



MICROALGAE BIOMASS AS A SUSTAINABLE FOOD SOURCE
anabraymundo@isa.ulisboa.pt

UNIVERSITY OF LISBON
INTERDISCIPLINARY STUDIES
ON SUSTAINABLE ENVIRONMENT AND SEAS



SESSION I - General aspects: what microalgae are their impact on the planet, as major oxygen producers

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SUMMARY

What are microalgae?

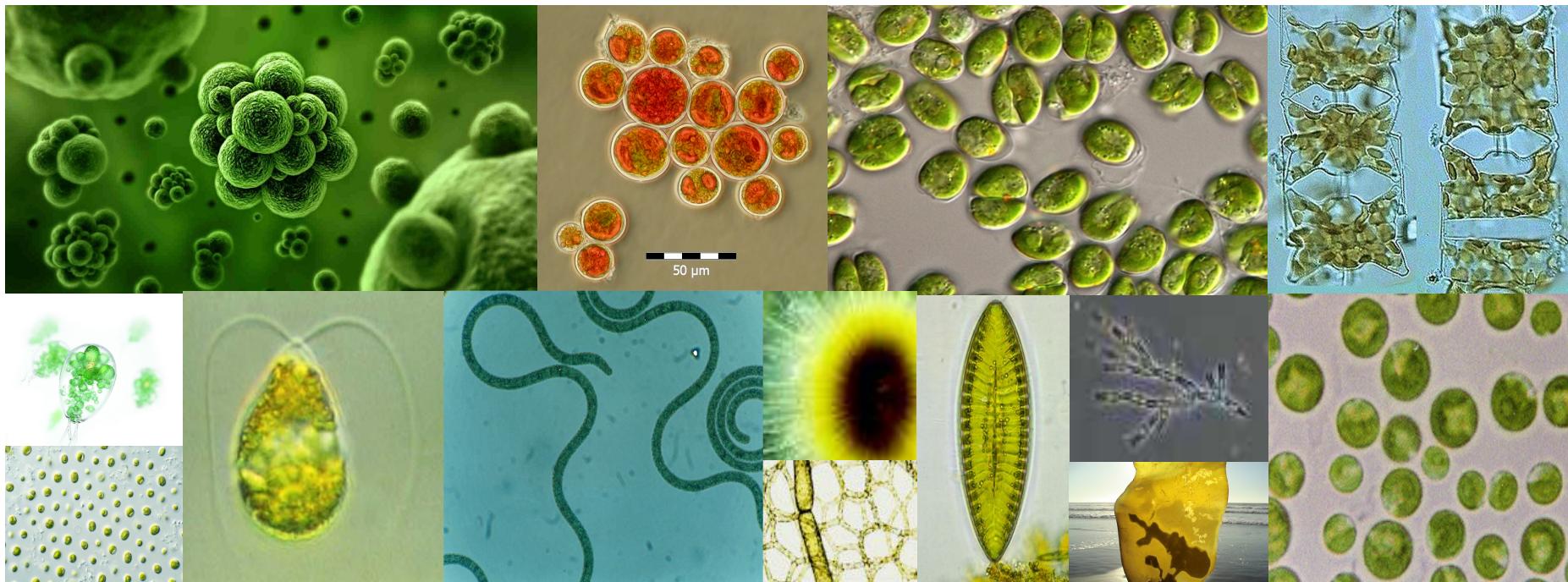
From the microalgae to seaweed

Phytoplankton – the first step in the aquatic food chain

Microalgae has oxygen producers and its contribution to CO₂ mitigation

What are microalgae?

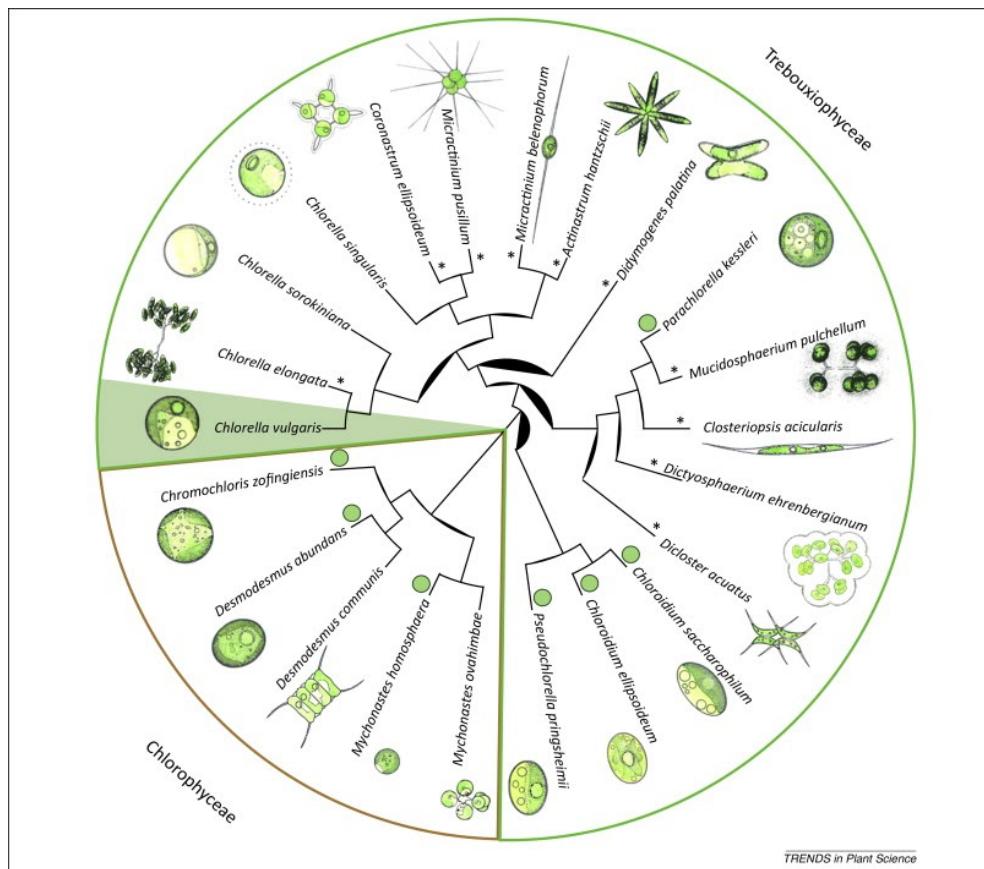
A fabulous microscopic world...



There are thousands of species around the world, only a small number is identified and only four are allowed in human food.

But they are really beautiful, in terms of colours and shapes and colours!!!!

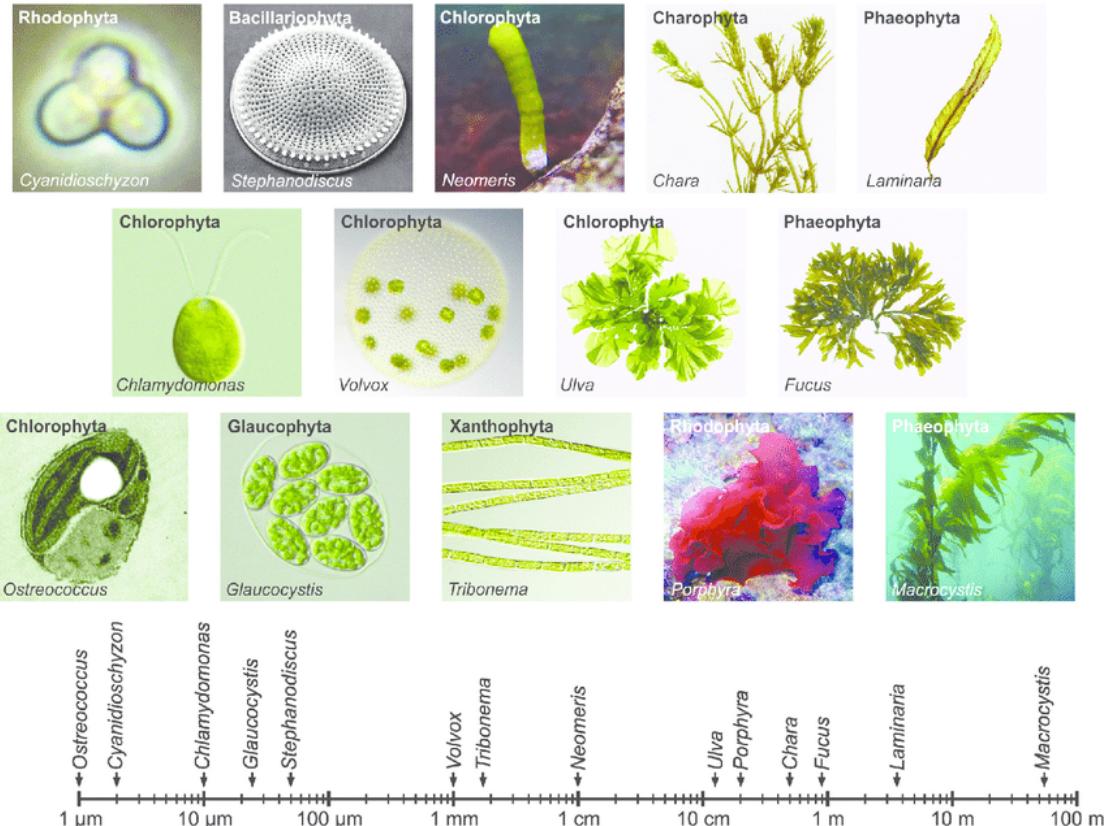
These microscopic beings are at the base of the food chain.



A complex family...



From the microalgae to seaweed



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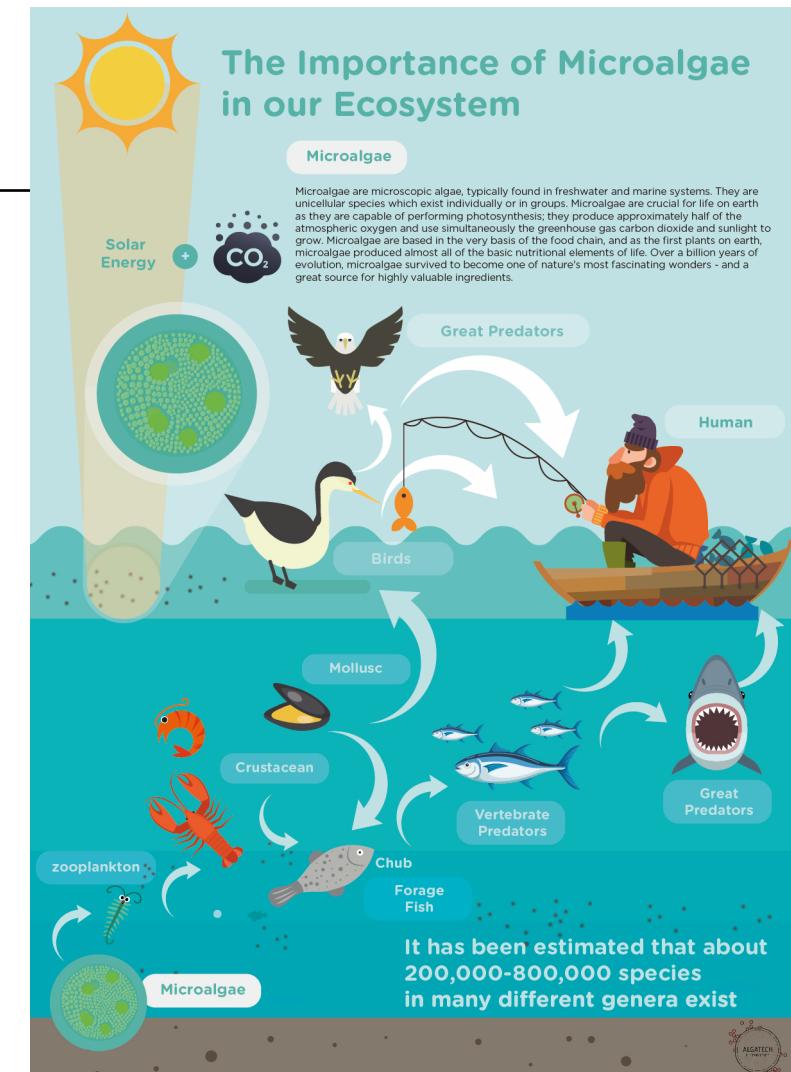
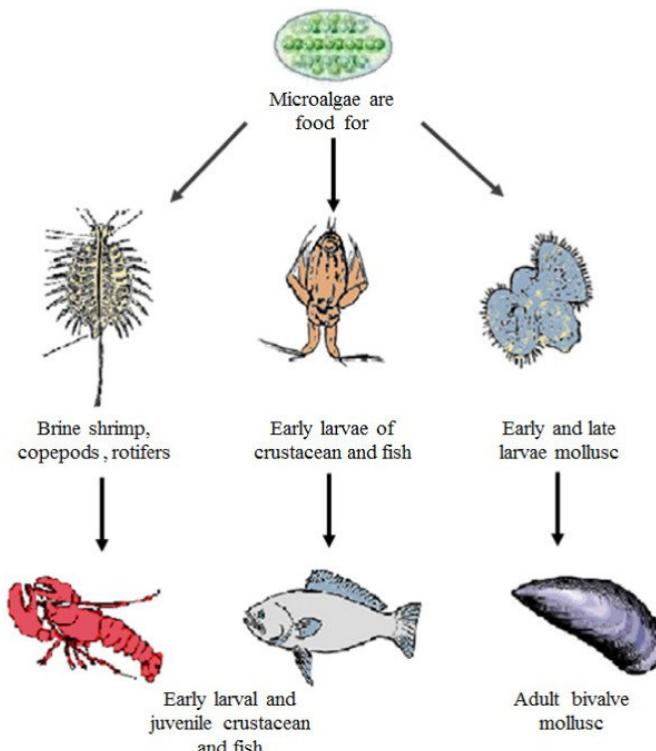
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Phytoplankton – the first step in the aquatic food chain

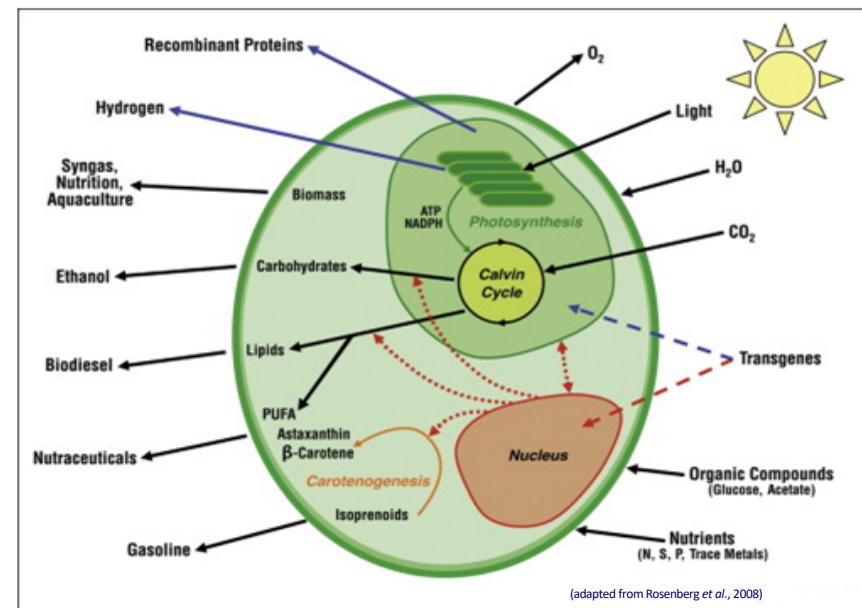
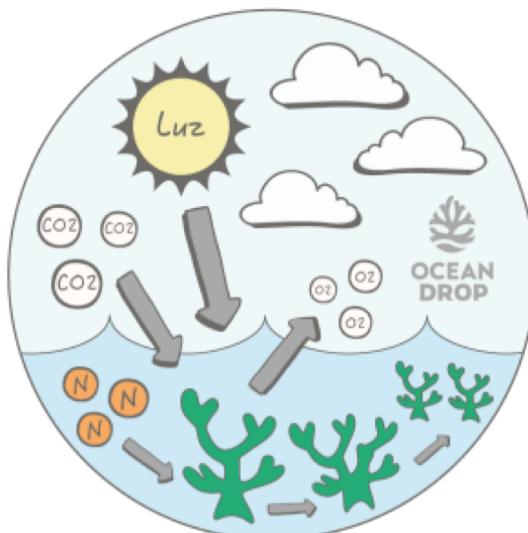


Microalgae has oxygen producers and its contribution to CO₂ mitigation

Microalgae: source of naturally encapsulated bioactive compounds

Photosynthetic unicellular organisms used for thousands of years as a natural food or for medicinal purposes

They have an important role on CO₂ mitigation



Microalgae has oxygen producers and its contribution to CO₂ mitigation

Microalgae represent a diverse group of plant-like, unicellular organisms. It is estimated that about 300 000 different species exist on earth. Around 40 000 species are actually described and a few are analysed in detail.

"Microalgae" includes prokaryotic cyanobacteria as well as eukaryotic microalgae species capable of growing in presence of **sea water (e.g. oceans), fresh water (e.g. lakes, rivers)** and on several kinds of ground surfaces (e.g. soil).

Microalgae, are called phytoplankton since they are small plant-like organisms between **1-50 micrometres** in diameter without roots or leaves.

Together with the seaweeds (macroalgae or large aquatic plants), microalgae are part of the **aquatic biomass and they are basis for most food chains**.

Most species contain chlorophyll, use sunlight as an energy source and convert carbon dioxide (CO₂) into biomass - photosynthesis process to produce oxygen (O₂).

On a global scale microalgae produce more than 75% of the oxygen required for animals and humans.

<http://www.algaeparc.com/about-algae>

Microalgae: not only in the ocean...



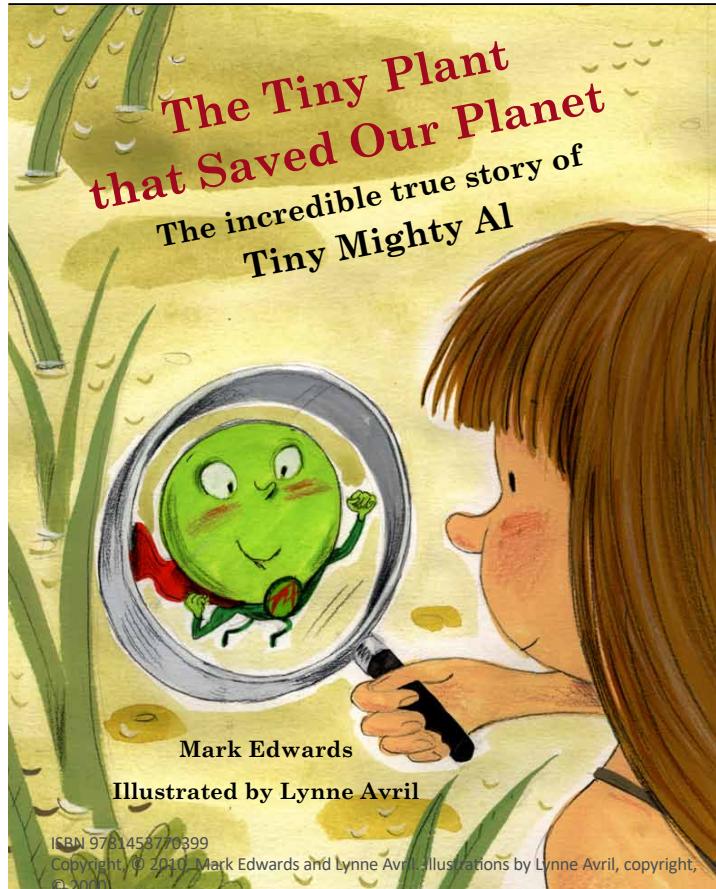
Snow; watermelon snow

salt flats *Dunaliella salina*



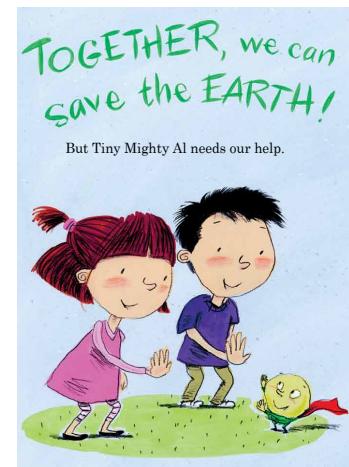
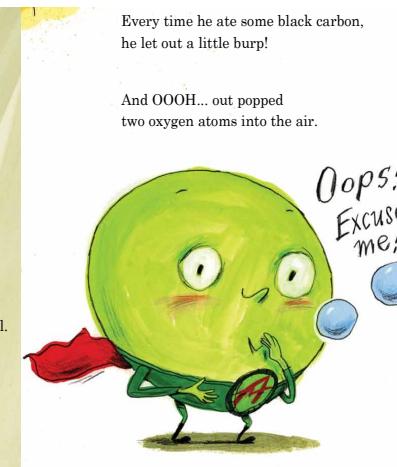
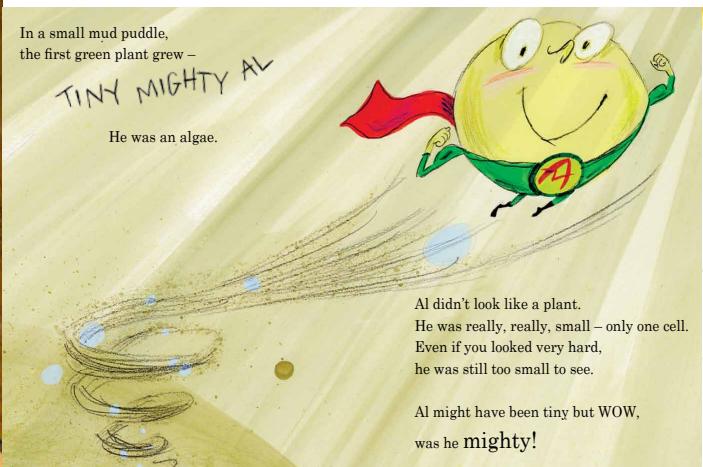
Lakes

Non arable land



The preservation of microalgae and their use as a new crop is essential for the future and it must be shared with the youngest generations...

Can I introduce you to Tiny Mighty Al's story?



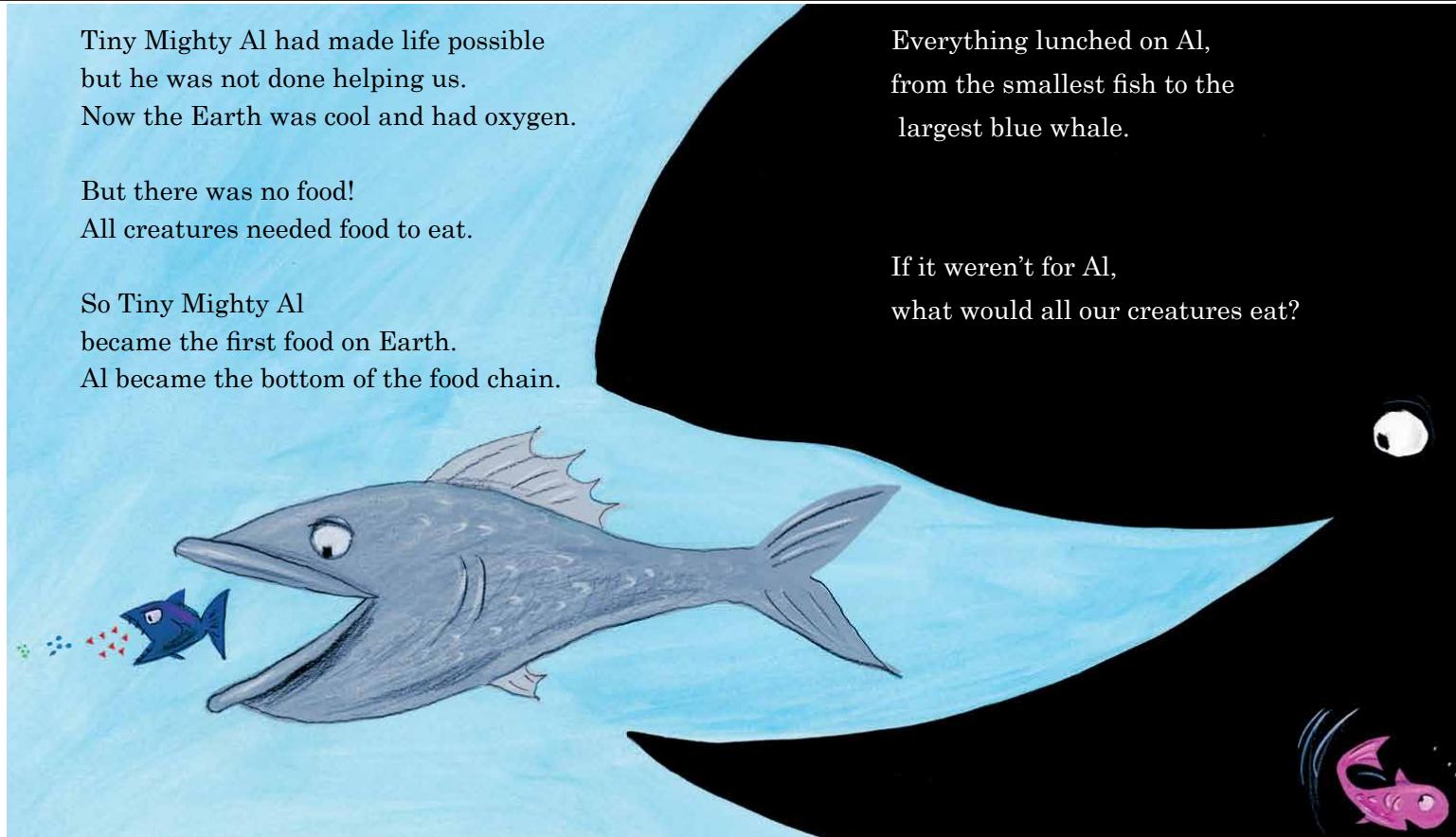
Tiny Mighty Al had made life possible
but he was not done helping us.
Now the Earth was cool and had oxygen.

But there was no food!
All creatures needed food to eat.

So Tiny Mighty Al
became the first food on Earth.
Al became the bottom of the food chain.

Everything lunched on Al,
from the smallest fish to the
largest blue whale.

If it weren't for Al,
what would all our creatures eat?



Messages to take home

There is a huge diversity of microalgae and many species are not yet explored.

Microalgae are a marine resource with a high potential for exploitation, being the first element of the aquatic food chain.

Microalgae are excellent oxygen producers, being a key element in the mitigation of atmospheric CO₂, contributing to minimize climate change.

The background of the image is an underwater scene. At the surface, there is a large, partially melted plastic bag and several plastic bottles. Below the surface, a green sea turtle swims gracefully. In the background, a school of small fish swims away. The water is a deep blue, and the overall atmosphere is somber, highlighting the issue of plastic pollution in the ocean.

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