



Title	Competition between corals and algae, and its effect on coral population sustainability(Digest_要約)
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Digest

Competition between corals and algae, and its effect on coral population sustainability

Coral reefs around the world are facing a crisis of degradation caused by local and global anthropogenic impacts. Phase shifts to alternative stable states, which are from coral- to macroalgal-dominated communities, have progressed over recent decades on a few coral reefs because of reduced herbivory and excess nutrients. As algae are often superior competitors to reef building corals for light and space, corals can fail to recover from severe disturbances without abundant herbivores and oligotrophic seawater. However, coral communities have not been necessarily replaced by macroalgal communities after severe disturbances. Recovery of coral communities in Okinawa after severe disturbances has been delayed but macroalgal blooms have not been observed frequently. Instead, turf algae have been increasing in cover at some areas in Okinawa after the disturbances. It is necessary to understand how turf algae are competing with corals, and whether this competition affects coral population sustainability. Thus, I focused on the effect of biotic competition between corals and turf algae under anthropogenic impacts, and reveal the conditions for coral population sustainability by field experiments and field surveys. The major findings of this dissertation are: 1) reduced herbivory can increase algal biomass; 2) not only macroalgae but also turf algae can prevent coral growth; 3) survival rate, growth rate and larval supply from neighboring populations is critical for the population viability of corals. These results indicate that even it is not fatal for corals, blooms of turf algae can affect coral population dynamics. I suggest that the prevalence of turf algae should be checked in addition to macroalgae during coral reef monitoring.

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