Seas, Oceans & Public Health in Europe
Linking oceans and health research

The Ocean holds the secret for many medicines

WILDSEA EUROPE

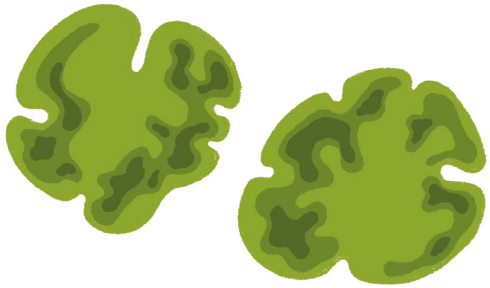
Marine biodiversity as a medicine provider

Space availability is a huge problem in the Ocean: many marine species are sessile (they cannot move and live fixed to a substrate), so they need to secure an empty spot to grow and a strategy to avoid predators. For this reason, many species have developed **chemical compounds to defend themselves against predators, compete for space, communicate with their "neighbours" or prevent *epibionts*** (organisms that live encrusted on the surface of other living organisms) **from attaching themselves to them.**

Chemical compounds are not exclusive to sessile organisms: many species with the ability to move also produce them, mainly for **defensive or preying purposes.**

Research on those chemical compounds and their properties has led us to many medical advances.

There are still many species yet to be discovered that may have potential essential medicinal properties.



Karenia brevis

> Is a harmful microalgae that produces potent neurotoxins and causes dangerous blooms (red tides).
> Used to treat cystic fibrosis.

Discodermia dissoluta

> Is a deep-water sponge.
> Used to treat lung and breast cancer.

Learn more at **www.teamupwithsophie.eu** and **sophie2020.eu**

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But... overgrowth of certain species may become a problem

Anthropogenic (man-made) impacts are changing Ocean conditions. This harms many species, but also benefits others that are more tolerant to change. When a species benefits from new environmental conditions, it overgrows due to the lack of competition and predators and can even become a serious problem. Two typical examples: phytoplankton and jellyfish.

Phytoplankton (plant-like plankton) **is the basis for marine life and the most important oxygen producer.** Its growth rates depend on factors such as temperature, salinity or nutrient availability. An **algal bloom** happens when a certain species of phytoplankton grows massively. Sometimes you can even see coloured patches in the Ocean. *Karenia brevis* blooms, for example, dye water a deep red, inspiring the name "red tide".

Phytoplankton blooms are a natural process, but they **can be magnified by nutrient input into the Ocean** (from agricultural or farming runoff and uncontrolled sewage), aggravating their negative effects. **Some phytoplankton species produce toxins that are potentially harmful to marine species and humans.** Their effects take place through direct water contact, ingestion, or consumption of marine organisms that have concentrated the toxins inside their bodies (especially filter feeders, such as mussels).

The **economic consequences** caused by these Harmful Algal Blooms are difficult to determine; they affect human health, commercial fishing and tourism. In Florida (USA), the tourism-related economic loss during HABs was estimated at approximately €2.5million/month for restaurants, and approximately €3.3 million/month for accommodations.

Jellyfish blooms are also becoming more frequent as Ocean conditions change. This growth in abundance seems to be related to anthropogenic impacts, such as overfishing (species that prey on jellyfish are being overfished) or global warming (jellyfish species may increase their reproductive output in warmer waters).

Jellyfish blooms also affect multiple sectors: fisheries, tourism and human health. A study on the impacts of jellyfish on tourism in Israel concluded that the number of visits were reduced by 3-10.5%, with a loss of €1.8-6.2 million.

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