

What are corals?

Corals are marine invertebrates, animals without a backbone, that are related to anemones and jellyfish. Hard or hermatypic corals create calcium carbonate skeletons and primarily build reefs. They are found in tropical regions. Soft or ahermatypic corals, that are often brightly colored, do not build these skeletons, but spiky structures, called spicules. They do not build up reefs, but can inhabit coral reefs. They can be found worldwide and resemble grasses or bushes. With their tentacles some corals capture their own food. Most hard corals host the microscopic unicellular algae called zooxanthellae in their tissues. This algae takes the coral's metabolic waste products and carries out photosynthesis providing the produced organic material as food to the corals. Due to the need of sunlight, they are restricted to shallow water.

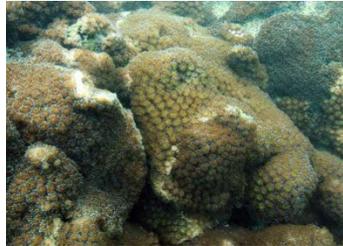
Why are they important?

Corals provide habitats for marine species by offering food, shelter and breeding sites. Corals also form a barrier along coasts and around islands offering shoreline protection by dissipating wave energy and minimizing coastal erosion. As filters coral reefs help to improve water quality. Coral

Corals around Hainan island

The coral abundance along the Chinese mainland and Hainan island has declined by at least 80 % over the past 30 years.

Galaxea fascicularis



Acropora tenuis



Montipora digitata



Seriatopora hystrix



Porites lutea



Podabacia crustacean



Photos: H. Zhao, Y. Wang

reefs play a role in managing carbon dioxide levels. They also support fishing and tourism industries as reefs are famous attractions. As sources of new medicines to treat cancers and other illnesses, coral reefs have huge pharmaceutical values and are referred to as medicine chests of the sea.



What are the threats?

Currently, three-quarters of the coral reefs worldwide are at risk and 50 % of them could be destroyed by 2030.

Corals are threatened by various sources including natural processes and human activities:

- Natural events such as storms
- Climate change, associated with increased water temperatures, elevated light levels, and sea level rise
- pH changes through ocean acidification
- Dredging, coral mining, vessel damage
- Agricultural and urban runoff increasing nutrients, herbicides, sediment load and turbidity
- Organic pollutants, oil spills, marine debris such as microplastics
- Overexploitation, overfishing, blast fishing
- Invasion of carnivorous starfishes
- Diseases including black-band, white-band, and yellow-band diseases



Coral bleaching

In the recent years, the frequency of coral bleaching events has increased. In 2016, about 36 % of corals reefs worldwide have experienced major bleaching.

When corals are stressed, they temporarily or permanently dispel the zooxanthellae that also give them much of their color. Without zooxanthellae, these corals turn white and start to starve. If the stress persists, bleached corals can even die.



Bleaching corals in Hainan

Further interesting facts

- Each individual coral is called a polyp.
- Most of the larger coral reefs that we find today are estimated to be between 5,000 and 10,000 years old.
- Reefs compete rainforests in the amount of biodiversity they support. They cover less than 1 % of the ocean floor, but host 25 % of marine species.

Interesting links

<https://coralreef.noaa.gov/education/coralfacts.html>
<http://www.pcrf.org/reeffacts.php>
<https://www.icriforum.org/about-coral-reefs/what-are-corals>

References

Henkel 2010. *Nature Education Knowledge* 3 (10): 12.
 Hughes et al. 2013. *Conservation Biology* 27: 261-269.
 Hughes et al. 2017. *Nature* 543: 373-377.