

## Teaching Material on Biodiversity Conservation (TMBC)

<b>Title:</b>	Tropical coral reef
<b>Author:</b>	Ann-Sophie Zimdars
<b>Quality Assessment:</b>	Carsten Hobohm (UF)
<b>Level:</b>	Secondary School
<b>Type of material:</b>	Illustrations for the topics "reef types", "food web", "symbiosis" and "hazard"
<b>Needed media:</b>	PC and projector or OHP
<b>Aim:</b>	Recognition of the basic and special structures of <i>tropical coral reefs</i> and the threats they face

### Approach:

The illustrations are projected onto a wall by beamer or overhead projector or alternatively may also be handed out to the learners.

Pupils are first confronted with these images. No prior knowledge of the topic is needed. They describe what they see and in this way they explore the topic of *Tropical coral reefs*.

Alternatively, the images can be discussed in group work. To consolidate the results, some research on the internet or in literature is recommended.

Following the description by several pupils the topic is explained by the teacher. The topics could be talked about in a class discussion.

### Information for the teacher:

Tropical coral reefs occur mainly at latitudes of 30 ° south and north, where the water temperature is constantly above 20 ° C and below 30 ° C, the temperatures preferred by the corals.

Madrepore (*Scleractinia*) are the main builders of coral reefs. There are four different kinds of reef types: fringing reefs, barrier reefs, platform reefs and atolls.

Symbiosis is a particularly important feature in the ecosystem of the tropical coral reefs. The corals live in symbiosis with unicellular algae called zooxanthellae. The zooxanthellae carry out photosynthesis and thus provide the coral with sugar. In return they receive minerals and CO<sub>2</sub> from the coral. Without the symbiosis the CO<sub>2</sub> would attack the lime layer of the corals.

The goby and the snapping shrimp represent another symbiosis. The goby protects the almost blind shrimp and in return is allowed to live in the fish's cave. Sea anemones (*Actiniaria*) and clownfish (*Amphiprion*) are another example of symbiosis, mutual protection.

Coral reefs are currently threatened. In some areas the coral is used as building material. Pollution affects the water quality and divers also represent a danger for reefs.

Another problem is coral bleaching, which occurs as a result of a permanent increase in water temperature. Here, the essential zooxanthellae are expelled by the coral. As a result, the coral dies and fades. Only the calcium structure remains.

**Important organisms:**

- Clownfish (*Amphiprion*)
- Goby (*Gobiidae*)
- Madrepore (*Scleractinia*)
- Sea anemone (*Actiniaria*)
- Snapping shrimp (*Alpheus*)
- Zooxanthellae

**References:**

Blue Water Dive Resort (2014): Reef Exhibition – Hurghada / Red Sea Egypt ([http://www.blue-water-dive.de/en/reefeducation\\_en.php](http://www.blue-water-dive.de/en/reefeducation_en.php); downloaded 10.02.2014)

Wikipedia (2014): Coral reef – ([http://en.wikipedia.org/w/index.php?title=Coral\\_reef&oldid=594413392](http://en.wikipedia.org/w/index.php?title=Coral_reef&oldid=594413392); downloaded 10.02.2014)

Wikipedia (2014): Symbiodinium – (<http://en.wikipedia.org/w/index.php?title=Symbiodinium&oldid=592971964>; downloaded 10.02.2014)