

Coral Growth

The underwater wonders of North Sulawesi, in the middle of the region with the highest marine biodiversity on the planet, not only offers a wealth of top dive locations, from the steep walls of Bunaken Island to the strange critters of Lembeh Strait, but are also a focal point for marine scientists from around the globe. A number of studies and observations have been conducted here, from the discovery of the Coelacanth to the well-published Eco-Reef project.

Currently, two PhD projects on coral reefs are carried out at several points around Bunaken, Gangga Island and in the Bay of Manado in collaboration with Sam Ratulangi University Manado and the German Center for Tropical Marine Biology in Bremen (www.zmt-bremen.de). Sascha Romatzki and I arrived in Manado

in early 2005 to begin our two-year studies. While Sascha is interested in the growth and reproductive cycle of corals, I am focussing on the interaction between a reef area and the fishes that live in it. Our first experiments were set up in the summer of 2005 around Gangga Island with the generous help of Gangga

Island Resort. In the shallow house reef in front of the resort, we set up a number of steel structures and attached coral fragments from the surrounding reefs to it. Two of these structures are connected to a low electrical current, leading to the deposition of calcium carbonate from the seawater (picture white rock growing

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on the steel frame), while one structures serves as a control. Sascha is monitoring the growth of the coral fragments to see whether electricity can help to increase the growth performance of corals – an important question, since this technology could turn out to be a simple

and efficient tool in the restoration and preservation of damaged or threatened reefs. Simultaneously, he is deploying limestone plates at the structures that serve as a substrate for baby corals to settle on. The settlement rates on the structures are then compared to those

of natural reefs in the area to learn about the effects of electricity on coral recruitment.

In order to find out more about the mechanisms in reef restoration, we selected a number of 100 m² rubble fields in the reef (unfortunately, these are a common feature throughout many reefs – a legacy of decades of destructive fishing using explosives and poisons) and erected artificial reef structures made from concrete blocks (these serve as refuge for fishes on the otherwise flat rubble) on two fields, while one remains unchanged as a control. In addition, thousands of living fragments were transplanted into one of the structure sites. In reef restoration, both artificial structures and transplantation of coral are frequently used, and I am interested in the relative effect of both on the fishes living on the reef. To find out differences between the sites, I am counting and identifying the fishes at the three fields once a month. I am also deploying settlement plates to see whether the



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presence of structures or living corals has an effect on the settlement of baby corals. After half a year, the first results look promising, the transplanted corals are growing extremely well in their new environment, and the number and biodiversity of fishes is much higher in the site with corals and structures than in the unchanged rubble field and even higher than in the field with structures alone.



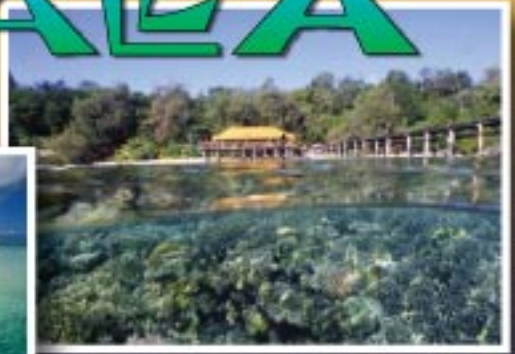
Together with students of Sam Ratu-langi University Manado, we recently finished a second set of structures and transplants in the Bay of Manado, close to the village of Meras, and a third one is currently being set up on Bunaken Island with the help of Froggies Divers. While the design of the experiments is purely scientific and is not meant to represent the optimal method of reef rehabilitation, the results will hopefully help us in finding out the best suited and most economically sensible methods in dealing with the increasing threats to our beautiful coral reefs.

I am often asked why I chose North Sulawesi for my work – besides the fact that the marine diversity in this area is unparalleled, it is also the friendliness and generosity of the people here, from local students to resort staff and –owners, that make living and working here truly unique.

For further information on electric reefs, visit www.globalcoral.org. or contact us directly as follows; sebastian.ferse@zmt-bremen.de or sascha.romatzki@zmt-bremen.de

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