The role of compositional reef heterogeneity in structuring fish community composition and functioning in Mae Haad, Ko Phangan, Gulf of Thailand

· Jan- Claas Dajka ·

Jan-C. Dajka (jandajka@uni-bremen.de), Master Student of Marine Biology, Leibniz Centre of Tropical Marine Biology (ZMT), Bremen, Germany.

The majority of studies conducted on the recreationally important coral reefs of Ko Phangan in the Gulf of Thailand are focusing on climate change related issues. However, research conducted on Ko Phangan poses a knowledge gap in the area of habitat-fish-interaction. Functional fish groups such as herbi- or corallivores are known to shape and upkeep structure and composition of their habitat immensely; in turn, the benthic state of a reef influences the community assemblage of its inhabitants similarly. The balance between algal and coral coverage as well as rugosity – a measure of small-scale variations or amplitude in the height of a surface – are likely to affect fish communities most notably; especially so, fish assemblages with small home ranges.

The fundamentally important fish functional groups that provide coral reefs with the foundations of resilience, are understudied in the Gulf of Thailand; particularly how changes in habitat composition are affecting them has not yet been investigated. My research aims to fill this gap within the frameworks of a master's thesis. The proposed study would assess the role of compositional reef heterogeneity in structuring fish community composition and functioning.

Above all would stand the answering of the following questions within the limits of a reef in Mae Haad:

1. Do environmental factors drive selection of functional fish groups?
2. Are fish functional groups with smaller home ranges more affected by small-scale differences in environmental factors than large home range groups?

Two hypotheses are aimed to be investigated on one reef in Mae Haad, Ko Phangan, Gulf of Thailand.

Hypothesis 1: Environmental factors drive selection of functional fish groups on a reef in Mae Haad, Thailand. The environment provides a relatively small niche where few fish functional groups exist in. The functional role fulfilled by specific species depends on the local co-existence of other species with a similar functional role.

Hypothesis 2: Fish functional groups with smaller home ranges are more affected by small-scale differences in environmental factors (rugosity, algal coverage, coral coverage) than fish functional groups with larger home ranges.

These hypotheses stem from underlying assumptions on selection pressure, environmental factors and fish home range sizes that well may be subject to refining during the literature review.

Due to the time constraints of a master's study, the research will be conducted on a small (i.e. within-reef) scale. The research time would split into:

- two months of literature review concerning the field of functional reef fish and reef composition heterogeneity research (mid-October to mid-December 2014);
- four months of *in situ* data acquisition in Ko Phangan (late February to late June 2014);
- one and a half months finalisation (late June to mid-August 2014).

References

[Still to come once all Mae Haad studies have been obtained]