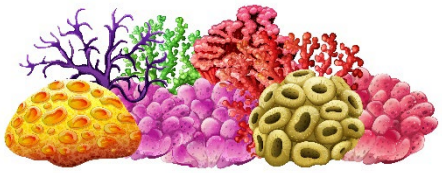


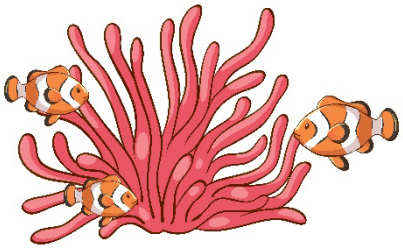
Bachelor Project Announcement

Exploring symbiont change as a mechanism for increased heat tolerance in hard corals

Reef-building corals thrive in oligotrophic waters due to their dynamic multifunctional microbiome. Particularly, the endosymbiotic dinoflagellates of the family Symbiodiniaceae supply the coral holobiont with 75-100% of its daily carbon requirements. However, increasing ocean temperatures lead to the breakdown of the coral-dinoflagellate relationship and subsequent symbiont loss, a process known as coral bleaching. The loss of symbionts halts the supply of photosynthates, increasing the risk of starvation and coral death. The family Symbiodiniaceae is highly diverse, and while some symbiont species support faster coral growth under normal conditions, others confer increased tolerance to heat stress. Therefore, manipulating the symbiont composition within coral holobionts may be an opportunity for corals to withstand heatwaves in a warming ocean.

The overall objective of this project is to identify the physiological and ecological mechanisms driving symbiont change in hard corals. Coral colonies (*Montipora digitata* or *Stylophora pistillata*) will be exposed to a high temperature and subsequently inoculated with a Symbiodiniaceae strain not previously associated with the host. These experiments will allow us to determine (i) to what extent the composition of the symbiont community shifted, (ii) whether this shift was towards the added dinoflagellate strain (indicating external acquisition) or not (indicating internal shuffling), and (iii) if changes in symbiont composition affected the eco-physiological performance of the corals, indicating potential trade-offs.

Bachelor students interested in this project should be motivated, responsible, and interested in conducting manipulation experiments in aquarium facilities and measuring eco-physiological response parameters in corals. Students should be able to work as part of a team under supervision, while also demonstrating the ability to work independently and think critically.



If interested please contact:

Daniela Gonçalves da Silva
ddasilva@uni-bremen.de