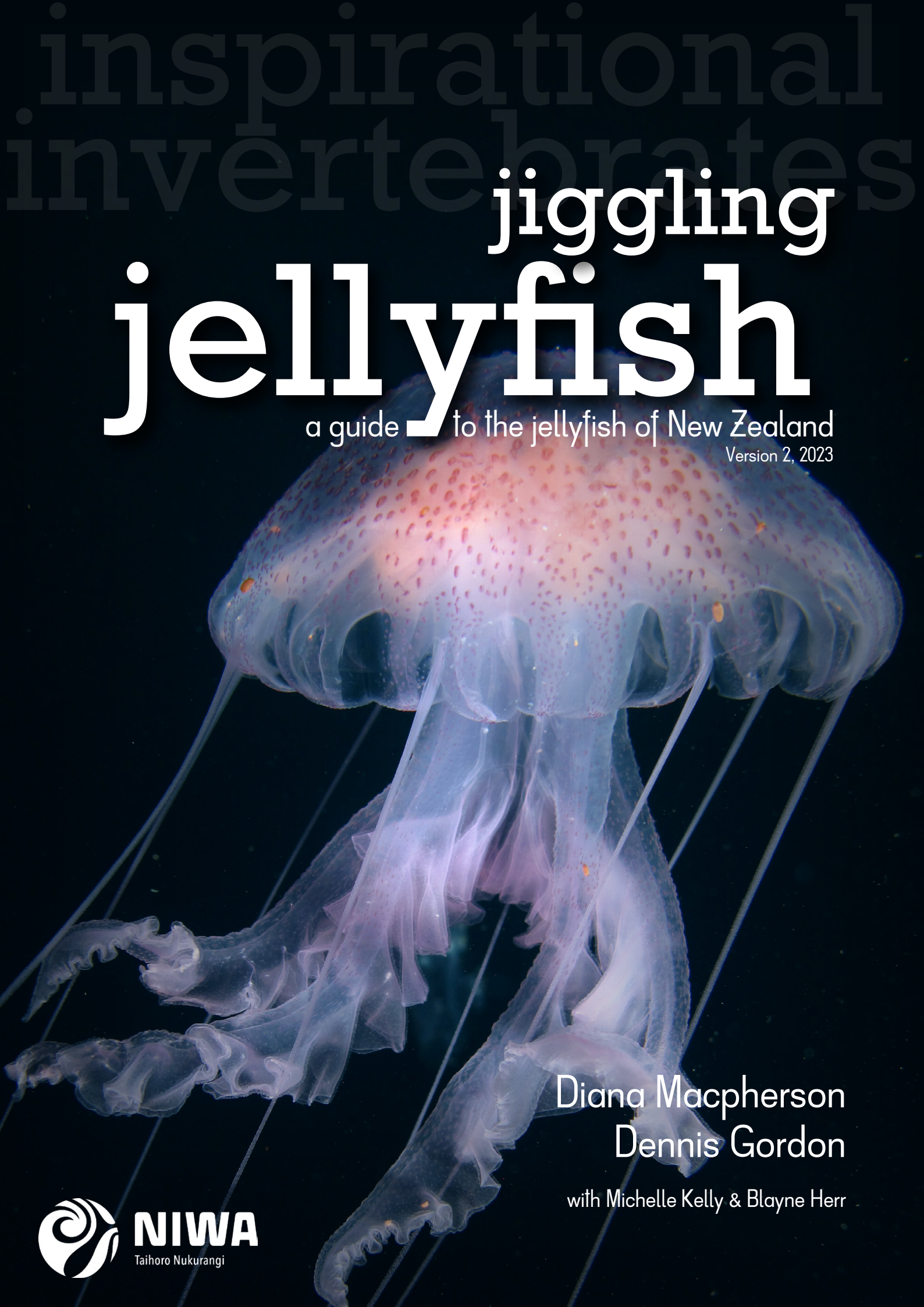
inspirational invertebrates

jiggling jellyfish

a guide to the jellyfish of New Zealand

Version 2, 2023



Diana Macpherson
Dennis Gordon

with Michelle Kelly & Blayne Herr

NIWA
Taihoro Nukurangi

HOW TO TREAT A Jellyfish Sting

Advice from the NZ Ministry of Health

1 Get the person out of the water
and reassure them

2 Act quickly to **flush the stung area** with sea water (or fresh water if sea water is unavailable) to remove the tentacles

DO NOT
PEE ON THE AREA!
This is not a reliable treatment because the pH and chemical makeup of urine is not known

DO NOT
APPLY VINEGAR OR METHYLATED SPIRITS
as they can make the sting more painful

Vinegar is only effective for Australian or tropical box jellyfish.

3 Remove any remaining visible tentacles
using either using your fingers (with gloves if available) or tweezers

4 Immerse the stung area in **heated tap water**
for 15 to 20 minutes to deactivate the venom.

Have it as hot as the person can bear without causing skin burns (and no more than 45°C)

A shower can be used for stings to the torso.

You can repeat the immersion for up to 2 hours after the injury ... but be sure to limit the immersion periods to 15 to 20 minutes at a time with breaks between to allow cooling of the skin

5 Treat discomfort
If necessary, take pain relief such as paracetamol or ibuprofen according to package instructions

Antihistamines may be helpful in relieving itching and swelling

Surf Lifeguards from 75 Surf Life Saving Clubs patrolling 80 locations across New Zealand are trained and equipped to treat jellyfish stings

https://www.health.govt.nz/your-health/conditions-and-treatments/accidents-and-injuries/bites-and-stings/jellyfish-stings#treatblue

about this guide

Jellyfish and other gelatinous planktonic creatures are a stunning and diverse group of marine invertebrates found all over the world's oceans, from the surface coastal waters of every maritime country to the deep sea. The 'true jellyfish' (Class Scyphozoa) are well known, not only because some species sting, but also because of their rhythmic and graceful pulsating movements in the water and their beautiful shapes and colours. We hope you will enjoy reading and using this guide to help identify "Jiggling Jellies" in the wild.

JIGGLING JELLYFISH is a fully illustrated working e-guide to the most commonly encountered jellyfish and other jelly-like species of New Zealand. It is designed for New Zealanders who live near the sea, dive and snorkel, explore our coasts and make a living from it, and for those who educate and are charged with kaitiakitanga, conservation and management of our marine realm. It is one of a series of e-guides on New Zealand marine invertebrates that NIWA's Coasts and Oceans group has recently developed.

The e-guide starts with a simple introduction to living jellies, followed by a morphology (shape) index, species index, detailed individual species pages, and finally, icon explanations and a glossary of terms. As new species are discovered and described, new species pages will be added and an updated version of this e-guide will be made available.

Each species page illustrates and describes features that will enable you to differentiate the species from each other. Species are illustrated with high quality images of the animals in life. As far as possible, we have used characters that can be seen by eye or magnifying glass, and language that is non-technical.

We have added instructions on how to treat a jellyfish sting from the Ministry of Health website, and have included a section on each species page as to it's "sting status".

Outlying island groups, banks, platforms and plateaus are shown on the maps as a two-letter code: Ak = Auckland Islands; An = Antipodes Islands; Bo = Bounty Islands and platform; Ca = Campbell Islands and platform; Ch = Chatham Islands and Chatham Rise; Cp = Challenger Plateau; Ke = Kermadec Islands and the Southern Kermadec Ridge; Pb = Puysegur Bank; Sn = Snares Islands and platform. Information is provided in descriptive text or quick reference icons that convey information without words. Icons are fully explained at the end of this document and a glossary explains unfamiliar terms.

Diana Macpherson is a marine biology technician and assistant collection manager at the NIWA Invertebrate Collection, with interest in jellyfish and hydroid parataxonomy, and collection care.

Dennis P. Gordon is an emeritus biodiversity scientist at NIWA and a distinguished global authority on the biology, paleontology, systematics and evolution of phylum Bryozoa.

For any ID advice on jellyfish you find,
please email your photos to diana.macpherson@niwa.co.nz or dennis.gordon@niwa.co.nz

cataloguing in publication

Macpherson, D., Gordon, D. (2023) Jiggling Jellyfish, a guide to the Jellyfish of New Zealand. Version 2, 29 pp.
https://niwa.co.nz/coasts-and-oceans/marine-identification-guides-and-fact-sheets
Series and managing editor - Michelle Kelly, NIWA
Technical editor - Sadie Mills, NIWA

NIWA
Taihoro Nukurangi

a typical species page layout

taxonomic name of species

taxonomic authority
person(s) who first described this species

common name of species

species classification
see species index for arrangement

depth range
common depth range around New Zealand

information
details on external and internal characters and habitat

key taxonomic references

It could also be ...
some species are difficult to tell apart without more detailed information, so check the other species in the guide listed here to make sure that you have the correct species

species images
inset images show variations and/or closeup detail

body plan icon
highlighting the basic shape, or a special characteristic, that defines a group of these organisms

life history icon
highlighting geographic distribution and other life characteristics

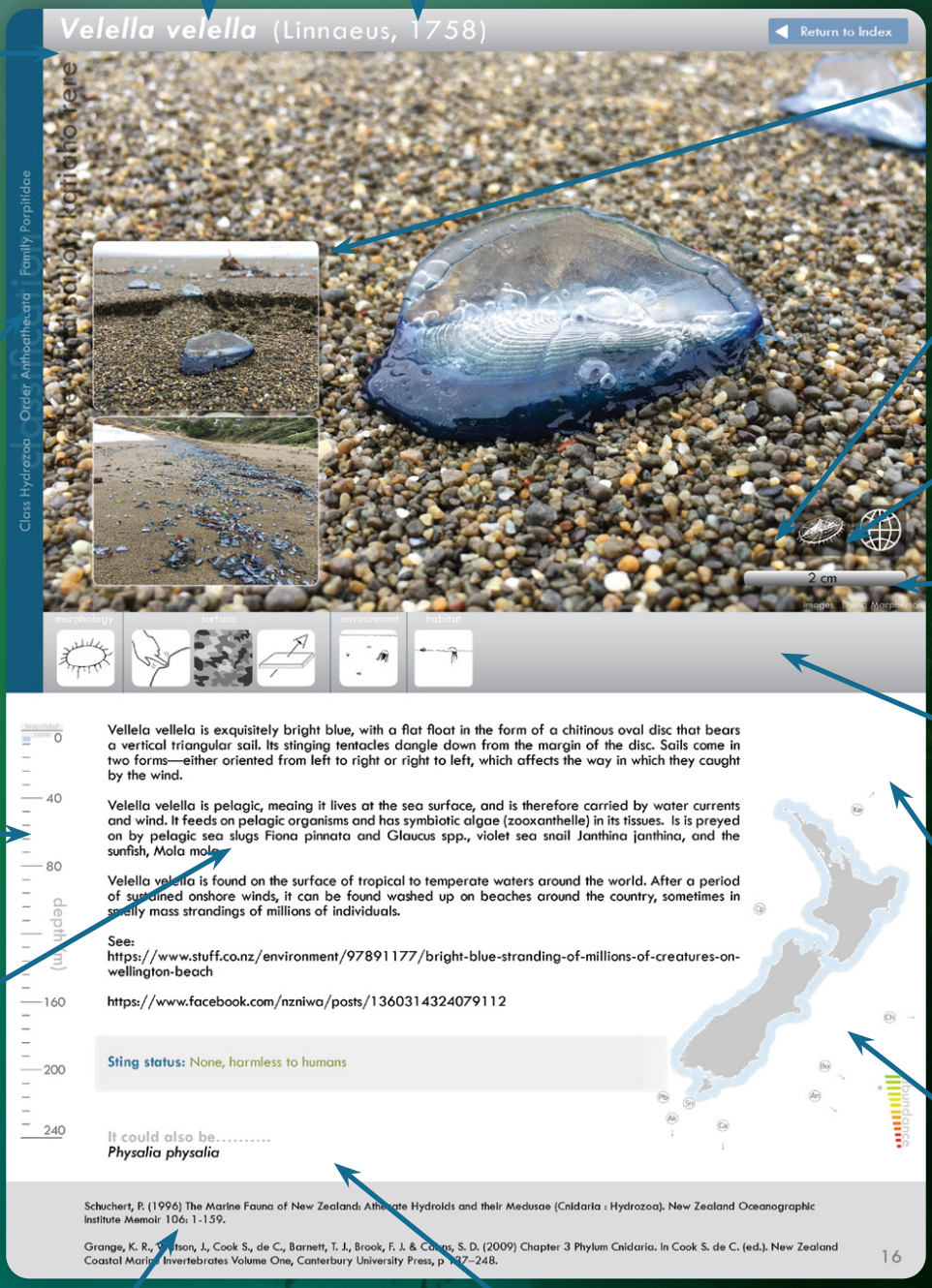
typical size bar
indicating typical size of the organism

quick id icons
highlighting morphology, surface, substrate and habitat

scale of abundance
around New Zealand

distribution
section of coastline where species is most commonly found

make notes of where you encountered this species and let us know if you find it at a new location



JELLYFISH

STALKED JELLIES, BOX JELLIES, TRUE JELLIES, HYDROMEDUSA

Gelatinous animal plankton, for which we use the general term 'jellies' or 'jellyfish', encompasses a diverse range of creatures in the open ocean (and some freshwater lakes), including jellyfish, comb jellies and salps. The most familiar are jellyfish, which are commonly found in any nearshore environment throughout the world. They can be seen washed ashore on beaches by strong onshore winds and storm surge, drifting in coastal currents, or just bobbing along near the sea surface on a calm day.

Blooms of jellies commonly occur in the summer when the water temperature is at its warmest and when there is plenty of food available. In spring, increasing daylength, light intensity and temperature lead to blooms of microscopic plant plankton (phytoplankton), which attracts larger animal plankton (zooplankton) that feed on it, in turn providing food for zooplankton predators like jellies. Some jellies at or near the sea surface can end up being completely controlled by prevailing winds and currents that can gather them into a dense group and strand them on beaches. Being often abundant, jellies play an important role in marine food webs as predators, or prey, or as decomposing scraps of food for suspension feeders in the water or on the seafloor, where bacteria finally process the products of decay.

jellyfish stings

Stinging is caused by the simultaneous discharge of thousands of microscopic stinging capsules called nematocysts, located on the surface of the tentacles and, in some species, the body as well. Upon contact, the nematocysts discharge their mini-harpoons, loaded with venom, into the victim's skin.

There are many different types of jellyfish in New Zealand and not all of them sting, however, treatment of stings is exactly the same regardless of the type of jellyfish involved.

Most stings in New Zealand waters are not serious and current advice for the treatment of jellyfish stings can be found on the Ministry of Health website: https://www.health.govt.nz/your-health/conditions-and-treatments/accidents-and-injuries/bites-and-stings/jellyfish-stings#treatblue

Surf Lifeguards from 75 Surf Life Saving Clubs patrolling 80 locations across New Zealand are trained and equipped to treat jellyfish stings.

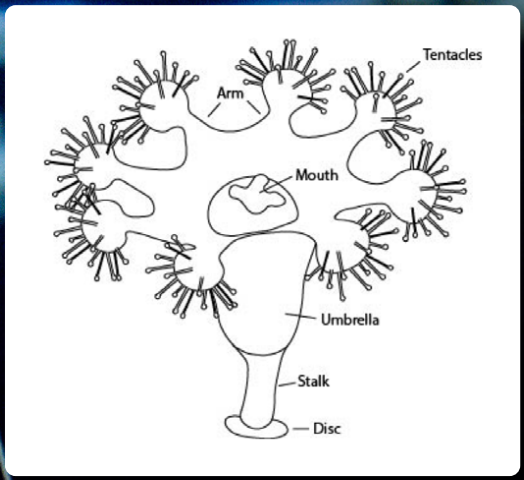
The term jellyfish is used broadly and groups together a wide and fascinating range of gelatinous creatures. The next few pages will describe and differentiate the different types of jellies.

Phylum Cnidaria

Most jellyfish belong to the phylum Cnidaria (pronounced nye-derry-a). The name is derived from the Greek word for nettle, *cnida*. Cnidarians have one thing in common – stinging cells, known as nematocysts, used for defence and capturing prey. Cnidarian jellyfish are technically called medusae and are at the adult stage of their life-cycle. They are a very diverse group and are spread across four taxonomic classes:

Class Staurozoa (stalked jellyfish)

These are the most primitive jellyfish, differing from all others in having a stalk that attaches them to the sea floor. Their life-cycle does not include a pelagic free-swimming stage, and they are small cryptic animals that grow only to a few centimetres tall. In New Zealand waters, they are most commonly encountered on brown seaweeds, where they are well camouflaged, but one whitish form is found on rock walls at the Poor Knights Islands and in the southern fiords. Individuals resemble inside-out umbrellas, with an adhesive disc at the base of the stalk. They usually have eight arms which each have a cluster of short tentacles at their tips. The mouth is located at the apex of the umbrella. There are only about 50 species worldwide. No stalked jellyfish are included in this version of the guide.



Class Cubozoa (box jellyfish)

These are a small group of jellies separated into two orders – Carybdeida and Chirodropida. Box jellyfish are characterised by their cube, or box-shaped bell, with single tentacles or clusters of long, thin tentacles found attached to a pedalium (a muscular thickening) on each corner of the bell. Members of Carybdeida only have one tentacle per pedalium, but may have more than one pedalium in each corner of the bell. In contrast, members of Chirodropida have more than one tentacle on each pedalium, but only one pedalium on each corner. Remarkably, box jellies contain sensory organs called rhopalia which contain a number of light-sensitive cells in functional eyes, plus a balance organ (a statocyst) to help tell the animal which way is up.

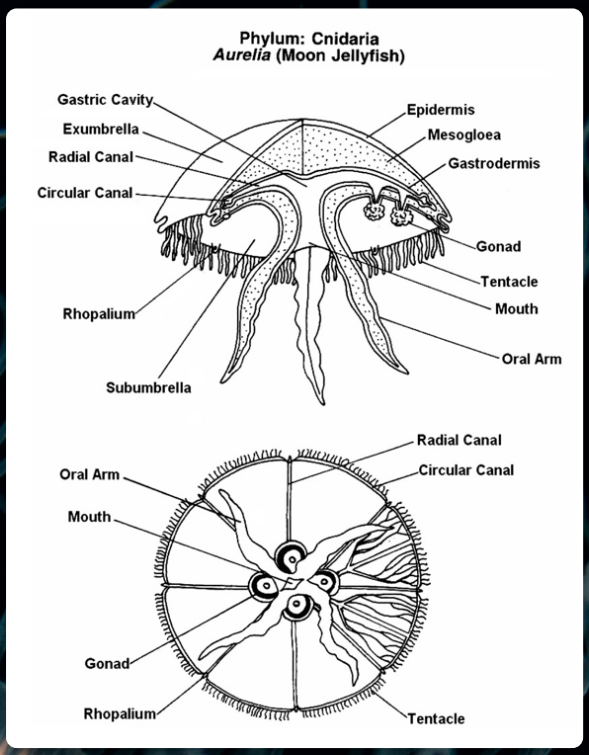
Box jelly tentacles are packed with nematocysts, and their venom is capable of causing pain and a rash. One very well-known chirodropid box jelly in Australia, *Chironex fleckeri*, has a lethal sting. It is considered to be one of the most dangerous animals in the world. Fortunately, no chirodropid box jellies are found in New Zealand, and in fact there is only one tiny species known from New Zealand waters. There are only 51 described species worldwide.

Class Scyphozoa (true jellyfish)

References to 'jellyfish' most often apply to this group because they are large, colourful, common and have the traditional round jellyfish look and shape. Scyphozoan jellyfish have what is called tetraradial symmetry – although circular, the body has four quadrants. They are characterised by a large body (bell), which may or may not have a warty appearance, and gonads and a mouth located within the bell area. The bell margin is scalloped into semi-circles called lappets, from which the tentacles emanate. Nematocysts are found on the marginal tentacles and sometimes on the bell. The mouth contains four corners with usually four oral arms dangling below it.

There are three main types of scyphozoan jellyfish - **coronate** (order Coronatae), **semaeostome** (order Semaeostomeae) and **rhizostome** (order Rhizostomeae) jellyfish.

Coronate jellyfish are characterised by having a circular groove around the middle of the bell, creating two distinct sections. Short tentacles can be found hanging from the bell margin between the lappets. Coronate jellies are found mostly in oceanic waters in the deep-sea, so are not mentioned in this guide.



Semaeostome jellies (Order Semaeostomeae) are characterised by long hollow tentacles located on or near the bell margin, which is divided into lappets (see image of *Pelagia noctiluca* on page 14). The bell does not have a circular groove and it is large and dome-shaped. The oral arms are also large and frilly, around the central mouth.

Rhizostome jellies have one main characteristic difference from the above groups – they do not have tentacles on the bell margin. Also, the four corners of the mouth are elongated and divide into eight oral arms, called mouth-arms, with several mouth openings on each mouth-arm. Some tropical species have symbiotic algae; these 'upside-down' jellyfish live in shallow water with the tentacles facing upwards so the algae can photosynthesise.

There are only about 200 named species of 'true' (scyphozoan) jellyfish worldwide, but the real number of species could be twice that. There is much variation in appearance, and gene sequencing could be useful in determining the taxonomic importance of this variability, but there are surprisingly very few jellyfish specialists around the world.

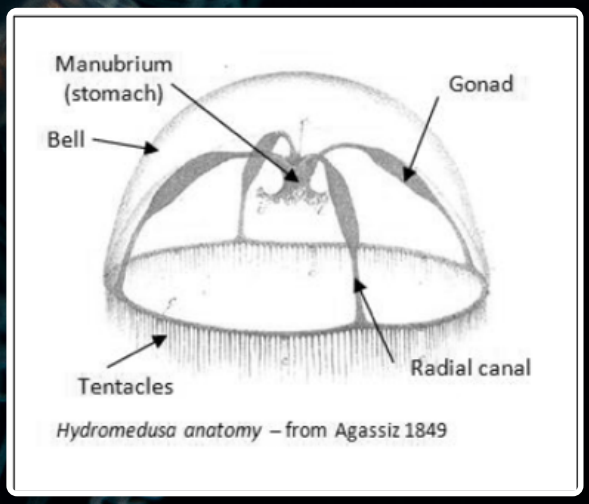
Class Hydrozoa hydroids, (hydromedusae)

Hydrozoa, including hydroids and hydromedusae, is the most diverse group of cnidarian animals. The number of known species in the world currently is about 3,800. Hydroids are divided into two subclasses – Hydroidolina and Trachylinae.

Hydroidoline hydroids are further split into three orders – Siphonophorae (siphonophores, in this guide), Anthoathecata (athecate hydroids and medusae, in this guide) and Leptothecata (thecate hydroids and medusae).

Trachyline hydroids are split between a further four orders - Limnomedusae (freshwater hydromedusae), Actinulida, Narcomedusae and Trachymedusae.

Hydrozoans generally have two main life-cycle stages – the polyp and the medusa. The polyp stage is normally referred to as a hydroid and may be solitary or colonial. The medusa stage (called a hydromedusa) is the sexual



Taken from Gershwin et al. 2014

phase. It resembles a small jellyfish (from about a millimetre to about 20 cm diameter). Its eggs and sperm are released into seawater and the fertilised egg develops into a planula larva. This typically settles on the seafloor and grows into a single feeding polyp or a colony of many tiny polyps. The polyp stage buds off tiny medusae to complete the life-cycle. Depending on the order to which a hydrozoan species belongs, one of these stages may be more dominant than the other, or one of them will be absent altogether. Some anthoathecate families comprise calcified colonies that superficially resemble small stony corals. The best known of these families in New Zealand is Stylasteridae.

Phylum Ctenophora

Comb jellies, or ctenophores (pronounced "teen-o-four") are mostly planktonic. They are harmless to humans because, unlike cnidarian jellyfish, they lack stinging cells. They are, however, voracious predators of other plankton. Most (in class Tentaculata) catch their prey with sticky cells called colloblasts found on their tentacles which helps to entangle small animals like crustaceans, fish and other zooplankton, while others (class Nuda) lack tentacles, having instead a specialised mouth that allows them to bite jelly-like prey.

There are only about 100 – 150 species of comb jellies worldwide, but their lifestyle and body shapes are very diverse, from round and oval to long wide ribbons. One group (order Platyctenida) is benthic and characterised by a highly flattened body form that resembles some flatworms. All comb jellies except Platyctenida have radial rows of ciliary combs – plates of cilia that move back and forth in a sweeping motion to propel the animal through the water. This movement produces a beautiful shimmering rainbow effect as they diffract light. None of these beauties grace this guide yet.

Phylum Chordata

Salps are planktonic relatives of sea squirts. In summer months, salps wash ashore on many New Zealand beaches, and beachgoers wonder what they are and if they sting. They are completely harmless. Although salps are gelatinous, they are chordates – having a dorsal nerve cord like a vertebrate. The barrel-like salp body is commonly about a centimetre to several centimetres in length and wholly transparent except for the stomach, which appears as a small brown blob inside the body. Salps are open at both ends and move by jet propulsion using muscle contraction. Seawater is drawn in one end and exits at the other, with food particles being trapped by a filter as the water passes through the body. Salps have a complex life-cycle and are found together in long chains or as isolated individuals depending on the phase of growth. Salps can occur in such numbers as to comprise a very important part of marine food webs.

Fire salps (pyrosomes) are a related group, but always colonial. The colony is hollow like a sock, with thousands of connected individuals forming the sock, which can grow so massively in size as to allow a diver to fit inside. Pyrosomes get their name from their ability to glow in the dark.

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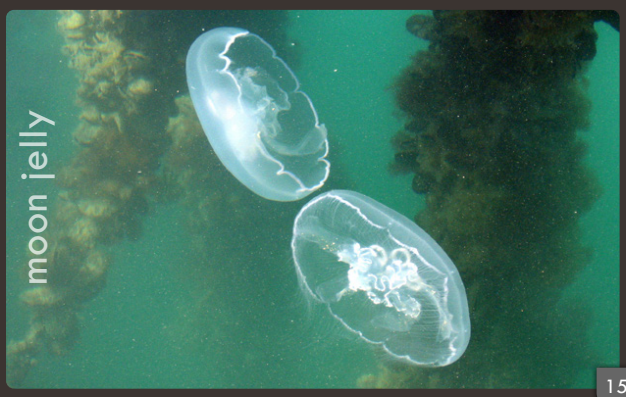

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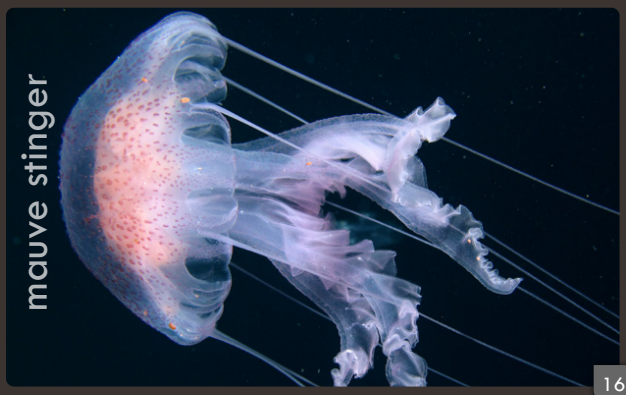
Aurelia sp.

17

Phyllorhiza punctata



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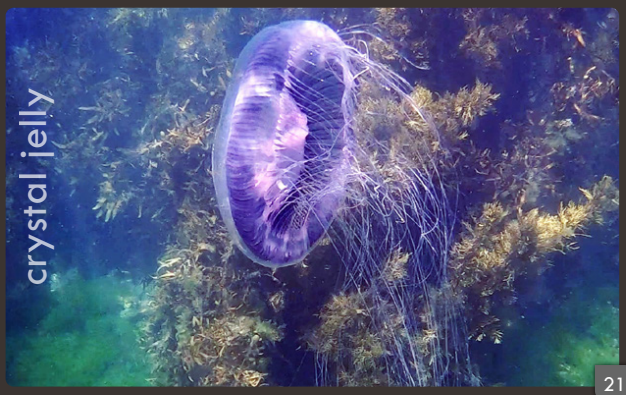
Pelagia noctiluca



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Velella velella

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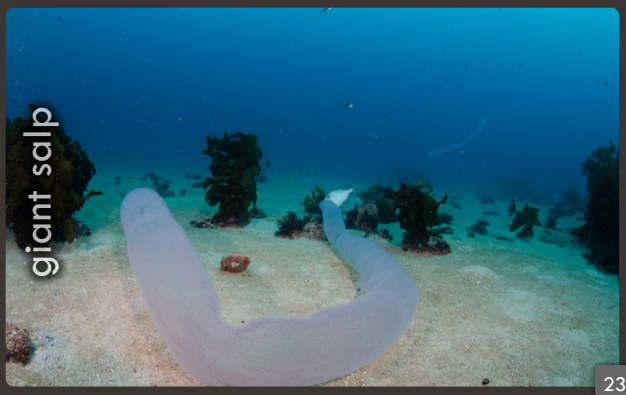

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Pyrostremma spinosum

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Pyrosoma atlanticum

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Copula sivickisi (Stiasny, 1926)

box jellyfish

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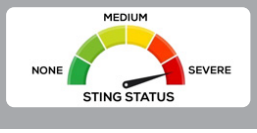
morphology | surface | substrate | habitat



Copula sivickisi is a small, transparent, box-shaped jellyfish with four banded yellow and brown tentacles. The bell has four interradial corners; at each corner is a tentacle attached to pedalia. Tentacles have nematocyst rings and terminal swellings. The bell is transparent with white nematocyst spots on the outside, and its yellow to orange internal organs can be seen: four stomach pouches, four pairs of gonads and four rhopalia. This species also has four sticky pads on top of its bell which are used to attach itself to surfaces so it can rest.

Box jellyfish are known for their deadly stings, especially the deadly box jellyfish *Chironex fleckeri* Southcott, 1956. It is found in northern Australia and causes several injuries and fatalities, and several other box jellyfish species cause Irukandji syndrome. Fortunately, the sting of *Copula sivickisi* is not known to be fatal to humans, although it can leave a blister-like wound. *Copula sivickisi* is the only box jellyfish species known to reside in New Zealand waters and so far has been recorded only from Te Whanganui-a-Tara (Wellington Harbour), Wellington's south coast and Kaikoura. It is also found in many other locations in the Indo-Pacific: Hawai'i, Japan, Thailand, Vietnam, the Philippines, and the Great Barrier Reef and Tasmania in Australia. It is also found in the Caribbean. The depth range is unknown, although these box jellyfish occur generally in shallow coastal waters but also travel to greater depths in the open ocean.

It could also be.....

Turritopsis rubra

main image
Rob Stewart

inset image
Rob Stewart
Crispin Middleton

Lewis, C., Long, T.A.F. (2005) Courtship and reproduction in *Carybdea sivickisi* (Cnidaria: Cubozoa). *Marine Biology* 147: 477-483.

Gershwin, L.-A. (2016) Jellyfish: a natural history. Ivy Press, 224 pp.

Cyanea rosea Quoy & Gaimard, 1824

lion's mane jellyfish

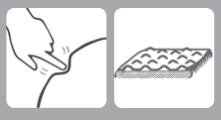
Return to Index

Class Scyphozoa Order Semaeostomeae Family Cyaneidae

12 cm

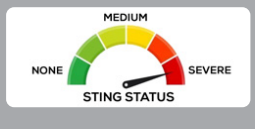
morphology

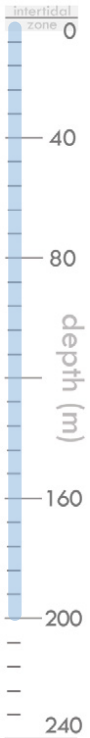
surface



substrate

habitat





This large jellyfish is typically translucent with a bright brownish-pink apex, and a creamy to whitish, scalloped margin which is divided into 32 lappets. The outside of the bell is covered in colourless raised warts, or papillae, mostly concentrated in the middle part. Gastrovascular cavity is divided marginally divided into 16 pouches by straight radial septa. Just inside the bell near the margin are eight clusters of tentacles, each cluster has hundreds of translucent to whitish, short, curly tentacles arranged in several rows. There are four orals arms beneath the bell, which are thick, short, extremely dense and frilly, that are peachy brown in colour.

Cyanea rosea is found around the entire coast of New Zealand, as far south as Campbell Island, and also along the eastern Australian coastline. It is commonly encountered in coastal areas, bays and harbours, as well as in the open ocean. Individuals occasionally swarm in large numbers in warm summer months in bays and harbours when there is an abundance of plankton to feed on. The genus *Cyanea* is found all over the world in polar, subpolar and temperate seas, and less commonly in tropical seas.

It could also be.....

Desmonema gaudichaudi

main image
Rob Stewart

inset image
Rob Stewart
Crispin Middleton

Grange, K. R., Watson, J., Cook S., de C., Barnett, T. J., Brook, F. J. & Cairns, S. D. (2009) Chapter 3 Phylum Cnidaria. In Cook S. de C. (ed.). New Zealand Coastal Marine Invertebrates Volume One, Canterbury University Press, p 137–248.

Gershwin, L.-A. (2016) Jellyfish: a natural history. Ivy Press, 1–224 pp.

Desmonema gaudichaudi (Lesson, 1832)

spotted or speckled jelly

Return to Index

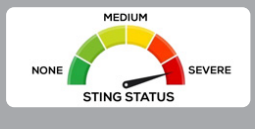
Class Scyphozoa Order Semaeostomeae Family Cyaneidae

morphology

surface

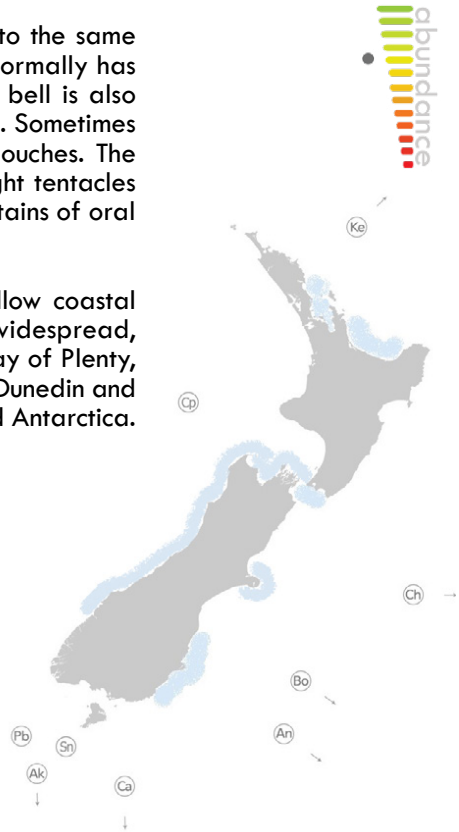
substrate

habitat



Desmonema gaudichaudi is a relative of the lion's mane jellyfish (they belong to the same family) and like *Cyanea rosea* can get quite large. It has a smooth bell which normally has black spots on the surface, but this is a variable character. The colour of the bell is also variable: either uniform white, white with dark patches or dark brown or purple. Sometimes the patches look like leopard spots. Gastrovascular cavity divided into 16 pouches. The margin of the bell is divided into 24 lappets, and eight clusters of long straight tentacles hang in a single row from just inside the bell near the margin. There are four curtains of oral arms with highly folded lips which hang below the centre of the bell.

Desmonema gaudichaudi lives in surface oceanic waters but can occur in shallow coastal bays and harbours. Although not as abundant as the lion's mane jellyfish, it is widespread, having been recorded in waters around Leigh, the Firth of Thames, Auckland, Bay of Plenty, Wellington, Nelson, Marlborough Sounds, West Coast South Island, Christchurch, Dunedin and Stewart Island, and is a known cold-water species from the Southern Ocean and Antarctica.



It could also be.....

Cyanea rosea

images
Serena Cox

inset image
Serena Cox
Oliver Duque

Grange, K. R., Watson, J., Cook S., de C., Barnett, T. J., Brook, F. J. & Cairns, S. D. (2009) Chapter 3 Phylum Cnidaria. In Cook S. de C. (ed.). New Zealand Coastal Marine Invertebrates Volume One, Canterbury University Press, p 137–248.

Jarms, G., Morandini, A. C., Haeckel, E., Schmidt-Rhaesa, A., Giere, O., Straehler-Pohl, I. (2019) *World Atlas of Jellyfish: Scyphozoa Except Stauromedusae*. Dölling und Galitz Verlag, 815 pp.

Aurelia sp. Lamarck, 1816

moon jelly

Return to Index

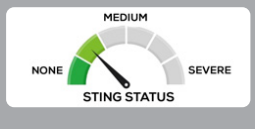
Class Scyphozoa Order Semaeostomeae Family Ulmaridae

morphology

surface

substrate

habitat



Aurelia sp. is the most popular and beautiful of the jellyfishes to watch in aquariums. It has a discus-like, ghostly whitish-transparent bell with a scalloped margin that bears hundreds of short, fine tentacles. There are four conspicuous horseshoe-shaped internal rings inside the upper part of the bell, usually mauve in colour, which are its gonads (reproductive organs). It has four frilly oral arms that drape around the mouth beneath the gonads, projecting below the margin of the bell.

Aurelia sp. is the commonest true jellyfish species in New Zealand and is found around the entire coastline. It is most commonly encountered in shallow coastal water, usually bays and harbours. Adult *Aurelia* feed on tiny phytoplankton organisms such as diatoms and other microalgae, and zooplankton such as juvenile crustaceans and worms. Juvenile *Aurelia* will feed on larval fish. Occasionally they bloom in large swarms, which poses potential problems for salmon farms as they can cause mass fish kills. The genus *Aurelia* is found all over the world in all coastal habitats, however it is unclear which species is present in New Zealand. It has been suggested that *Aurelia aurita* and/or *Aurelia labiata* is the local species, but this has not yet been confirmed.

images
Chris Woods

Grange, K. R., Watson, J., Cook S., de C., Barnett, T. J., Brook, F. J. & Cairns, S. D. (2009) Chapter 3 Phylum Cnidaria. In Cook S. de C. (ed.). New Zealand Coastal Marine Invertebrates Volume One, Canterbury University Press, p 137–248.

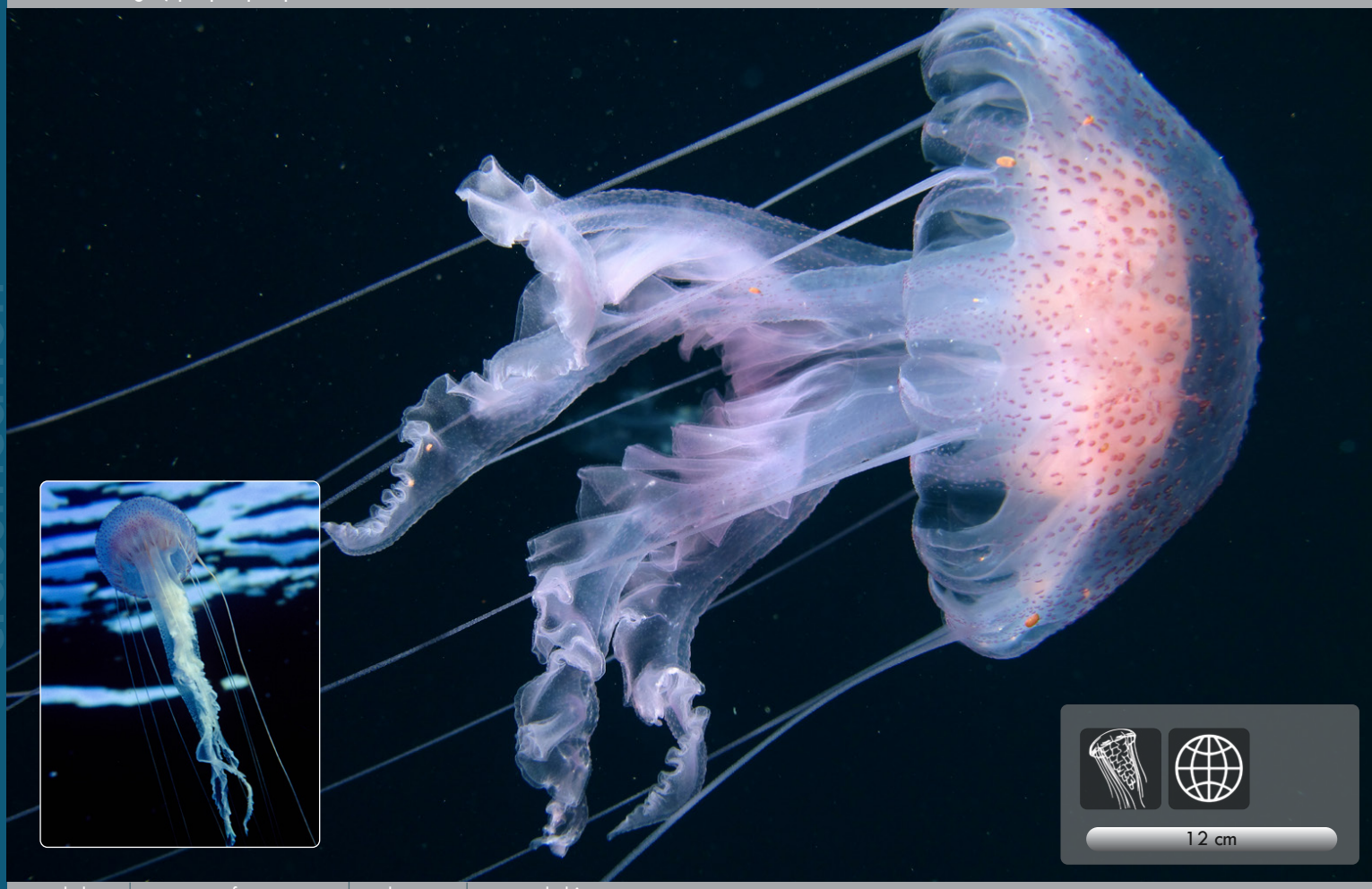
Gershwin, L.-A. (2016) Jellyfish: a natural history. Ivy Press, 1–224 pp.

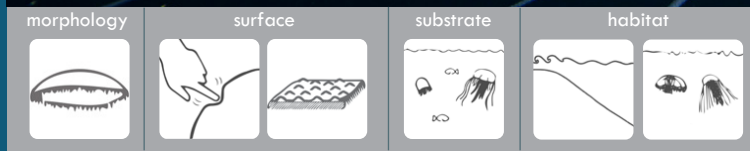
Pelagia noctiluca (Forsskål, 1775)

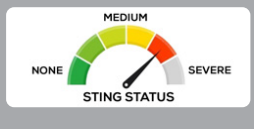
mauve stinger; purple people eater

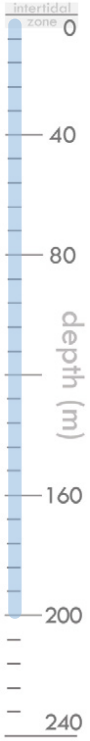
Return to Index

Class Scyphozoa Order Semaeostomeae Family Pelagiidae









Pelagia noctiluca has a hemispherical to flattened bell of thick jelly covered in colorful nematocyst warts. The margin of the bell is divided into 16 rectangular-shaped lappets with rounded corners, and there are eight long marginal tentacles alternating with eight dark marginal statocysts. The colour of the bell is variable, most often brownish-yellow or pinkish-purple. The tentacles and gonads are darker in colour than the bell. There are four long, pointed, very frilly oral arms.

Pelagia noctiluca is a voracious predator that will eat almost anything. Its prey include hydromedusae, ctenophores, small crustaceans and other plankton. It is usually found in oceanic deep water away from the coast but can swarm in large numbers and drift to the shore in late summer and winter around the northern waters of New Zealand, specifically Northland's east coast and the Bay of Plenty. This species is widely distributed in tropical and subtropical waters around the world.

Interestingly, unlike most scyphozoan jellyfish, *Pelagia noctiluca* doesn't have a polyp stage as part of its life-cycle. Usually the planula larva settles onto the seafloor before developing into a polyp which would then produce small jellyfish medusae by strobilation. Instead, *Pelagia noctiluca* develops directly from planula larva into a larval medusa, or ephyra, and the whole process takes only about 92 hours.

It could also be.....

Desmonema gaudichaudi

main image
Crispin Middleton

inset image
Malcolm Francis

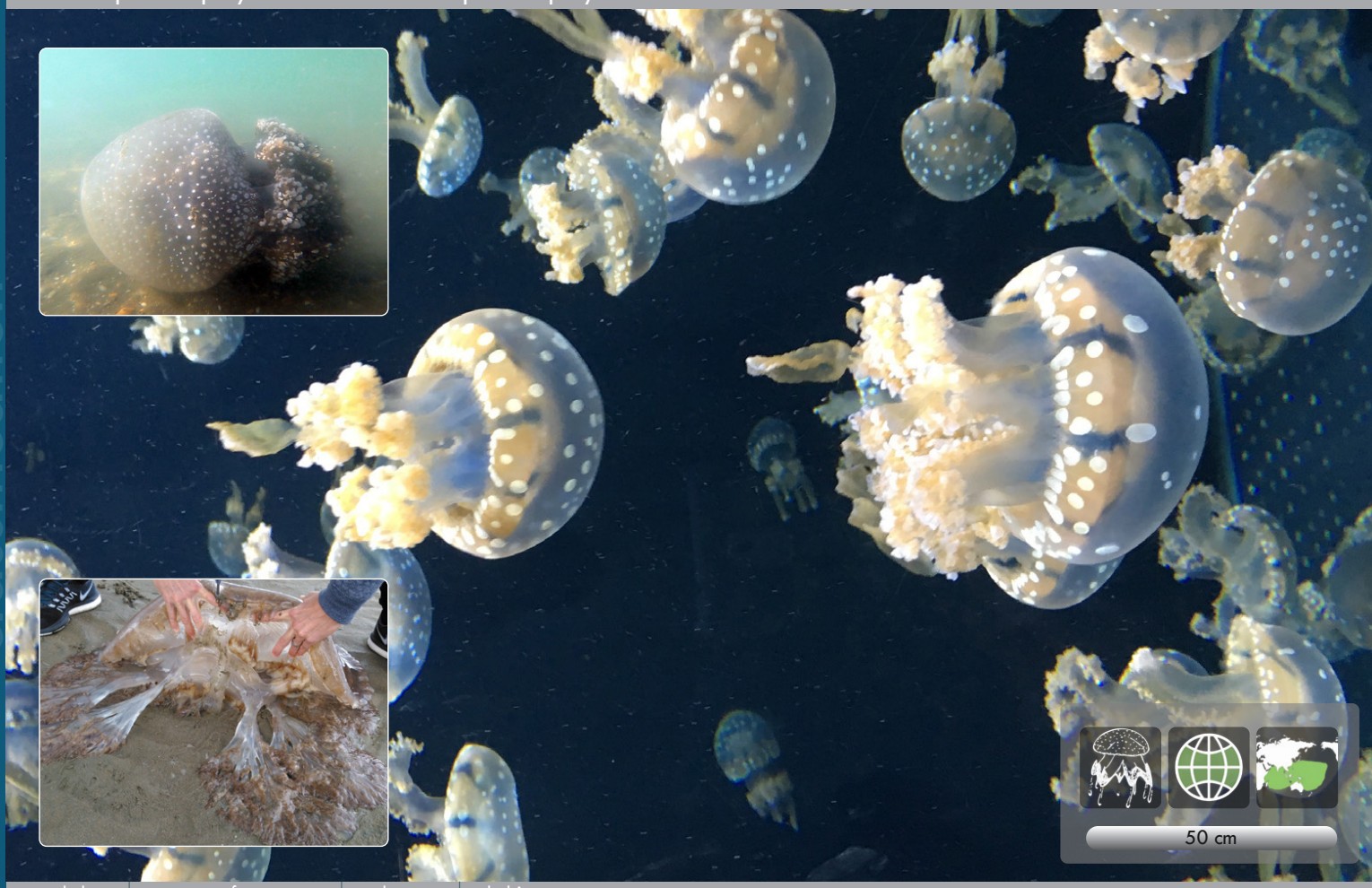
Gershwin, L.-A. (2016) Jellyfish: a natural history. Ivy Press, 1–224 pp.

Grange, K. R., Watson, J., Cook S., de C., Barnett, T. J., Brook, F. J. & Cairns, S. D. (2009) Chapter 3 Phylum Cnidaria. In Cook S. de C. (ed.). New Zealand Coastal Marine Invertebrates Volume One, Canterbury University Press, p 137–248.

Phyllorhiza punctata von Lendenfeld, 1884

white-spotted jellyfish or Australian spotted jellyfish

Return to Index



morphology | surface | substrate | habitat

Phyllorhiza puncata has a large hemispherical bell, about half as high as it is wide. The surface of the bell is finely granulated with some raised warts. There are up to 112 lappets around the bell margin. The bell is transparent blueish or yellow-brown, with white spots. Being a rhizostome jellyfish, it has no marginal tentacles but it does have eight thick, fleshy, branched mouth-arms, each with long terminal club-shaped appendages.

Originally described from southeastern Australia, its native distributional range is the western Pacific from Japan to northern New Zealand but it is considered an invasive species in other parts of the world. Rhizostome jellyfish are known as the upside-down jellyfishes. They are plankton feeders and some tropical species have phytoplankton in the tentacles that they expose to sunlight by lying face up in shallow water.

main image
Jennifer Beaumont

inset images
Crispin Middleton
Chris Woods

Jarms, G., Morandini, A. C., Haeckel, E., Schmidt-Rhaesa, A., Giere, O., Straehler-Pohl, I. (2019) World Atlas of Jellyfish: Scyphozoa Except Stauromedusae. Dölling und Galitz Verlag, 815 pp.

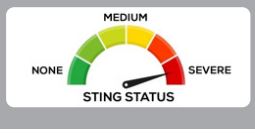
Physalia physalis (Linnaeus, 1758)

Portuguese man-o'-war; blue bottle; katiaho

Return to Index

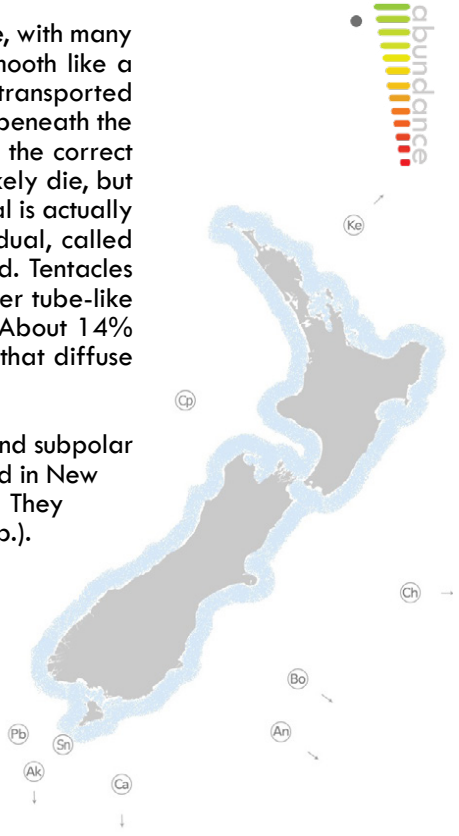
Class Hydrozoa | Order Siphonophorae | Family Physaliidae

morphology | surface | substrate | habitat



Blue bottles appear as clear, bluish gas-filled floats floating on the water surface, with many long bright-blue tentacles trailing behind the float under water. The float is smooth like a balloon and has a crest, catching the wind and allowing the blue bottle to be transported across the sea surface. Depending on whether the mass of tentacles is attached beneath the float more to the right or the left affects the direction of drift. Individuals with the correct alignment for an onshore wind then become stranded on land where they will likely die, but are still capable of producing stings. *Physalia* is a siphonophore so each individual is actually a colony of many smaller individuals. The tentacles are each a type of individual, called a dactylozooid, that has a defensive role and also stings prey animals for food. Tentacles can stretch out to 10 m or more in length. Between the tentacle bases are smaller tube-like feeding and reproductive polyps (respectively gastrozooids and gonozooids). About 14% of the gas in the float is carbon monoxide; other gases are atmospheric gases that diffuse into the float.

Blue bottles live at the ocean surface and are found worldwide except for polar and subpolar regions, but are mainly tropical/subtropical and warm-temperate. They are found in New Zealand waters during warm summer months and often wash up on beaches. They are preyed on by pelagic sea slugs (*Glaucus* spp.) and violet snails (*Janthina* spp.).



It could also be.....

Velella velella

main image
Jennifer Beaumont

inset images
Crispin Middleton
Chris Woods

Gershwin, L.-A. (2016) Jellyfish: a natural history. Ivy Press, 1–224 pp.

Grange, K. R., Watson, J., Cook S., de C., Barnett, T. J., Brook, F. J. & Cairns, S. D. (2009) Chapter 3 Phylum Cnidaria. In Cook S. de C. (Ed), New Zealand Coastal Marine Invertebrates Volume One, Canterbury University Press, p 137–248.

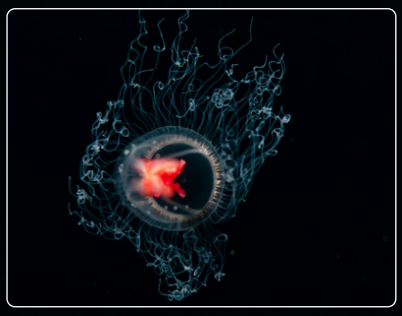
Turritopsis rubra (Farquhar, 1895)

crimson jelly

Return to Index

Class Hydrozoa | Order Anthoathecata | Family Oceaniidae

classification

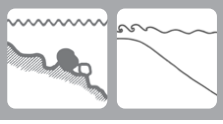


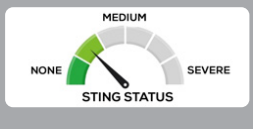
morphology

surface

substrate

habitat

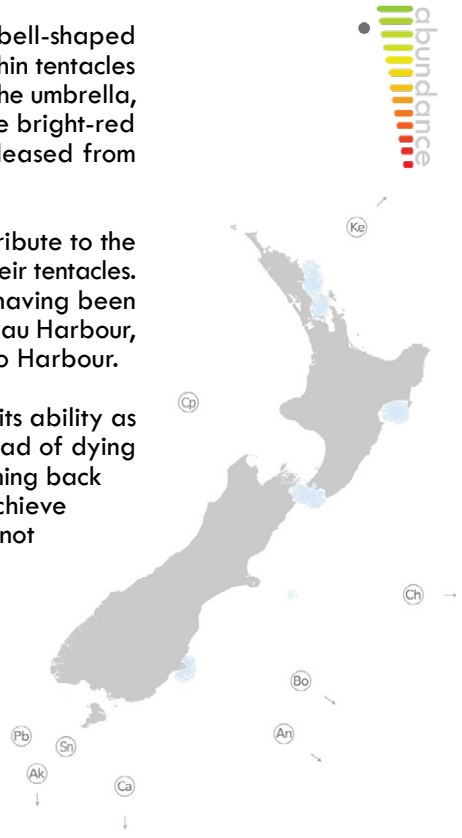




These jellyfish are quite small (adults are only about 1–2 cm diameter), with a bell-shaped umbrella that is taller than wide, with a fringe of up to 120 closely spaced long thin tentacles around the margin of the umbrella. The tentacles can either be coiled up close to the umbrella, or extended out in strings to catch food. The umbrella is transparent, allowing the bright-red stomach and gonads to be seen. It is an energetic swimmer. Individuals are released from the medusa bud of a tiny colonial polyp stage.

They can swarm around the coast in summer in shallow, coastal water. They contribute to the food web as part of the coastal plankton, capturing small planktonic animals with their tentacles. They have a South Pacific distribution and are found all around New Zealand, having been recorded from Bream Bay, Hauraki Gulf, Goat Island Marine Reserve, Whangateau Harbour, Waitemata Harbour, Wellington Harbour, Cook Strait, Hawke's Bay and Otago Harbour.

A close relative, Turritopsis dohrnii, is known as the immortal jellyfish because of its ability as an adult to reverse its lifecycle by turning back into a juvenile (polyp stage) instead of dying when living conditions get tough. It then waits for conditions to improve before turning back into an adult medusa. Essentially, T. dorhnii can escape death and potentially achieve immortality, and this ability is unparalleled in the animal kingdom. It is currently not known whether Turritopsis rubra can also reverse its lifecycle.



images
Crispin Middleton

Schuchert, P. (1996) The Marine Fauna of New Zealand: Athecate Hydroids and their Medusae (Cnidaria : Hydrozoa). New Zealand Oceanographic Institute Memoir 106: 1–159.

Grange, K. R., Watson, J., Cook S., de C., Barnett, T. J., Brook, F. J. & Cairns, S. D. (2009) Chapter 3 Phylum Cnidaria. In Cook S. de C. (ed.). New Zealand Coastal Marine Invertebrates Volume One, Canterbury University Press, p 137–248.

Velella velella (Linnaeus, 1758)

by-the-wind sailor; katiaho rere

Return to Index

Class Hydrozoa Order Anthoathecata Family Porpitidae

2 cm

morphology | surface | substrate | habitat

STING STATUS: NONE | MEDIUM | SEVERE

intertidal zone 0 — 40 — 80 — 160 — 200 — 240 depth (m)

Velella velella is exquisitely bright blue, with a flat float in the form of a chitinous oval disc that bears a vertical triangular sail. Its stinging tentacles dangle down from the margin of the disc. Sails come in two forms — either oriented from left to right or right to left, which affects the way that they catch the wind.

Velella velella is pelagic, meaing it lives at the sea surface, and is therefore carried by water currents and wind. It feeds on pelagic organisms and has symbiotic algae (zooxanthelle) in its tissues. Is is preyed on by pelagic sea slugs *Fiona pinnata* and *Glaucus* spp., violet sea snail *Janthina janthina*, and the sunfish, *Mola mola*.

Velella velella is found on the surface of tropical to temperate waters around the world. After a period of sustained onshore winds, it can be found washed up on beaches around the country, sometimes in smelly mass strandings of millions of individuals.

See:
https://www.stuff.co.nz/environment/97891177/bright-blue-stranding-of-millions-of-creatures-on-wellington-beach

https://www.facebook.com/nzniwa/posts/1360314324079112

abundance

It could also be.....
Physalia physalis

images
Diana Macpherson

Schuchert, P. (1996) The Marine Fauna of New Zealand: Athecate Hydroids and their Medusae (Cnidaria : Hydrozoa). New Zealand Oceanographic Institute Memoir 106: 1–159.

Grange, K. R., Watson, J., Cook S., de C., Barnett, T. J., Brook, F. J. & Cairns, S. D. (2009) Chapter 3 Phylum Cnidaria. In Cook S. de C. (ed.). New Zealand Coastal Marine Invertebrates Volume One, Canterbury University Press, p 137–248.

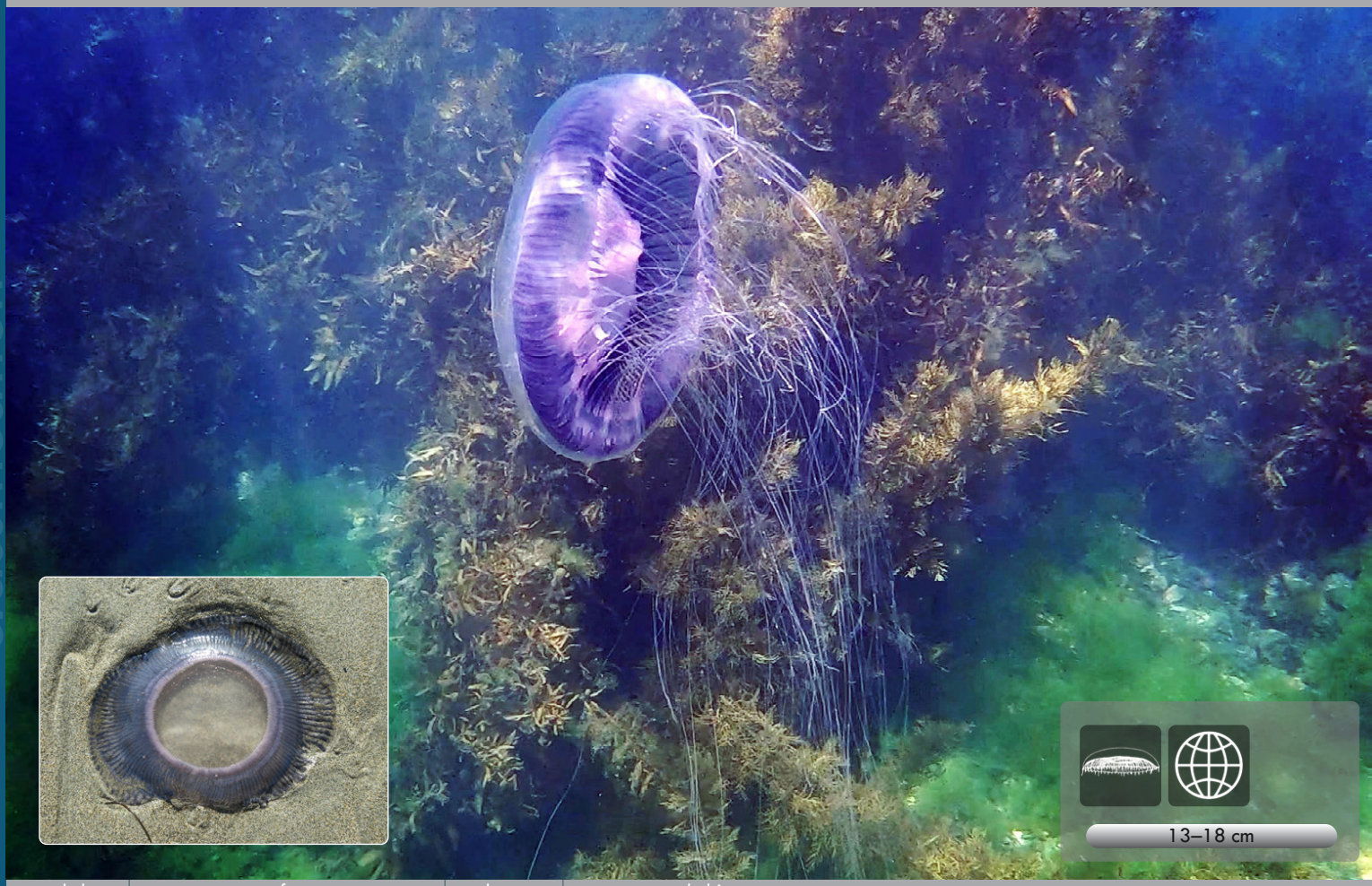
Aequorea forskalea Péron & Lesueur, 1810

many-ribbed jelly or crystal jelly

Return to Index

Class Hydrozoa | Order Leptothecata | Family Aequoreidae

classification

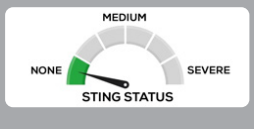


morphology

surface

substrate

habitat



Aequorea forskalea is not a true jellyfish belonging to the class Scyphozoa, but the dominant medusa phase of a species of class Hydrozoa (hydroids). Hydroids mostly form bushy colonies of tiny polyps and some produce a minute sexual medusa phase. In the case of Aequorea, the polyp is very tiny and insignificant and it is the sexual medusa phase that is encountered. At more than 17 cm diameter, this is a giant among hydrozoan medusae and is the largest in our waters. Technically it stings but the sting is so weak most humans don't feel it.

Large, smooth, shallow-domed or saucer-shaped bell, thick in the centre and thinning towards the margin. Around 60–80 purple canals or 'ribs' radiate from the central manubrium to the edge of the bell. Circular manubrium, about half as wide as the umbrella, surrounded by short purple frilly lips. Gonads run along almost the whole length of the radial canals. Many fine tentacles (30–160) hang from the edge of the bell.

Three species have been reported in New Zealand waters: *Aequorea australis* Uchida, 1947 (up to 2.5 cm diameter), *Aequorea forskalea* Péron & Lesueur, 1810 (to 17.5 cm) and *Aequorea macrodactyla* (Brandt, 1835) (to 7.5 cm). *Aequorea forskalea* is the one commonly noted because of its size and it commonly appears when the sea temperature is slightly higher than normal. Depth range is relatively unknown.

Catches planktonic prey with its tentacles. This species is found worldwide and it appears in New Zealand waters during warmer (La Niña) summers.

It could also be.....
Aurelia sp.

images
Alexandra Horsley

inset image
Chris Woods

Bouillon, J.; Barnett, T.J. (1999) The marine fauna of New Zealand: Hydromedusae (Cnidaria: Hydrozoa). *New Zealand Oceanographic Institute Memoir 113*, 1–136.

Cyclosalpa affinis (Chamisso, 1819)

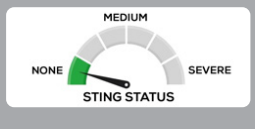
wheel salp

Return to Index

Class Thaliacea Order Salpida Family Salpidae

8–15 cm

morphology | surface | substrate | habitat



Salps belong to the phylum Chordata, which do not have nematocysts. *Cyclosalpa affinis* forms a chain of up to 15 small individuals arranged radially in whorls, or circular clusters. The chain is transparent apart from the small orange ring-shaped stomach and intestine near the centre of each cluster.

Long chains of these clusters are produced by a much larger solitary parent individual. Muscle bands in the body wall of individuals contract to draw water through the body, allowing oxygen exchange, feeding and locomotion. They are eaten by other jellyfish, sea turtles, marine birds and fish.

image
Crispin Middleton

Gershwin, L., Lewis, M., Gowlett-Holmes, K., and Kloser, R. (2014) The pelagic tunicates. In: Pelagic Invertebrates of South Eastern Australia: A field reference guide. Version 1. 1. CSIRO Marine and Atmospheric Research, Hobart.

Kott, P., Bradford-Grieve, J., Esnal, G., Murdoch, R. (2009) Phylum Tunicata - sea squirts, salps, appendicularians. Pp. 411-432 In: Gordon, D.P. (Ed.), New Zealand Inventory of Biodiversity. Volume One. Kingdom Animalia: Radiata, Lophotrochozoa, Deuterostomia. Canterbury University Press, Christchurch. 568 [+16] p.

Pyrostremma spinosum (Herdman, 1888)

giant salp, fire salp

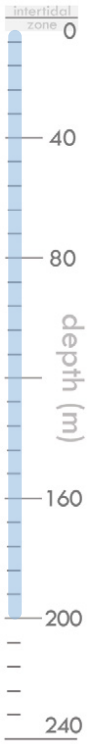
Return to Index

Class Thaliacea | Order Pyrosomatida | Family Pyrosomatidae

upto 20 m

morphology | surface | substrate | habitat

MEDIUM
NONE SEVERE
STING STATUS



Salps belong to the phylum Chordata, which do not have nematocysts. *Pyrostremma spinosum* is a species of pelagic tunicate commonly known as a pyrosome salp, giant salp, or fire salp because of their bioluminesence - they can generate bright blue-green light when stimulated.

Each individual is a free-swimming colony comprising of many zooids that work together to live. The colony is shaped like a large, long, hollow, cylindrical tube. Many individual zooids can be seen as smooth sac-shaped projections on the surface of the tube, causing it to look dimpled or bumpy. The zooids are arranged with their incurrent siphons facing outwards and their excurrent siphons facing inwards, so when water is filtered through them collectively this gives the colony jet propulsion, allowing it to move. Colonies can be pale pink, yellowish or blueish.

They are called giant salps because they can grow up to 20 metres long and 2 metres wide – large enough to accommodate a diver! These colonies therefore constitute the largest planktonic organisms known and the largest free-living invertebrates apart from the giant squid.

Pyrostremma spinosum is a pelagic species found in temperate waters worldwide. Pyrosomes are generally associated with tropical and warm temperate waters, and are generally found in epipelagic or upper mesopelagic layers

It could also be.....
Pyrosoma atlanticum

image
Crispin Middleton

Gershwin, L., Lewis, M., Gowlett-Holmes, K., and Kloser, R. (2014) The pelagic tunicates. In: Pelagic Invertebrates of South Eastern Australia: A field reference guide. Version 1. 1. CSIRO Marine and Atmospheric Research, Hobart.

Kott, P., Bradford-Grieve, J., Esnal, G., Murdoch, R. (2009) Phylum Tunicata - sea squirts, salps, appendicularians. Pp. 411-432 In: Gordon, D.P. (Ed.), New Zealand Inventory of Biodiversity. Volume One. Kingdom Animalia: Radiata, Lophotrochozoa, Deuterostomia. Canterbury University Press, Christchurch. 568 [+16] p.

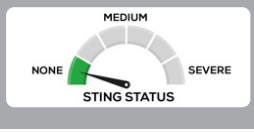
Pyrosoma atlanticum Péron, 1804

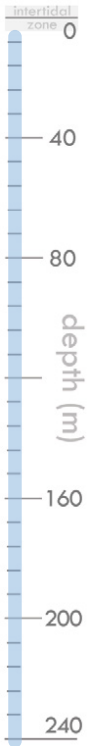
Fire salp

Return to Index

upto 60 cm

morphology | surface | substrate | habitat





Salps belong to the phylum Chordata, which do not have nematocysts.

Pyrosoma atlanticum is a species of pyrosome salp commonly called fire salps because of their bioluminesence - they can generate bright blue-green light when stimulated. Each individual is a free-living colony comprising of many zooids that work together to live. The colony is shaped like a cylindrical tube, or hollow sock; the opening is wide and the other end of the tube is narrow and closed. Many individual zooids can be seen as smooth sac-shaped projections on the surface of the tube, causing it to look dimpled or bumpy. The zooids are arranged with their incurrent siphons facing outwards and their excurrent siphons facing inwards, so when water is filtered through them collectively this gives the colony jet propulsion, allowing it to move. Colonies can be pale pink, yellowish or blueish.

Pyrosoma atlanticum is a pelagic species found in temperate waters worldwide. They live and move vertically through the warmer upper layers of the ocean and filter feed on phytoplankton. Since they live at or near the sea surface they can end up being completely controlled by prevailing winds and currents that can gather them into a dense group and strand them on beaches. They do, however, have the abaility to move slowly through jet propulsion, by moving water through individual zooids as they filter feed. They can play an important role in marine food webs as predators, or prey, or as decomposing scraps of food for suspension feeders in the water or on the seafloor, where bacteria finally process the products of decay.

It could also be.....

Pyrostremma spinosum

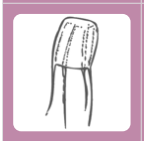
images
Rachel Tan

Gershwin, L., Lewis, M., Gowlett-Holmes, K., and Kloser, R. (2014) The pelagic tunicates. In: Pelagic Invertebrates of South Eastern Australia: A field reference guide. Version 1. 1. CSIRO Marine and Atmospheric Research, Hobart.

Kott, P., Bradford-Grieve, J., Esnal, G., Murdoch, R. (2009) Phylum Tunicata - sea squirts, salps, appendicularians. Pp. 411-432 In: Gordon, D.P. (Ed.), New Zealand Inventory of Biodiversity. Volume One. Kingdom Animalia: Radiata, Lophotrochozoa, Deuterostomia. Canterbury University Press, Christchurch. 568 [+16] p.

icon glossary

BODY PLAN

	true jellyfish (mouth-arm)	Jellyfish belonging to Class Scyphozoa (true jellyfish), Order Rhizostomeae, no tentacles on the bell margin, with elongated mouth-arms
	hydroid medusa (bell)	jellyfish belonging to Class Hydrozoa. Hydroid medusae generally have a transparent bell-shaped umbrella through which the gonads and mouth area can be seen, and tentacles arising from the umbrella margin
	hydroid medusa (sail and float)	jellyfish belonging to Class Hydrozoa. Hydroid medusae with a flattened oval float and vertical sail, as in *Velella velella*
	box jellyfish	jellyfish belonging to Class Cubozoa. Bell is box shaped with four tentacles arising from pedalia.
	wheel salp	A solitary individual releasing its aggregate form, arranged in circular clusters.

	true jellyfish (short tentacles)	jellyfish belonging to Class Scyphozoa (true jellyfish) that have short tentacles and short oral arms
	Hydroid medusa (shallow dome)	Jellyfish belonging to Class Hydrozoa. Hydroid medusa with a transparent shallow dome-shaped umbrella through which the mouth area can be seen, along with purple ribs extending from the mouth towards the edge, and tentacles arising from the umbrella margin, as in *Aequorea forskalea*
	siphonophore	siphonophore jellyfish belonging to Class Hydrozoa that have a balloon-shaped float and long trailing tentacles, as in *Physalia physalis*
	pyrosome salp	cylindrical/tubular in shape
	true jellyfish (long tentacles)	Class Scyphozoa (true jellyfish) that have long trailing tentacles and long, big, frilly oral arms

LIFE HISTORY

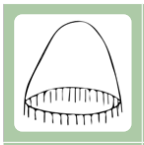
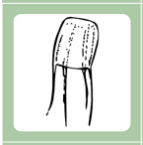
	native	naturally occuring around New Zealand, endemic
	antipodean	naturally occuring around New Zealand and Australia only
	southwest pacific	naturally occuring around New Zealand, Australia and other pacific locations
	Indo-Pacific	oosely defined as the region encompassing the Western Indian Ocean, Southeast Asia, Oceania and the broader Pacific

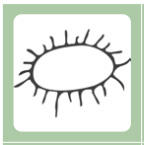
	antarctic	Ross Sea and Southern Ocean
	widespread	species recorded globally
	temperate tropical / circumtropical	region between the Tropics of Cancer and Capricorn

MORPHOLOGY

	balloon float	balloon-shaped float seen floating on the sea surface, *Physalia physalis*

	disc or saucer	umbrella of a jellyfish or a hydromedusa shaped like a flattened disc or saucer, the umbrella is wider than it is tall

	bell	umbrella of a jellyfish or a hydromedusa shaped like a bell, the umbrella height is taller than the width
	box	
	wheel salp	

	oval float	flattened oval-shaped float seen floating on the sea surface, *Velella velella*
	true jellyfish	
	pyrosome salp	*cylindrical/tubular in shape*

SURFACE

	chitinous	tough to the touch, horny texture, *Velella velella*
	smooth	even, hairless, silky, can be slightly undulating
	bumpy	bearing small, rounded bumps
	warty	bearing small flattened bumps or tubercles

	colour-based camouflage	organism is camouflaged at sea because of its bright blue appearance, *Velella velella* and *Physalia physalis*
	soft	soft to the touch, easily compressible, elastic
	transparent	gelatinous and see-through, translucent
	leathery	thick skin, tough, flexible, slightly elastic

SUBSTRATE

	water column	lives in the open ocean throughout the water column

	rock	hard substrate such as mudstone, sandstone, basalt, compressed carbonates

HABITAT

	bays and harbours	bays and harbours, wind and water currents transport organisms into them where they can remain stuck or stranded
	pelagic and/ or oceanic	open ocean
	subtidal	zone below the low tide, including rock flats, slopes, walls, crevices, overhangs, boulder fields, organisms exposed to wave surge and currents, and subdued illumination

	sea surface pleustonic	found floating at the sea surface
	shallow coastal waters	shallow waters around the coastline near land

glossary

bell	see *umbrella*
cilia	tiny hair-like structures used for propulsion or feeding
colloblasts	adhesive cells unique to phylum Ctenophora, containing no venom
dactylozooid	a type of zooid found in colony-forming organisms used for the capture of prey or defence
diatom	a major group of microscopic unicellular algae that are a part of the phytoplankton
ephyra	or larval medusa, the free-swimming larval medusa stage, a mini jellyfish just before it becomes an adult medusa
gastrovascular	of or relating to the stomach and radial canal system.
gastrovascular cavity	main digestive space, stomach, sometimes subdivided by septa and studded with numerous digestive filaments
gastrozooid	a type of polyp found in colony-forming organisms used for feeding
gonad	reproductive organ
gonozooid	a type of polyp found in colony-forming organisms used for reproduction
lappets	flap-like extension of the bell margin
lips	lobe-like extension of the edge of the manubrium surrounding the mouth
medusa	free floating, adult, sexual, pelagic stage in the lifecycle; typically has a disk-shaped body (bell) with oral arms and tentacles
medusa budding	asexual budding of medusae which give rise to a new juvenile medusa individual; in hydroids, budding occurs on the colonial polyp
manubrium	a projection from the underside of the bell which contains the stomach cavity, distally bearing the mouth and proximally leading to the radial canals
mouth-arm	four corners of the mouth are elongated and divide into eight oral arms, called mouth-arms, with several mouth openings on each mouth-arm
nematocysts	stinging organ unique to the phylum Cnidaria; typically, a capsule containing stinging cells which penetrate tissue of prey to paralyse it, or used as defence
oral arm	a structure that hangs from the mouth on the underside of the bell, usually four in number and can be described as frilly and is generally thicker than a tentacle; contains stinging cells and used in food capture
pedalium (pedalia)	a fleshy muscular pad, one or more tentacles are attached to each pedalium
pelagic	open body of water; open sea
phytoplankton	tiny floating marine plants that carry out photosynthesis
plankton	floating organisms found in the pelagic zone that are at the mercy of water movements, composed of microscopic plants and animals, including the larvae or larger animals such as fish; see *phytoplankton* and *zooplankton*
planula larva	the free-swimming first larval stage of many types of jellyfish, before it settles and becomes a polyp
polyp	In scyphozoans, the budlike part of the lifecycle after the planula stage that attaches to a hard substrate; in hydrozoans the basic individual of hydroids, may be isolated or forming colonies, may be of different types and perform different functions, but generally has tentacles and a mouth
rhopalium (rhopalia)	a sense organ used for visual or light-sensing capabilities, and controls the pulsations of the bell and balance
spermatophore	sperm bundle
statocyst	a sense organ used to detect movement, orientation and equilibrium
strobilation	a form of cloning in scyphozoan jellyfish in which a polyp elongates and becomes segmented and each segment develops into an ephyra
symbiosis (symbiotic)	a relationship in which two different species live together
umbrella	the main body of the medusa, or jellyfish, not including the manubrium or tentacles, generally resembles the shape of a bell or an umbrella; the edge of the umbrella is called the margin
zooid	an individual member of a colony forming organism such as a siphonophore, hydroid, salp or pyrosome; each zooid has a particular function within the colony, e.g. zooids responsible for reproduction (gonozooid and phorozooids) and feeding (trophozooids)
zooplankton	tiny floating marine animals
zooxanthellae	single-celled symbiotic algae called a dinoflagellate

acknowledgements

Thanks to all those that have provided identifications and advice on the current taxonomy of the species included in this guide, including Dr Gill Mapstone (Natural History Museum, London); Dr Lisa-ann Gershwin (Research Scientist), and Dr Phil R. Pugh (National Oceanography Centre, Southampton, UK). Thanks to Dr Andrew Forsythe (NIWA Bream Bay) for reviewing sting treatment advice. Thanks also to the photographers of the beautiful specimen images.

The preparation of this guide was funded by NIWA under Coasts and Oceans Research Programme 2 Marine Biological Resources: Discovery and definition of the marine biota of New Zealand (2018/2019 SCI), and Protecting Marine Biodiversity Programme, Documenting Marine Invertebrates project COBR22202 (2021/2022).

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Permission to use the images from the following NIWA New Zealand photographers is gratefully acknowledged: Crispin Middleton (NIWA Bream Bay); Chris Woods (NIWA Christchurch); Rob Stewart, Serena Cox, Malcolm Francis, Jennifer Beaumont, Kate Neill, Lana Young (NIWA Wellington). Special thanks to the following citizen scientists who very kindly allowed the use of their photos in this e-guide: Kim McFadden, Alexandra Horsley, Nicole Miller, Sietse Bouma, Sarah Melville, Richel Tan and Oliver Duque.

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