Your observations matter !

Have you spotted a non-indigenous species ?

What is a non-indigenous species in the Mediterranean ?

Through the Suez Canal, maritime traffic, aquaculture, and the trade of species, many marine organisms that are not naturally present in the Mediterranean are introduced—these are known as **non-indigenous species**.

Climate change creates **favorable** conditions for these species, allowing them to **establish** at the expense of native Mediterranean species. The absence of natural predators further increases their success in settling. They hence become **invasive**, causing significant ecological and economic disruptions.

Some of these species may also pose a risk to human health.

It is therefore crucial to monitor the distribution of these species to ensure proper management and protection of Mediterranean marine ecosystems.

The RAMOGE Agreement has selected 13 non-indigenous species whose establishment is of particular interest to scientists. Any observation within the RAMOGE zone is therefore valuable !

To monitor the establishment of non-indigenous species, we need as much information as possible. The documentation of these species through citizen science provides valuable data for the scientific community. Your observations will be collected and shared with the referral scientists.

How to help us ?

Take **photos** or **videos** of the species

Record the observation **site information** : date, location, depth, habitat type, presence of pollution.

Gather as much information as possible :

Abundance

Size (small, medium, large, based on the species' maximum size)

Behavior (fearful, curious, passive)

Distinctive features or markings

Report your observations at **ramoge.org** or **cromis.ffessm.fr**

FFESSM CROMIS

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Lionfish
Pterois miles


© Alexander VASENIN

Characteristics

Size : Up to 40 cm in length.
Description : Striped body with white and brown or red bands ; highly developed fins ; long spines bordered by a veil along their length. Juveniles are very dark, with even more developed fins.
Diet : Carnivore (crustaceans and fish).
Not to be confused with : No similar species in the Mediterranean.

Living enviornment

Between the surface and 60 m deep, on rocky seabeds. During the day, it prefers dark corners, waiting for nightfall to hunt.

Additional information

Origin : Indo-Pacific and Red Sea (introduced into the Mediterranean through the Suez Canal).

Commercial value : Its meat is appreciated, and its consumption is increasingly encouraged.

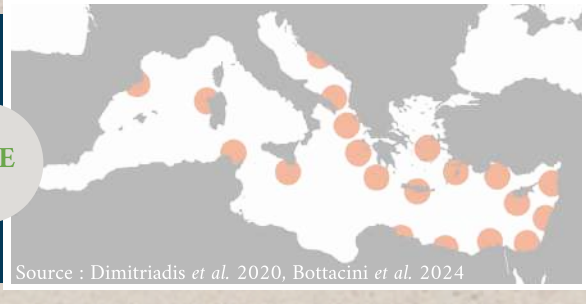
Danger to humans : Venomous but not aggressive. Spines and venom glands are present on the dorsal, pelvic, and pectoral fins. The sting is very painful and can even be fatal.

Environmental impact : Predator of native species, extremely high reproductive capacity, and very few natural predators due to its venomous spines.

Did you know ? The lionfish (*Pterois* sp.) is considered one of the most invasive species in the marine world.

Distribution

CURRENTLY ABSENT FROM THE RAMOGE AREA


Source : Dimitriadis *et al.* 2020, Bottacini *et al.* 2024

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Silver-cheeked toadfish
Lagocephalus sceleratus


© Claudio VIARA

Living environment
Rocky and sandy seabeds, between 15 and 100 m of depth.

Additional information

Origin : Indo-Pacific and Red Sea (introduced into the Mediterranean via the Suez Canal).

Commercial value : None, due to its toxicity.

Danger to humans : Formidable teeth capable of severing a finger (they also cut through fishermen's nets), and the flesh of this fish is toxic, like its Japanese cousin, the fugu. Consuming this fish is therefore very dangerous, even potentially deadly.

Environmental impact : Predator of native species, significant reproductive capacity, and very few natural predators due to its toxicity.

Characteristics

Size, : Generally 40–60 cm long, but up to 1.1 m.
Description : Gray back speckled with black spots, white belly, and a silver stripe from the mouth to the tail fin; small spines on its belly and back. Long, triangular head, with a flat body that can puff up like a balloon by swallowing water.
Diet : Carnivorous (small fish, mollusks, and crustaceans).
Not to be confused with : Other species of *Lagocephalus* sp.: one is native (*L. lagocephalus* – dark back and no spots).


© fishbase, Oddgeir ALVHEIM

The others are non-indigenous and were introduced via the Suez Canal (*L. spadiceus*, with yellowish reflections, and *L. suezensis*, smaller and with brownish tones).

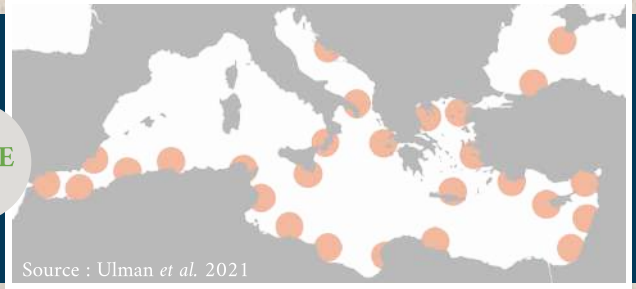

© fishbase, Tran, H.H.


© Randall, J.E., 1997

NB: There are also nearly a dozen non-indigenous pufferfish species, belonging to several different genera.

Distribution

CURRENTLY ABSENT FROM THE RAMOGE AREA


Source : Ulman *et al.* 2021

Census form :
- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Bluespotted cornetfish / Smooth flutemouth
Fistularia commersonii


doris.ffessm © Véronique LAMARE


doris.ffessm © Sabine BOULAUD

Living environment

Near the bottom, down to 50 meters deep or more, over rocky and sandy bottoms and above seagrass beds.

Additional information

Origin : Indo-Pacific and Red Sea (introduced into the Mediterranean via the Suez Canal).

Commercial value : Beginning to be marketed in the eastern Mediterranean for its meat, which is easy to cook.

Danger to humans : None.

Environmental impact : Feeds on many juveniles of native fish species.

Did you know ? In the Red Sea, they are fond of lionfish juveniles, so they might help regulate their population in the Mediterranean.

Characteristics

Size : On average 1 m, up to 1.6 m.

Description : Very elongated slim body, back usually brown to greenish with often darker bands and blue spots, silvery white belly. Tail extended by a long filament. Out of the water, the fish turns gray-green.

Diet : Carnivorous (small fish, crustaceans).

Not to be confused with : Garfish (*Belone belone*), which is smaller and lacks the long filament extending from its body. Very common in the Mediterranean, it swims close to the surface.


doris.ffessm © Roland GRAILLE

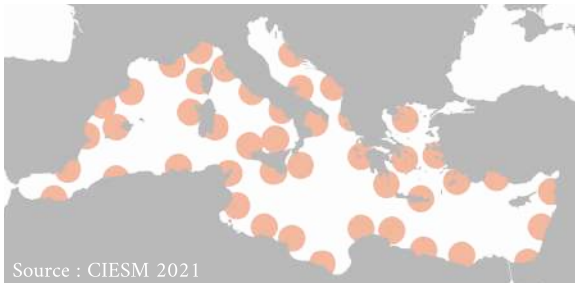
Also not to be confused with pipefishes (*Syngnathus sp.*), which are smaller and lack the long filament extending from the body.


doris.ffessm © Christophe DEHONDT

doris.ffessm © Vincent MARAN

Distribution

PRESENT IN THE RAMOGE AREA


Source : CIESM 2021

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Dusky spinefoot / Squaretail rabbitfish
Siganus luridus


© Santo TIRNETTA

Living environment

Down to 40 metres deep, close to the seabed, mainly above algae and seagrass beds. Can be found in schools.

Additonal information

Origin : Indian Ocean and Red Sea (introduced into the Mediterranean via the Suez Canal).

Commercial value : Now common in the eastern Mediterranean, it is widely fished and consumed.

Danger to humans : Venomous spines on the dorsal fin can cause painful stings, but the fish is not aggressive.

Environmental impact : It competes with native herbivorous species, leading to a significant reduction in algae and seagrass beds, sometimes causing severe habitat degradation. Its spread is relatively rapid.

Characteristics

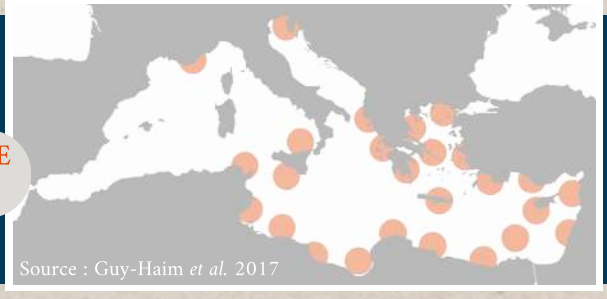
Size : Between 20 and 25 cm.
Description : Oval-shaped body, very variable coloration but generally dark (grayish or brown) with sometimes green-yellow hues on top. The mouth opens downward, and the tail has a straight edge.
Diet : Herbivorous (algae and seagrasses).
Not to be confused with : The karanteen (*Sarpa salpa*), very common above seagrass beds, with a more forked tail fin, clearly visible yellow stripes, and a yellow eye.


© Goran SAFAREK

It can also be confused with *Siganus rivulatus*, which is also a non-indigenous species, having a more elongated body and a slightly more forked tail fin.

Distribution

PRESENT IN THE RAMOGE AREA


Source : Guy-Haim *et al.* 2017

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Marbled spinefoot / Rivulated rabbitfish

Siganus rivulatus

doris.ffessm © Valérie CARO

© Pierpaolo CONSOLI

Characteristics

Size : Between 25 and 30 cm.
Description : Fusiform body with a forked tail fin, pale gray in color, sometimes with yellow stripes.
Diet : Herbivorous (algae and seagrasses).
Not to be confused with : The karanteen (*Sarpa salpa*), very common above seagrass beds, with a more forked tail fin, clearly visible yellow stripes, and a yellow eye.

© Goran SAFAREK

Also not to be confused with *Siganus luridis*, which is also a non-indigenous species, having a more rounded body and a straight tail fin.

Additional information

Origin : Indian Ocean and Red Sea (introduced into the Mediterranean via the Suez Canal).

Commercial value : Not very popular in restaurants despite being abundant in the eastern Mediterranean.

Danger to humans : Venomous spines on the dorsal fin that can cause painful stings, but the fish is not aggressive.

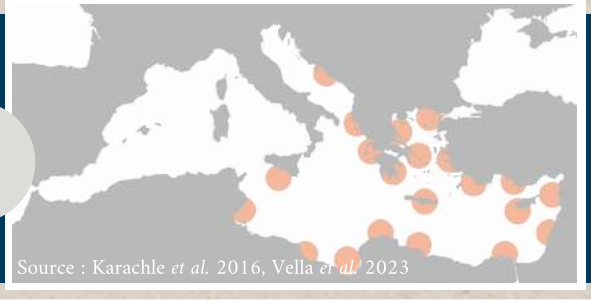
Environmental impact : It competes with native herbivores and leads to a significant decrease in algae and seagrass beds, sometimes causing severe habitat degradation. Its spread is relatively fast.

Living environment

Up to 40 meters deep, near the bottoms, especially above algae and seagrass beds. They can form schools.

Distribution

CURRENTLY ABSENT FROM THE RAMOGE AREA



Source : Karachle *et al.* 2016, Vella *et al.* 2023

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive featuers or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Reef stonefish
Synanceia verrucosa


doris.ffessm © Vincent MARAN

Living environment

Rocky or mixed bottoms down to 50 m deep, can also bury itself in the sand.

Additional information

Origin : Indo-Pacific and Red Sea (introduced into the Mediterranean via the Suez Canal).

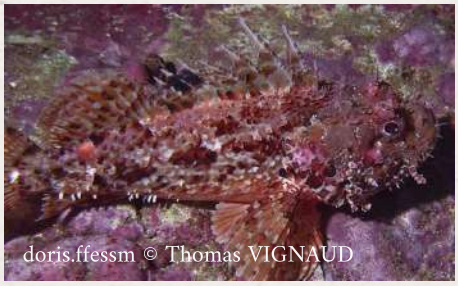
Commercial value : None.

Danger to humans : Has 12 to 14 venomous spines on the protuberances of the dorsal fin, with stings that can be fatal. It is one of the most venomous and dangerous marine species in the world due to its excellent camouflage ability.

Environmental impact : Predator of native species, with very few natural predators itself.

Characteristics

Size : Up to 40 cm long.
Description : Massive and stocky body, wide head with eyes directed upwards, excellent camouflage with rocks, very variable color, dorsal fin with fleshy protuberances hiding long and strong spines, highly developed pectoral fins.
Diet : Carnivorous and a large predator (fish, crustaceans).
Not to be confused with : The red scorpionfish (*Scorpaena scrofa*), less massive with a spiny dorsal fin instead of fleshy protuberances, and eyes on the sides.


doris.ffessm © Thomas VIGNAUD

Distribution

CURRENTLY ABSENT FROM THE RAMOGE AREA


Source : CIESM 2021

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Bluespotted seabass / Spotted grouper
Cephalopholis taeniops


© Pedro CAMBRARIA DUARTE

Characteristics

Size : Up to 70 cm.
Description : Red-orange coloration with blue spots.
Diet : Carnivorous and a big predator (fish, crustaceans, mollusks).
Not to be confused with : Other fish from the same family, *Serranidae*, such as the dusky grouper (*Epinephelus marginatus*) or the goldblotch grouper (*Epinephelus costae*), naturally present in the Mediterranean, but the bright colors and blue spots make it easy to avoid confusion.

E. marginatus


doris.ffessm © Christophe DEHONDT

E. costae


doris.ffessm © Michel BARRABES

Living environment

From 20 to 200 metres deep, on rocky and sandy seabeds

Additional information

Origin : Atlantic, African coast (introduced into the Mediterranean via the Strait of Gibraltar).

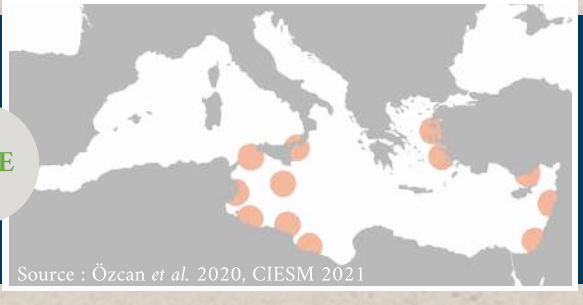
Commercial value : Not widely marketed in the Mediterranean, but its flesh is appreciated in its natural distribution area.

Danger to humans : None.

Environmental impact : Predator of native species.

Distribution

CURRENTLY ABSENT FROM THE RAMOGE AREA


Source : Özcan *et al.* 2020, CIESM 2021

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Monrovia doctorfish

Acanthurus monroviae

© Filipe LOPES DA SILVA

Living environment

From 5 to 50 meters deep, on rocky bottoms or wrecks. Often in schools.

Additional information

Origin : West Atlantic (introduced into the Mediterranean via the Strait of Gibraltar).

Commercial value : Very rarely consumed.

Danger to humans : Like all surgeonfish, it has an erectile spine at the base of the tail fin that is particularly sharp and can be deployed for defense. Their name comes from the fact that this spine is as sharp as a scalpel.

Environmental impact : Rapid reproduction; very few natural predators; forms schools of many individuals, leading to a significant decrease in algae and degrading habitats.

Characteristics

Size : Around 20 cm but can reach up to 45 cm.

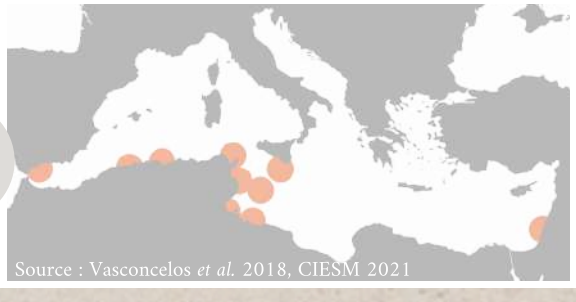
Description : Oval and flattened body, pale to dark gray color, dark edges on the fins, yellow-orange spot around the erectile spine at the base of the tail fin.

Diet : Omnivorous (grazes on algae covering the substrate, scrapes detritus, can also consume zooplankton and small invertebrates).

Not to be confused with : No similar species in the Mediterranean.

Distribution

CURRENTLY ABSENT FROM THE RAMOGE AREA



Source : Vasconcelos *et al.* 2018, CIESM 2021

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Sergeant major fish
Abudefduf sp.

Characteristics

Size : Up to 20 cm.

Description : High and flattened body, silver in color with 4 or 5 vertical black stripes, top of the back yellowish sometimes tinged with blue, forked tail.

Diet : Omnivorous (algae, small invertebrates, larvae).

Not to be confused with : The zebra seabream (*Diplodus cervinus*), larger (up to 50 cm), with a less forked tail fin and a more prominent forehead.

Living environment

In open water and in shallow rocky areas, down to 13 meters deep. They are often in schools.

Additional information

Origin : Indo-Pacific and Red Sea (introduced into the Mediterranean via the Suez Canal).

Commercial value : None.

Danger to humans : None.

Environmental impact : Less harmful than other non-indigenous species, its spread should still be monitored. In fact, schools of *Abudefduf sp.* feed on native species, particularly their larvae.

Distribution

PRESENT IN THE RAMOGE AREA

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

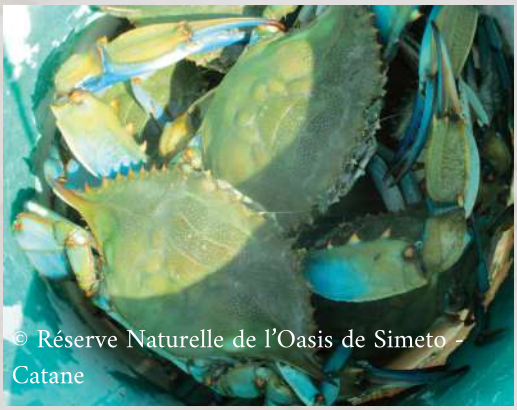
And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Blue crab
Callinectes sapidus


© Réserve Naturelle de l'Oasis de Simeto - Catane

© Roberto COSTANTINI

Characteristics

Size : Up to 23 cm in width.

Description : Large shell with a blue-green color, featuring a row of spines along the edges, with a prominent one on each side. Azure legs and claws, with the last pair of legs ending in a flattened paddle.

Diet : Omnivorous with a carnivorous tendency (gastropods, bivalves, crustaceans, sometimes even small fish, worms, and jellyfish; occasionally algae, marine plants, and detritus).

Not to be confused with : No similar species in the Mediterranean.
However, it can be confused with the blue crab from the Red Sea, also non-indigenous (*Portunus segnis*).


© Alain DEIDUN

Additional information

Origin : Atlantic (introduced into the Mediterranean via maritime traffic).

Commercial value : Very high commercial value in its native distribution area, it is also increasingly fished and consumed in the eastern Mediterranean.

Danger to humans : Its claws are very sharp. It can also significantly damage fishermen's nets, representing a major economic impact.

Environmental impact : Very rapid proliferation and growth; fast spread; consumes a very wide variety of prey.

Living environment

Estuaries, lagoons, and sea, freshwater ; up to 35 meters deep. Sandy and muddy bottoms.

Distribution

PRESENT IN THE RAMOGE AREA


Source : Castriota *et al.* 2024

Census form :

- Observation site
- Abundance
- Size (small, medium, large)
- Behavior
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Caulerpa taxifolia

© Alain DEIDUN

Characteristics

Size : 20 to 30 cm in height.

Description : Feathery, bright green stems, connected by a stolon that can reach several meters in length. It can form fields covering several dozen or even hundreds of square meters.

Diet : Photosynthetic algae.

Not to be confused with : No similar species in the Mediterranean.

Living environment

From 0 to 50 m deep, in warm waters (>20°C). It settles on sand, rock, or coralligenous areas.

Additional information

Origin : Indo-Pacific, tropical Atlantic. Accidentally introduced into the Mediterranean from the Oceanographic Museum of Monaco.

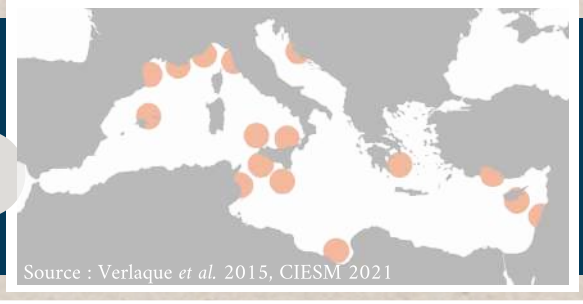
Commercial value : None.

Danger to humans : None.

Environmental impact : Rapid proliferation through asexual reproduction and very little consumed by herbivores; rapid expansion at the expense of native species such as posidonia, thus altering benthic assemblages and the entire associated ecosystem.

Distribution

PRESENT IN THE RAMOGE AREA



Source : Verlaque *et al.* 2015, CIESM 2021

Census form :

- Observation site
- Abundance
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Caulerpa cylindracea

Characteristics

Size : 3 to 6 cm in height on average, 3 to 10 mm in width.

Description : Stems connected by stolons and topped with cylindrical or rounded branches of about 3 mm in diameter. Coloration ranges from light green to dark green.

Diet : Photosynthetic algae.

Not to be confused with : No similar species in the Mediterranean.

Living environment

From 0 to 70 m, most commonly between 15 and 30 m. It settles on all types of substrates, except on unstable soft bottoms.

Additional information

Origin : Atlantic, Indian Ocean, West Pacific. Genetic analyses suggest it was introduced from populations present to the west of Australia. The mode of introduction is still debated: maritime traffic, aquarium trade, or even intentional introduction.

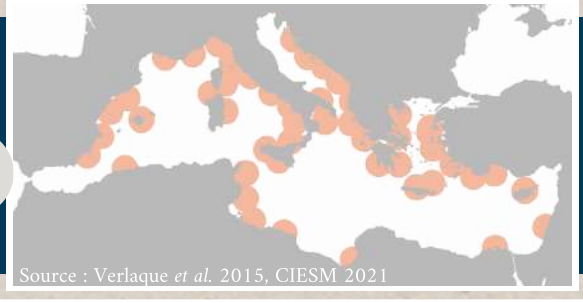
Commercial value : None.

Danger to humans : None.

Environmental impact Rapid proliferation through asexual reproduction and very little consumed by herbivores ; rapid expansion at the expense of native species such as posidonia, thus altering benthic assemblages and the entire associated ecosystem.

Distribution

PRESENT IN THE RAMOGE AREA



Census form :

- Observation site
- Abundance
- Distinctive features or markings

And take photos if possible !

Your observations matter !

Have you spotted a non-indigenous species ?

Species Factsheet

Portuguese man-of-war
Physalia physalis


doris.ffessm © Michel BARRABES

Living environment

The individual floats on the surface of the water.

Additional information

Origin: Atlantic, Red Sea, Indo-Pacific. *NB*: The organism drifts with the currents and winds, so it can be accidentally carried into the Mediterranean from the Strait of Gibraltar or the Suez Canal.

Commercial value : None.

Danger to humans : Its tentacles are highly venomous due to the presence of toxins, which can even be fatal. Since the tentacles can measure several meters in length, caution is essential.

Characteristics

Size : The float can measure 10 to 20 cm, and the tentacles can reach up to 50 m long.

Description : A colonial organism, a cousin of jellyfish as they belong to the same phylum, Cnidaria. It consists of an elongated, transparent float with a violet color, from which long and thin tentacles extend.

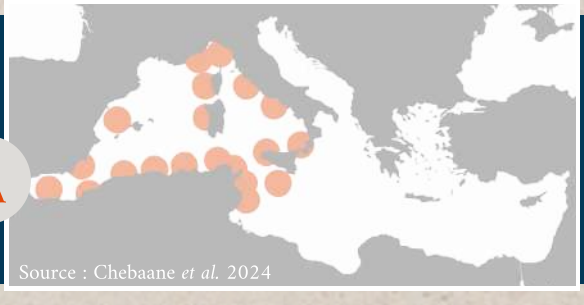
Diet : Carnivorous (small fish, possibly crustaceans, and other small planktonic animals).

Not to be confused with : The by-the-wind sailor (*Velella velella*), belonging to the same class as the Portuguese man-of-war, but very common in the Mediterranean and harmless to humans. The upper part is not a float but a disk topped with a sail, made of chitin.


doris.ffessm © Marie RAMM

Observations

ALREADY SEEN IN THE RAMOGE AREA


Source : Chebaane *et al.* 2024

Census form :

- Observation site
- Abundance

And take photos if possible !

FFESSM

CROMIS
CARNET DE RELEVÉS D'OBSERVATION DES MILIEUX SUBAQUATIQUES

DORIS
Données d'Observations pour la Reconnaissance et l'identification de la faune et la flore Subaquatiques

Gouvernement Princier
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ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale

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ECOSEAS
ECOLOGY AND CONSERVATION SCIENCE FOR SUSTAINABLE SEAS

UNIVERSITÉ CÔTE D'AZUR

cnrs

2024 Edition

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