FACT | SHEET



CORALS in Hainan, China

Corals are marine invertebrates (animals without a backbone) related to anemone and jellyfish. Corals are found worldwide and are of high importance in many ways, for example as habitat for marine organisms, natural barrier that offers shoreline protection, tourist attraction or as filter that improves water quality. However, 75% of the coral reefs worldwide are at risk. They are threatened by extreme weather events and human activities resulting in, e.g., pollution, coral mining, bioinvasion and diseases.



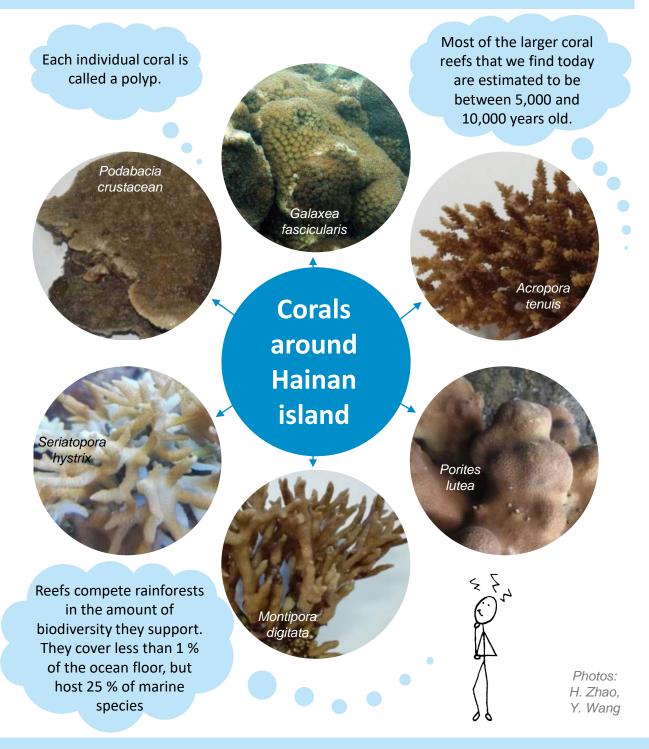
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FACTS

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



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

Hughes et al. 2017. Coral reefs in the Anthropocene. Nature 546: 82–90. Xiang et al. 2018. Occurrence and distribution of Polycyclic aromatic hydrocarbons (PAHs) in seawater, sediments and corals from Hainan Island, China. Ecotoxicology and Environmental Safety 52: 8-15

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 processes and human activities:

- Extreme weather events such as storms:
- Climate change, associated increased water temperature, elevated light levels, and sea level rise;
- changes through ocean acidification;
- Agricultural runoff and urban herbicides, increasing nutrients. sediment load and turbidity;
- Organic pollutants, oil spills, marine debris such as microplastics. Our study in Hainan has found that PAH (polycyclic aromatic hydrocarbon) concentrations value in corals markedly higher than in ambient seawater and sediments.

Coral bleaching

In 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 temporary 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

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

Take home messages

- → Corals are marine invertebrates. Hermatypic corals primarily build reefs, while ahermatypic can inhabit them
- → As hotspots of marine biodiversity, shoreline protectors, water filter or source of income for tourism and fishing industry, corals strongly benefit society and the environment
- → Many factors like increased water temperature. acidification, pollutants, overfishing or coral mining pose serious threats to corals and have already put 75% of the worlds reefs at risk





