, passes through the mouth slit.
- Body plan is similar to that of the Cnidarians. In fact they were included in the same phylum at one time, but they lack stinging cells, there is no alternation of generations in the life cycle and ctenophores are never colonial.

Distribution

- Worldwide.
- Most abundant in coastal areas.
- Up to depths of 4 km.

Ecology

- All ctenophores are carnivorous.
- Hermaphroditic.
- Spawning occurs in the water column.
- Unique early development characterized by blastomeres. Bisymmetry of adults is established in the early 4-cell stage (Larink and Westheide 2006).



Additional notes

- Comb-jellies can occasionally occur in concentrations dense enough to completely clog plankton nets.
- They are quite fragile and difficult to preserve intact.

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A nice drawing of several species of Ctenophores

Common jellyfish (*Aurelia aurita*)

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Facts

Also known as: Moon jellyfish, moon jelly
Kingdom Animalia
Phylum Cnidaria
Class Scyphozoa
Order Semaeostomeae
Family Ulmaridae
Genus *Aurelia (1)*
Size Diameter: up to 250 mm (2)

Status

Common and widespread (2).

Description

This is the most common jellyfish on British shores (2). The body is a saucer shaped 'bell', which is colourless except for 4 obvious violet gonads visible in the centre of the disc (2). The outer edges are fringed with many small tentacles, and four stocky 'arms' surround the mouth (2).

Range

Found around all British coasts (2). It is a northern hemisphere species, found in the Atlantic, Pacific, and Indian Oceans (3).

Habitat

Typically found close to the coast, this jellyfish can also be found in estuaries (2).

Biology

The common jellyfish is carnivorous, and feeds mainly on a variety of **planktonic** species such as molluscs, crustaceans, young worms and copepods (3). The plankton is caught in a layer of mucus that covers the jellyfish. Tiny hair-like structures called 'cilia' on the body of the jellyfish produce currents by beating. These currents transport the captured plankton towards the edge of the 'bell', where it is removed with the arms and passed to the mouth (2). The tentacles around the margins of the bell and the arms bear stinging cells, which are occasionally used to catch small fishes and other prey (2).

The sexes are separate and fertilisation occurs internally; the sperm is taken into the female's body via the mouth (2). The fertilised eggs undergo development in pockets in the arms that surround the mouth. The free-swimming **larvae** (known as 'planulae' larvae) are released during autumn; after some time these larvae settle and develop into tiny sessile animals ('scyphistomae'), which reproduce **asexually** and release free-swimming tiny immature jellyfish (called 'ephyrae'), which feed on plankton and become mature after around 3 months (2).

Threats

Not currently threatened.

Conservation

No conservation action has been targeted at this species.

Glossary

- **Asexually:** of asexual reproduction: reproduction that does not involve the formation of sex cells ('gametes'). In many species, asexual reproduction can occur by fission (or in plants 'vegetative reproduction'); part of the organism breaks away and develops into a separate individual. Some animals, including vertebrates can develop from unfertilised eggs, this process, known as parthenogenesis gives rise to offspring that are genetically identical to the parent.
- **Larvae:** stage in an animal's lifecycle after it hatches from the egg. Larvae are typically very different in appearance to adults; they are able to feed and move around but usually are unable to reproduce.
- **Planktonic:** aquatic organisms that drift with water movements; may be either phytoplankton (plants), or zooplankton (animals).

Introduction to Cubozoa:

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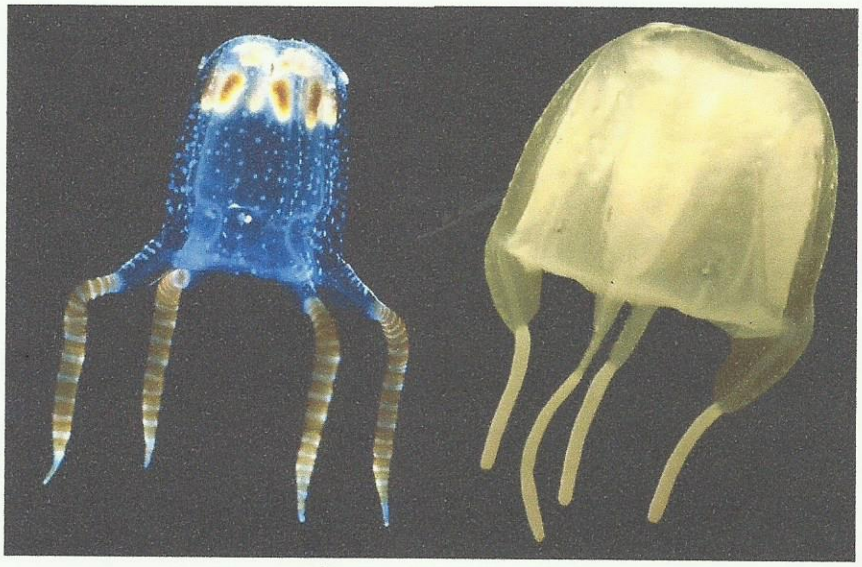
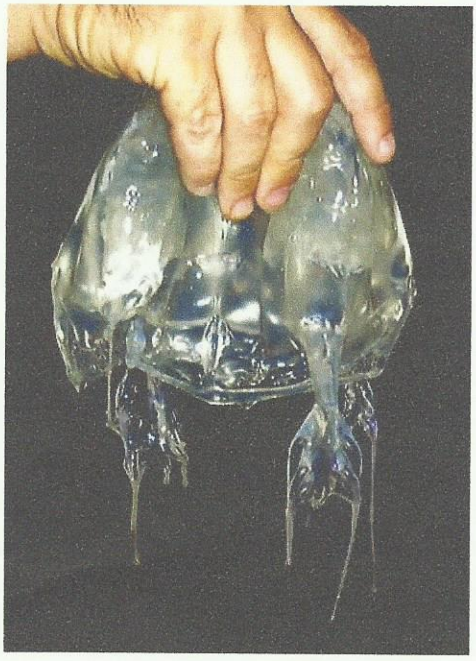


The Box Jellies!

Cubozoans are marvelous animals.

They look like your basic jellyfish, but they can swim pretty fast, maneuver around things, and see fairly well despite not having a brain. Believe it or not.

In general, box jellies are similar in form to the "true" jellyfish, known as scyphozoans. However, it is relatively easy to tell the two groups apart. Cubozoans have a square shape when viewed from above. (Gee, maybe that's how they got their name.) They also have four evenly spaced out tentacles or bunches of tentacles and well-developed eyes. Not surprisingly, given their squishy nature, there are not many fossil cubozoans known. Today, there are about 20 known species found in tropical and semitropical waters. The Australian stinger *Chironex fleckeri* is among the deadliest creatures in the world, having caused human fatalities.



Be careful handling this critter from Northern Australia! *Chironex fleckeri* grows to about the size of a human head, and has tentacles up to three meters long. A big sting from this guy can easily kill a human, with death occurring in as little as three minutes. There have been roughly 100 deaths due to *Chironex* stings during the past 100 years in northern Australia. However, many people have been stung and not been killed. It is likely that these cubozoans swim away when they come into contact with something as large as a human. According to Phil Alderslade, contact with six to eight meters of tentacle is necessary to deliver enough venom to kill a person. The bell of *Chironex fleckeri* does not have nematocysts. Fortunately, these box jellies are in the business of catching and eating fish and crustaceans.

Chironex individuals do not inhabit reef environments. Instead, the only polyps that have ever been observed in nature were living attached to the undersides of stones in an estuary of a river in northern Australia. The polyps metamorphose into juvenile medusae beginning in the austral spring (September) and continuing until the first large summer rains (usually in January). Medusae are then flushed out into the near shore waters.

The box jellyfish's venom is among the most deadly in the world, containing toxins that attack the heart, nervous system, and skin cells.

Fast Facts

Type:
Invertebrate

Diet:
Carnivore

Average life span in the wild:
Less than 1 year

Size:
10 ft (3 m) long; 10 in (25 cm) across

Weight:
Up to 4.4 lbs (2 kg)

Did you know?
Sea turtles are unaffected by the sting of the box jellyfish and regularly eat them.

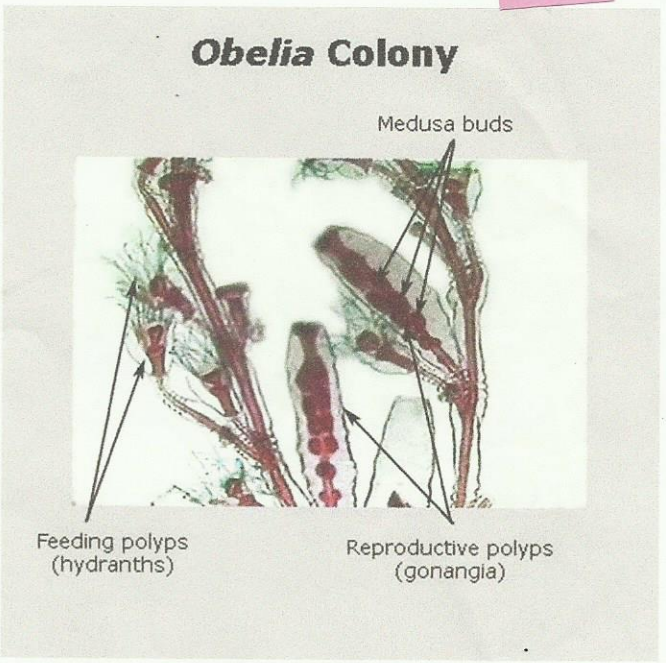
The infamous box jellyfish developed its frighteningly powerful venom to instantly stun or kill prey, like fish and shrimp, so their struggle to escape wouldn't damage its delicate tentacles.

Their venom is considered to be among the most deadly in the world, containing toxins that attack the heart, nervous system, and skin cells. It is so overpoweringly painful, human victims have been known to go into shock and drown or die of heart failure before even reaching shore. Survivors can experience considerable pain for weeks and often have significant scarring where the tentacles made contact.

Box jellies, also called sea wasps and marine stingers, live primarily in coastal waters off Northern Australia and throughout the Indo-Pacific. They are pale blue and transparent in color and get their name from the cube-like shape of their bell. Up to 15 tentacles grow from each corner of the bell and can reach 10 feet (3 meters) in length. Each tentacle has about 5,000 stinging cells, which are triggered not by touch but by the presence of a chemical on the outer layer of its prey.

Box jellies are highly advanced among jellyfish. They have developed the ability to move rather than just drift, jetting at up to four knots through the water. They also have eyes grouped in clusters of six on the four sides of their bell. Each cluster includes a pair of eyes with a sophisticated lens, retina, iris and cornea, although without a central nervous system, scientists aren't sure how they process what they see.

The Hydra



Found on plants and inert substrata, from within rock pools in the intertidal down to over 30 m in the subtidal. Colonies appear like featherlike projections from the surface to which they attach. Largest reported colonies can reach 350 mm in length, although more usually are 200 mm. Colony is typically single stemmed, with many long branches running off the main stem of similar length. The stem is brown-black in colour and may be forked in longer lived colonies.

Environment and Habitat

- Attach to algae and hard substrates found in the subtidal.
- High intolerance of substratum loss, desiccation and increase in temperature.
- Intermediate intolerance of changes in water flow, smothering, decreases in salinity, abrasion and decreases in wave exposure.
- Low intolerance of changes in oxygen, **turbidity** and increases in salinity.

Reproduction

- Reproduction type: Budding, separate sexes, vegetative.
- Reproduction frequency: Annual.
- Age at maturity: Variable with change between **sessile** hydroid and free-living medusoid stages in life cycle.
- Fecundity: 10,000 - 100,000 eggs per individual.
- Development: Planktonic.
- Larval **settlement** time: Variable with life cycle change from **sessile** to free living. Medusoid stage lasts 7 - 30 days and the planula larvae last 5 - 21 days.
- Dispersal potential: > 10 km.
- Life span: Variable, potential to be very long lived.

Communities

- Forms lines or groups of raised feather like colonies.

Equipment

- Found on other biofouling organisms.
- Stock species particularly shellfish.
- Fishnets, cages, pontoons, shellfish trays, tanks, pipes and buoys.

Effects and Impacts

- Can reduce the value of shellfish.
- Can increase the weight equipment and of bivalves shell, interfering with normal biological function.
- Hydroids can compete with stock species for space and resource.
- Increases labour and production costs as a result of cleaning and removal of biofouling.

Distribution

- Common throughout the north east Atlantic and Mediterranean.

The Staurozoans (The Stalked Jellies)

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Lucernariopsis cruxmelitensis. Photograph: Fiona Crouch/marlin.ac.uk

Lucernariopsis cruxmelitensis is the smallest member of a family of species known as stalked jellyfish. Even at its largest, it does not quite reach 1cm in height.

Description

Lucernariopsis cruxmelitensis resembles an upside-down jellyfish, with its translucent bell underneath and tentacles on the top. There are eight webbed arms within the maroon bell, with up to 35 rounded tentacles at the end of each.

The stinging organs of this stalked jellyfish are very distinctive as white spots on the surface of the bell forming the shape of a Maltese cross.

Habitat

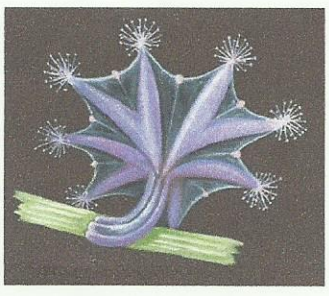
Lucernariopsis cruxmelitensis lives on rocky shores that are exposed to moderately strong waves and currents. It can be found close to the low tide mark or in shallow water. Unlike other stalked jellyfish, it is rarely attached to seagrass but is often found on small, red seaweeds, such as Irish moss.

Ecology

Stalked jellyfish are closely related to anemones, free-floating jellyfish, and corals, all of which have stinging tentacles to paralyse or kill their prey and to protect themselves from predators.

Status

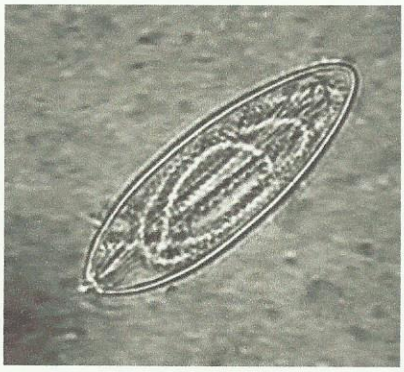
Estimated reduction of population size of 90% from 1970s to 2005. This species was found in often high numbers in south-west England - for example an estimated 2000 where found in one shore search at Wembury in 1969 - but is now rarely seen.



Distribution

The distribution of *Lucernariopsis cruxmelitensis* appears to be limited to the south-west of England, from Swanage to north Devon, and the Atlantic coasts of Ireland.

How does the toxin enter the body?



Venom is delivered by nematocysts (see image at right), which occur primarily on the tentacles, but in some species may be present on the bell (body) as well.

Nematocysts consist of a bulb containing a coiled shaft.

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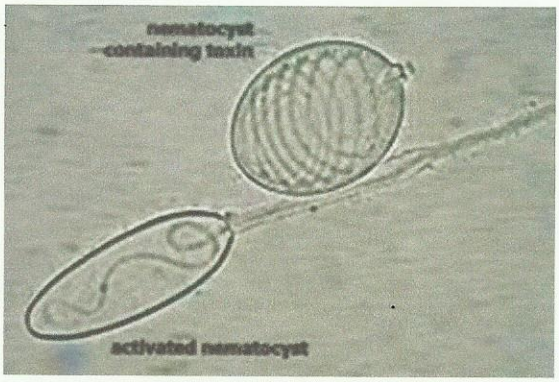
Activation relies on one or more chemical cues or mechanical stimulus to fire. When activated, the spine-covered shaft everts and penetrates the cuticle of the organism being envenomed. Venom flows from the bulb, down the shaft and into the victim.



The image to the right shows two nematocysts. The top cell is intact, with the bulb containing the coiled shaft and toxin. The lower cell has been activated and has fired out the shaft like a hypodermic needle, penetrating the victims flesh and delivering the toxin from the bulb.

Nematocysts are highly specialised structures showing great variety both morphologically and functionally.
These stinging cells not only function as venom injectors but to grapple at the integument of the prey and serve as an adhesion devise. In this way multiple tiny injected doses of venom, applied over a wide area can be achieved, with toxin being injected directly into the blood vessels of the victim.

The image to the right shows a series of fired nematocysts still attached to the tentacle. The vivid blue circles that you can see on the end of the fine threads are drops of venom. The threads themselves are the everted shafts of the nematocysts.
While the variation between the morphology and function of these nematocysts is vast, the underlying mechanisms are the same.

A species of cubozoan may have several types of nematocysts. Together, the complete complement is termed the cnidome. Preliminary research into the cnidomes of different species of cubozoans suggests that they may be species specific. It has also been suggested that these variations reflect differences in the feeding ecology of the animals, with different types of nematocysts in some cnidarians containing different types of venom and being used for vastly different processes during prey capture.

The toxins involved in causing Irukandji syndrome are unknown. At least 20 different types of proteins are present in *Carukia barnesi* venom.