

# 琉球大学学術リポジトリ

## サンゴ被度とサンゴ礫内在・間隙微小動物相による 造礁サンゴ移植評価に関する研究

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Title: Research on coral restoration evaluation utilizing coral coverage and coral rubble interstitial microfauna

Abstract:

Coral reefs in the Ryukyu Islands, southern Japan, have been undergoing degradation and have suffered through bleaching events for two consecutive years (summers of 2016-2017) affecting especially shallow coral communities. On subtropical Okinawa Island, the prefectural government is working on coral reef restoration by outplanting coral colonies from family Acroporidae back to reefs after farming them inside protected nurseries in the inner reef. The same restoration protocol is planned for Kume Island by Okinawa Prefecture. In the first part of this work, the status of shallow coral reef communities in Kume Island was assessed at seven distinct locations in Shimajiri Bay, where restoration activities are planned. Results revealed that the benthic environment in the bay has algae as the main component, and an average coral cover of only 7.2%. Branching coral colonies comprised just the 7.6% of the total coral cover. In Shimajiri Bay, the genus *Acropora* was almost completely absent, but its recent presence was confirmed by 4.12% of dead colonies of total transect coverage. Understanding the environmental situation at Kume Island is required, including the effects of human activities on coral reef communities, to have a higher possibility of success in restoration activities.

In the second part of this thesis, the ongoing restoration efforts in Onna Village, Okinawa, were evaluated by comparing outplanted locations with nearby control locations with no restoration activity. Three sites on the coast of Onna Village on the west coast of the island were examined; each site included an outplanted and control location. Methods used were: 1) coral rubble sampling to evaluate and compare abundance and diversity of rubble cryptofauna; and 2) coral reef monitoring using Line Intercept Transects (LIT) to track live coral coverage. Rubble shape had a positive correlation with the numbers of animals found within rubble themselves and may therefore constitute a reliable abundance predictor. Outplanted locations did not show differences with the controls in rubble cryptofauna abundance but had significantly lower coral coverage. Differences between sites were significant, for both rubble cryptofauna and coral coverage. DNA barcoding analyses were run for phylum Arthropoda using OTUs, and also in this case no significant differences were reported between control and outplanted locations. From this study it seems that coral reef restoration does not have any effect in increasing benthic biodiversity or coral cover.