The Black Sea

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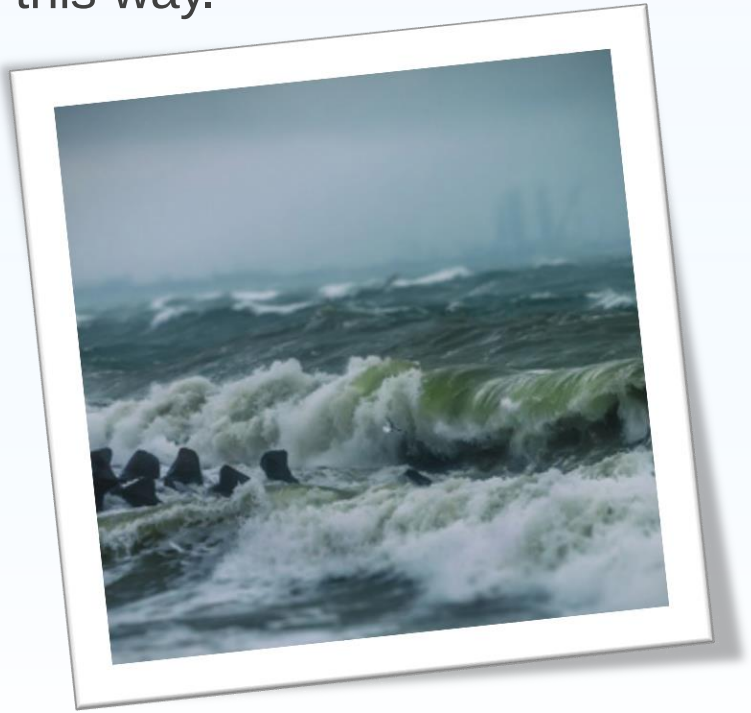
Why the **Black** Sea?

According to Rüdiger Schmitt the name comes form the Greek term Póntos(son of Geea) Áxeinos(dark object).

There are two theories as to why it is called this way.



General information

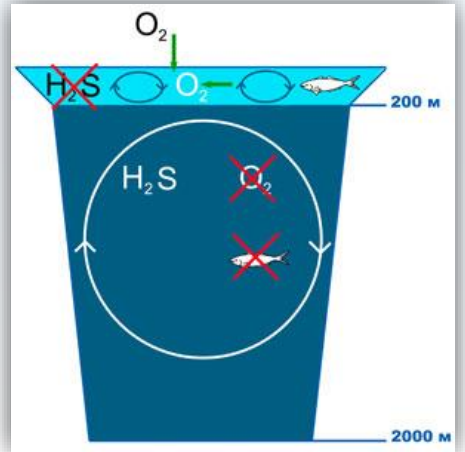
The Black Sea is a large body of water spanning from Eastern Europe to the Caucasus and Western Asia.

It is bordered by Ukraine to the North, Russia to the Northeast, Georgia to the East, Turkey to the South and Bulgaria and Romania to the West.

The Black Sea has an area of 436.400 Km^2.

It has a maximum depth of 2.212m.

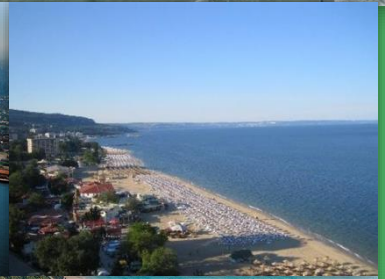
It has a volume of 547.000km^3- most of it is not suitable to sustain life.



The Black Sea is the largest body of water with a meromitic* basin.

*meromitic= where layersof water do not mix

A few important cities that are located on the coast of the Black Sea are Istambul(Tr), Samsun(Tr), Sevastopol(Ua) and Odessa(Ua).



Other important cities are: Năvodari (Ro), Constanţa (Ro), Batumi (Ge), Poti (Ge), Burgas(Bu), Varna(Bu).

Islands are scarce in the Black Sea and most of them are located in the North West.

The best known islands are: Snakes Island (Ua) (this is the largest island with a length of 440m, width of 660m and height of 60m), Snt. Anastasia Island(Bu) and Sacalin Island (created by the Danube).

Hydrology

The Black sea is classified as a **salt wedge estuary.**

The Black sea transfers water only with the Mediterranean Sea. The flow occurs in the Bosphorus and Dardanelles.

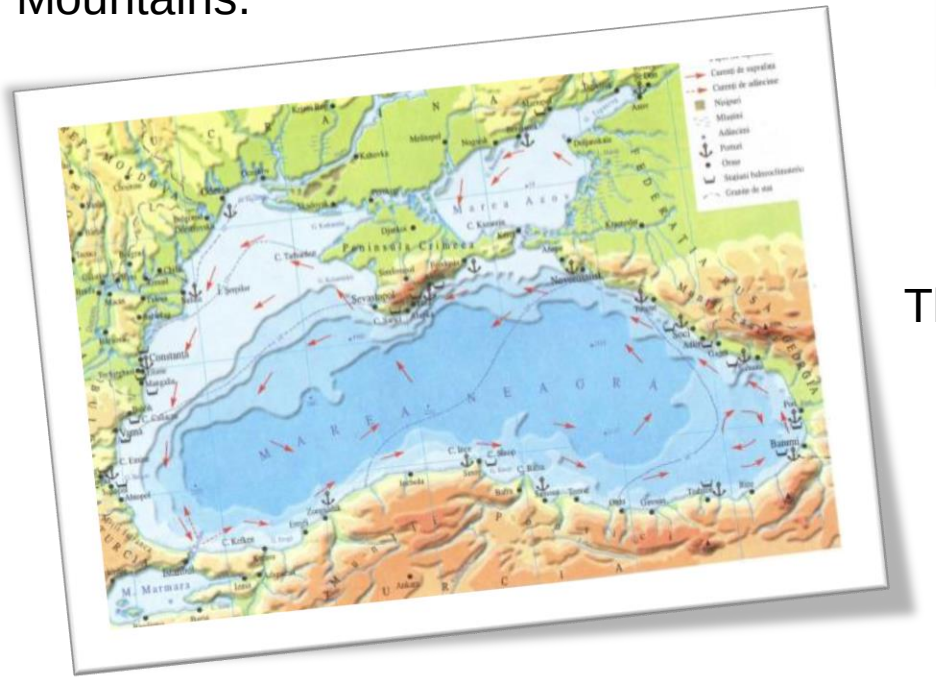
Inflow: from the Mediterranean Sea – dense , slaty water in the bottom of the basin –to the Black Sea

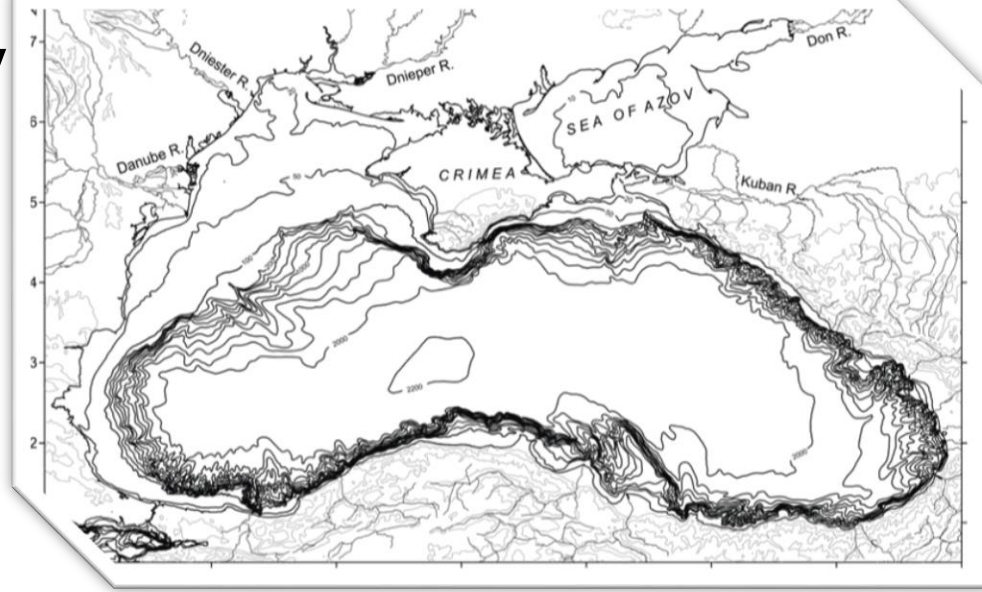
Outflow: from the Black Sea –less dense, oxigenated water –to the Mediterranean Sea.


Minsk
Berlin
Bonn
Leipzig
Warsawa
BELARUS
POLAND
GERMANY
RUSSIAN FEDERATION
Prague
Krakow
Lviv
Kyiv
Kharkiv
UKRAINE
Munich
Brno
Vienna
SLOVAKIA
Dniepropetrovsk
Bratislava
Innsbruck
AUSTRIA
Graz
Budapest
Rostov
MOLDOVA
Mariupol
Cluj
HUNGARY
SLOVENIA
Chisinau
Odessa
Azov sea
Zagreb
CROATIA
ROMANIA
Crimea
Belgrade
Novorossiysk
Sevastopol
BOSNIA-HERZEGOVINA
Bucharest
Constanta
Adriatic Sea
YOUGOSLAVIA
Black Sea
Sukhumi
GEORGIA
Poti
Burgas
Samsun
Trabzon
Istanbul
Naples
Tirana
Thessaloniqué
Ankara
Milan
Venezia
Florence
Rome
Sofia
Erzurum

The black Sea's topography

Southern and Eastern coastlines are of a higher altitude due to the Pontic Mountains and the Caucas Mountains.





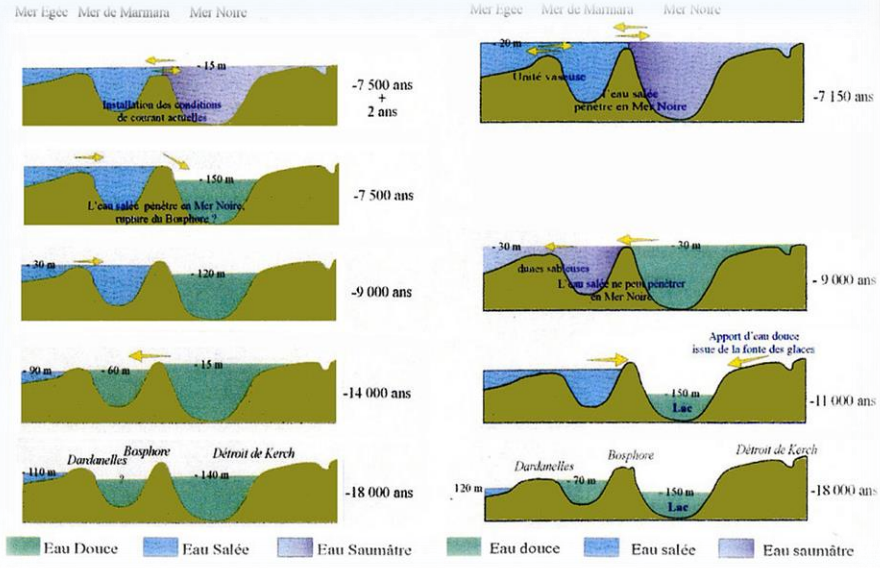
There are 4 distinct regions based on deapth:

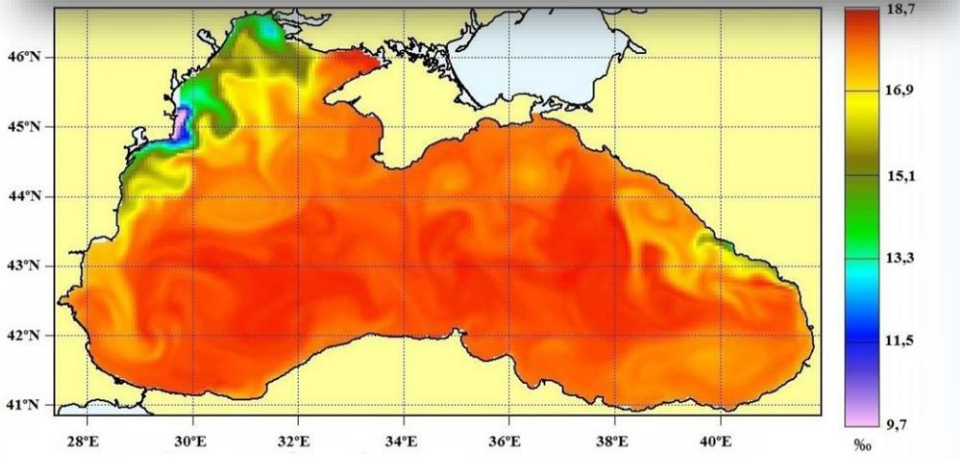
-Şeful(30%)
-Taluzul(28%)
-Piemontul(30%)
-The abyssal plain(12%)

Salinity

The surface level has a salt concentration of about 17-19/1000.

The deeper levels have a higher salt concentration that can go up to 38-39/1000.





Oil and natural gas

The Black Sea has significant oil and gas forming potential. This is mostly due to the inflow of nutrient rich waters. Most descoveries that have been made on this topic took place in Romania.

OMV Petrom is the biggest company of energy in the South East of Europe. It has over 12.000 employees and has a profit of over 30 billion euro.

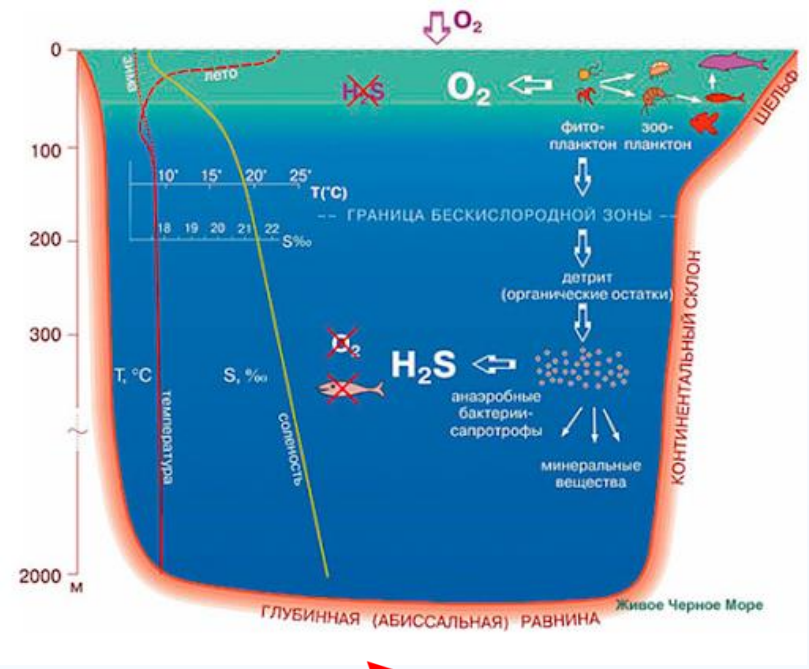
OMV Petrom

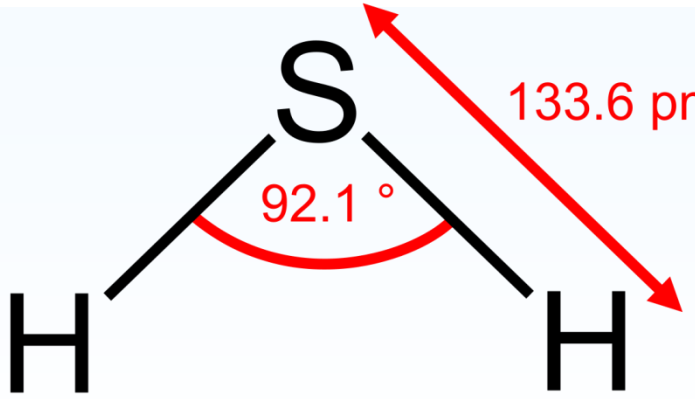
Life in the Black Sea

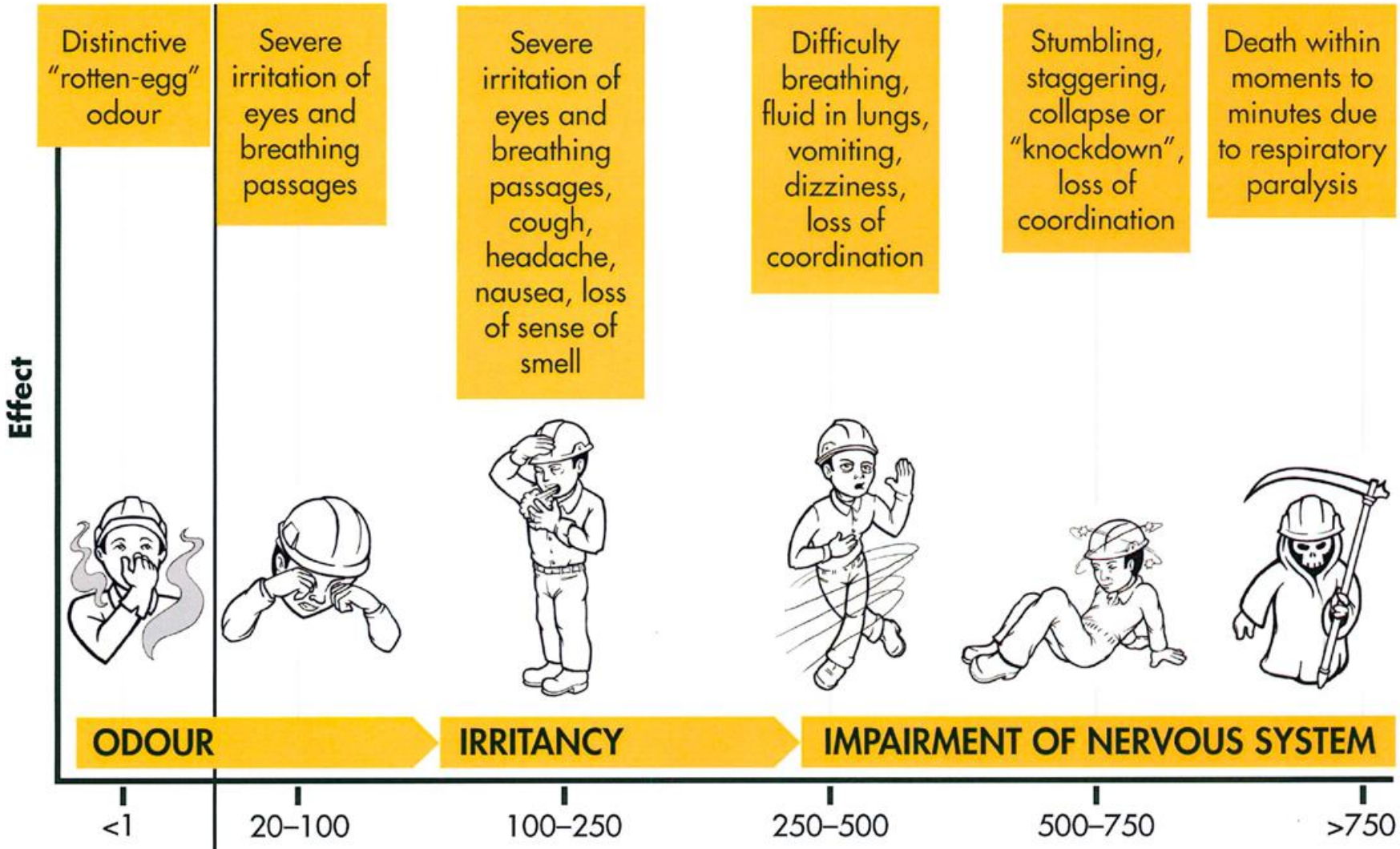
General information

Even though the Black Sea's biodiversity isn't that high, it still has an unique and complex ecosystem.

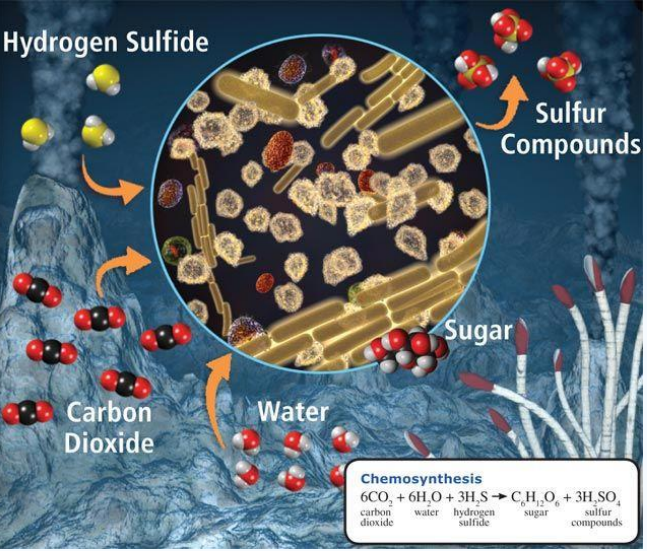
85-90% of the Black sea is vitrually uninhabitable. The only life forms there live under 150-200m and are **chemosynthetic bacteria**.






Distinctive "rotten-egg" odour
Severe irritation of eyes and breathing passages
Severe irritation of eyes and breathing passages, cough, headache, nausea, loss of sense of smell
Difficulty breathing, fluid in lungs, vomiting, dizziness, loss of coordination
Stumbling, staggering, collapse or "knockdown", loss of coordination
Death within moments to minutes due to respiratory paralysis
Effect
ODOUR
IRRITANCY
IMPAIRMENT OF NERVOUS SYSTEM
<1
20–100
100–250
250–500
500–750
>750

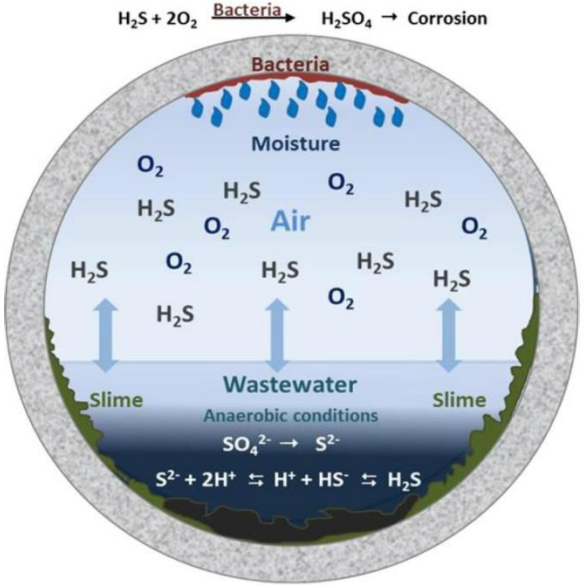
Bacteria

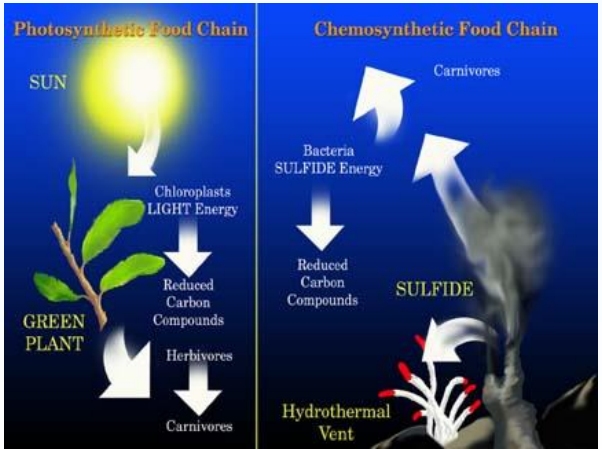


What is chemosynthesis?

$2H_2S + O_2 \rightarrow 2S + 2H_2O + 122.2kcal$

$S + 2H + 2O_2 = 284.4kcal + H_2SO_4$





Macroscopic life

Plants

They are predominantly photosynthetic eukaryotes. Algae and fun gi are **NOT** plants. They obtain their energy from sunlight via photo synthesis by transforming carbon dioxide and water into glucose.

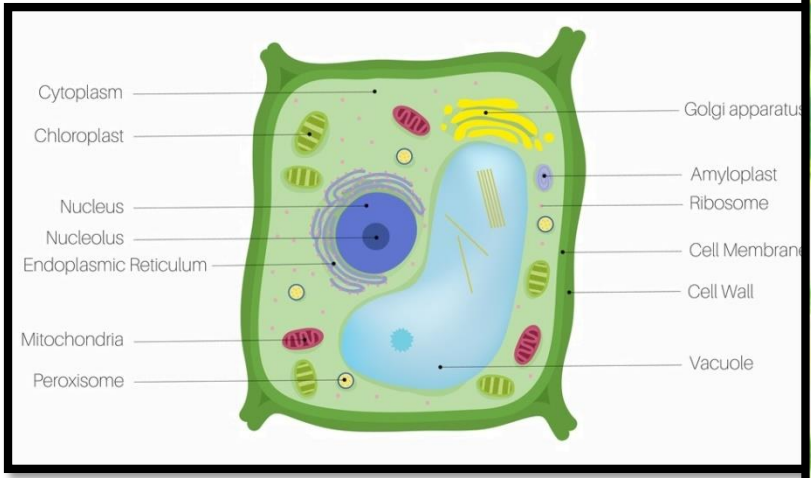
invertebrates

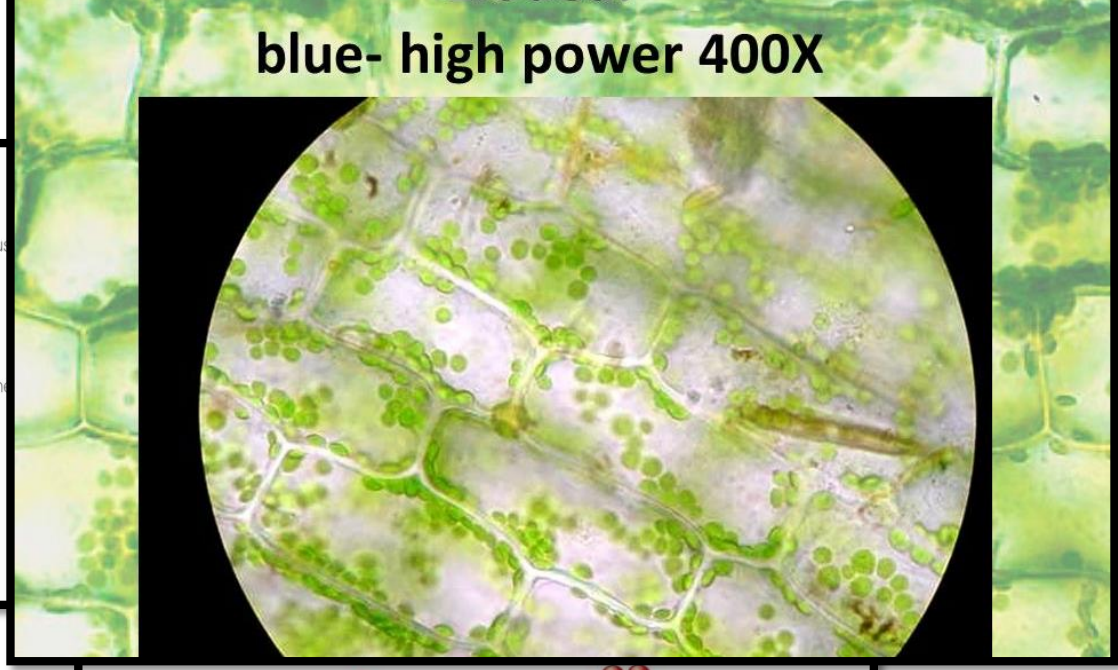
Together with vertebrates they form the Animalia kingdom. Most of them have an outer exoskeleton used either for protection or for digesting food. They are less evolved than vertebrates.

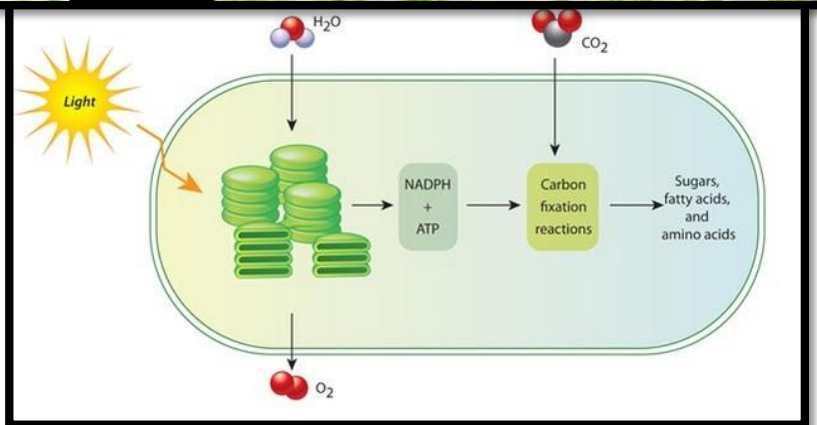
vertebrates

The newest class of animals. They have bones/ cartilage inside th eir bodies that are mainly used for protection. Fish, amphibians, re ptiles, birds and mammals form the vertebrate ***subphylium.***

Plants


Cytoplasm
Chloroplast
Nucleus
Nucleolus
Endoplasmic Reticulum
Mitochondria
Peroxisome
Golgi apparatus
Amyloplast
Ribosome
Cell Membrane
Cell Wall
Vacuole

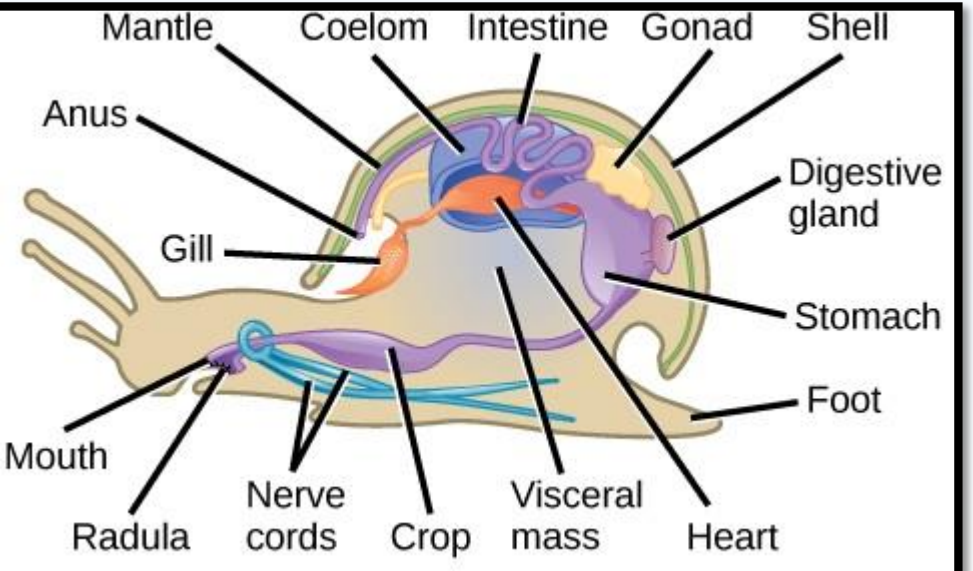

blue- high power 400X

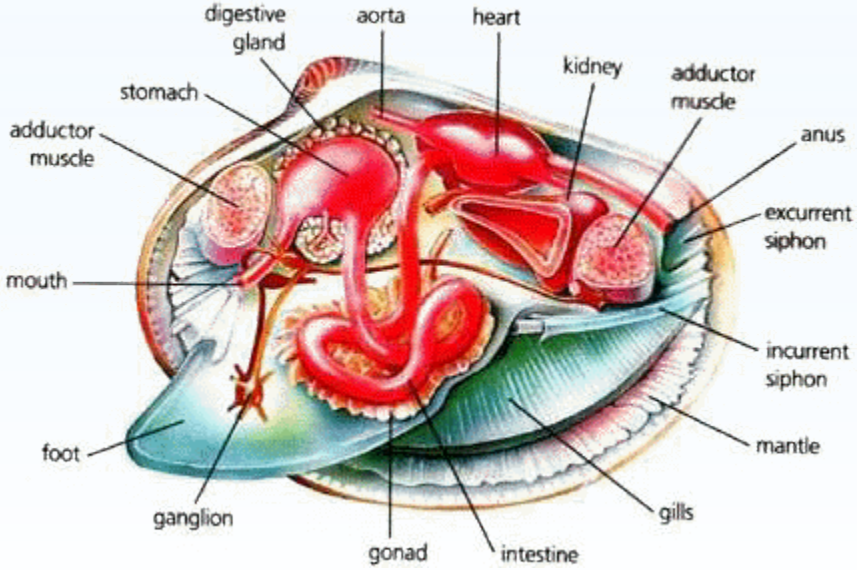

H_2O
CO_2
Light
NADPH + ATP
Carbon fixation reactions
Sugars, fatty acids, and amino acids
O_2

Molluscs

They are animals whose bodies are soft and smooth (mollis=soft).

Their bodies are not segmented but but they can be separated in 3 parts. The head, the leg and the internal organs





It has one of the most beautiful shells in the Black Sea.
They are 8-9 mm long.

They can be found up to 25-30m underwater.
They feed of organic residues that lay in the sand.

They grow up to 43 mm in length and 13 mm in diameter.
They have from 8 up to 10 springs on their shell.

They live as deep as 80m underwater, in rocky or sandy environments.

It is an invasive species brought from India into the Black Sea by accident 1980.

It is one of the most resistant gasteropodes out there, thriveing even when the oxigen levels are low.

Crustacians


Diogenes Pugilator


Evadne Spinifera

They are arthropods whose bodies are composed out of the head, cephalothorax and the abdomen.

Their shell is chitinous and they are usually aquatic animals.


Liocarcinus Navigator

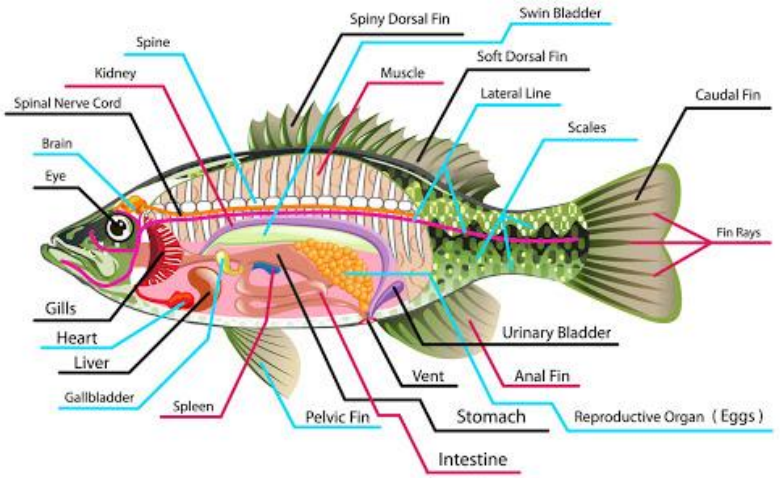
It has Atlantico-Mediteranean origins.
In 1924 it was recognised as an official species of the Black Sea and they can be found on the coast of Bulgaria.
It is one of the rarest species in the Black Sea and they live at depths of 40-60m.

It is the most common shrimp in the Black Sea.
Females have 55-60mm in length and males are shorter.
During winter they migrate deeper into the sea, reaching depths of 35 to 45m.

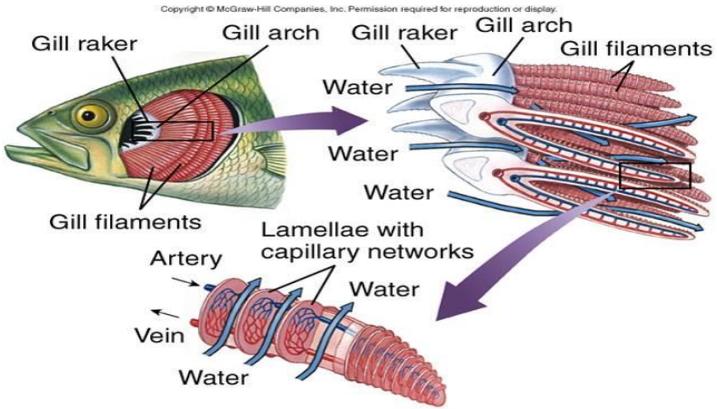
They are originally from the Sea of Japan and they have been brought by the Soviet Union in 1959.
They weigh around 13 to 14g and they can reach 130mm in length.

Fish


Acipenser Gueldenstaedtii


Spiny Dorsal Fin
Swin Bladder
Spine
Soft Dorsal Fin
Kidney
Muscle
Lateral Line
Caudal Fin
Spinal Nerve Cord
Scales
Brain
Eye
Fin Rays
Gills
Urinary Bladder
Heart
Liver
Vent
Anal Fin
Gallbladder
Spleen
Pelvic Fin
Stomach
Reproductive Organ (Eggs)
Intestine


Alopias Vulpinus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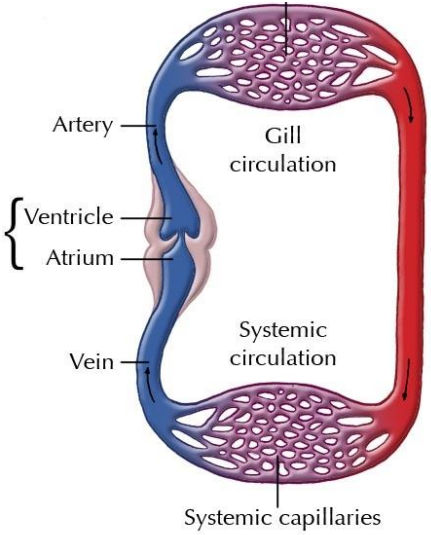
Gill raker
Gill arch
Gill raker
Gill arch
Gill filaments
Water
Water
Water
Gill filaments
Lamellae with capillary networks
Artery
Water
Vein
Water


Artery
Gill circulation
Ventricle
Atrium
Systemic circulation
Vein
Systemic capillaries

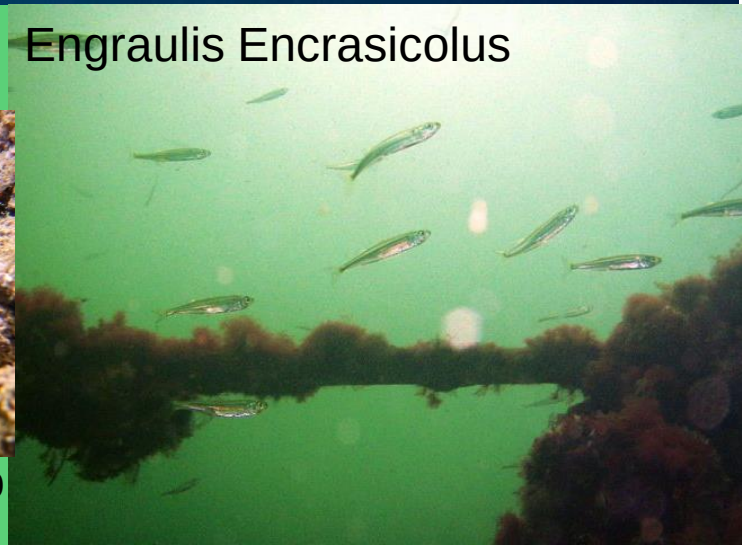
Scyliorhinus Canicula

Sphyrna Zygaena

Hippocampus Guttulatus

Platichthys Flesus

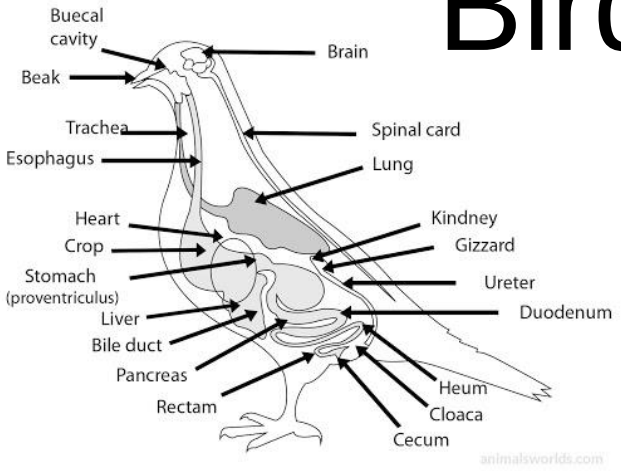
Blennius pavo Risso



Engraulis Encrasicolus

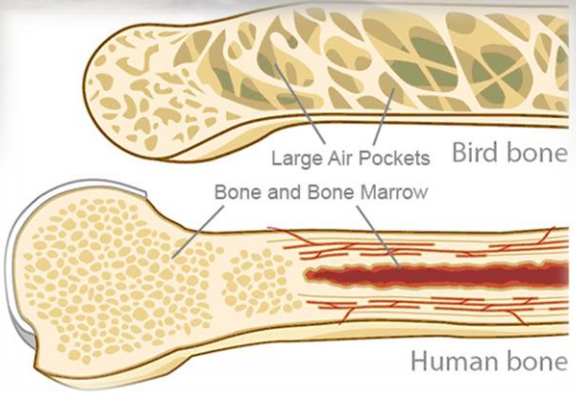
Anguilla Anguilla

Birds




Haliaeetus Albicilla


Larus Cachinnans



Puffinus Puffinus

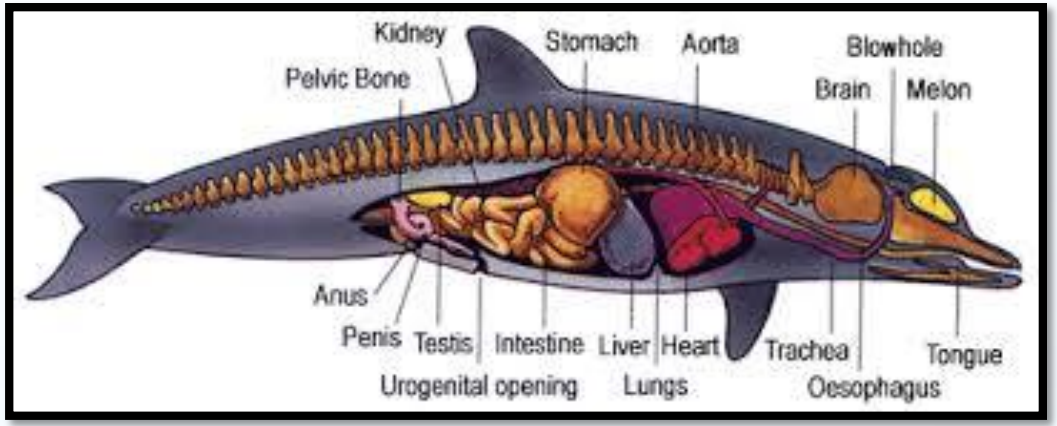
Branta Ruficollis

Larus fuscus Linnaeus

Larus Melanocephalus

Sterna Hirundo

Mammals

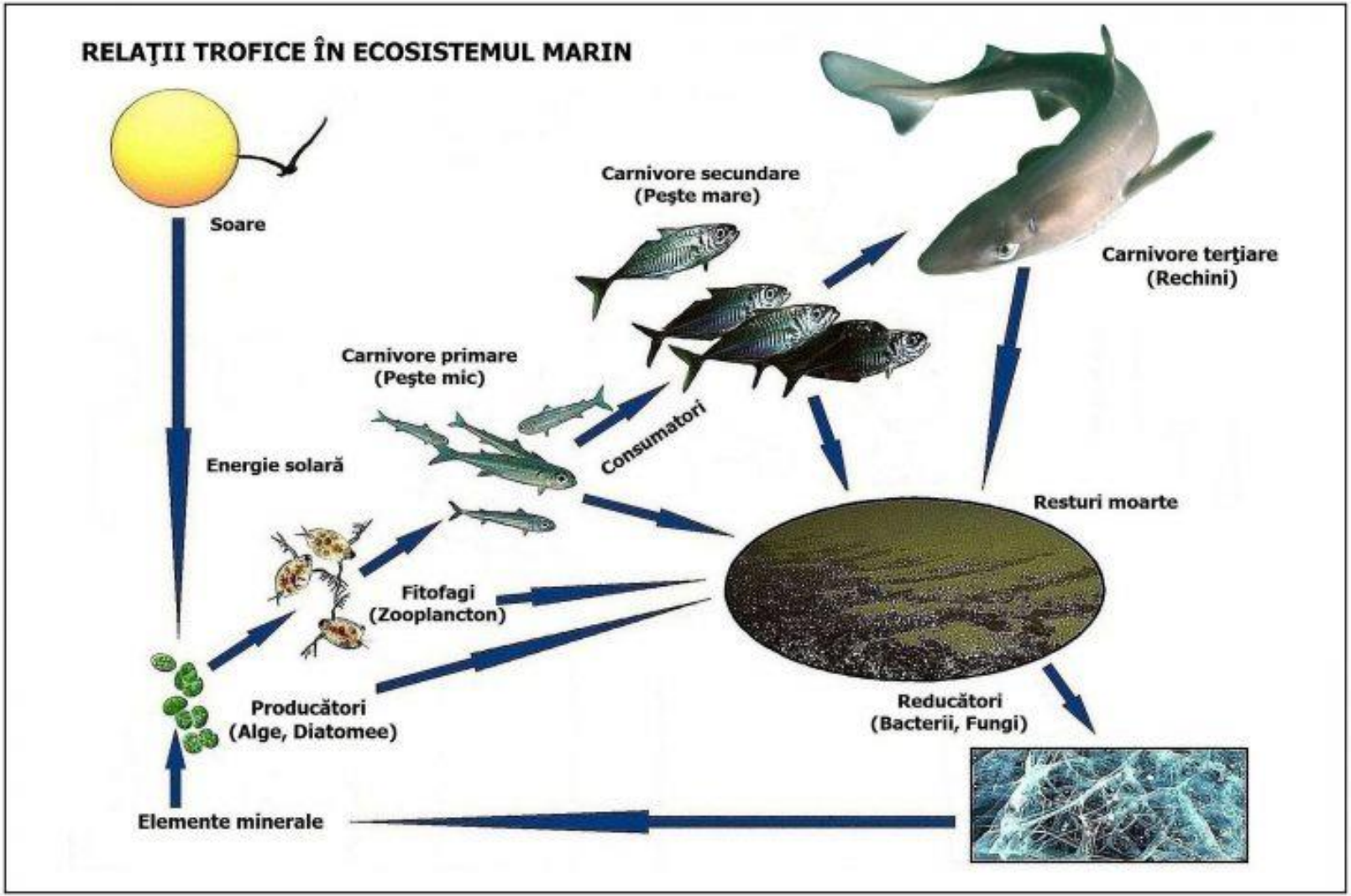

Kidney
Stomach
Aorta
Blowhole
Pelvic Bone
Brain
Melon
Anus
Penis
Testis
Intestine
Liver
Heart
Trachea
Tongue
Urogenital opening
Lungs
Oesophagus


© Chicago Zoological Society


Tursiops Truncatus


Phocoena Phocoena

THE ECOSYSTEM



PRODUCER

PRIMARY CONONSUMER

APEX PREDATOR


Marea
Neagra

Polution

Biography

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I. Alexandrescu
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