

PALESTRA
EXTRAORDINÁRIA

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EVEN SMALL MARINE PROTECTED AREAS PROVIDE REFUGE TO REEF FISH ASSEMBLAGES, FEEDING GROUPS, AND CORAL RECRUITS: EVIDENCE FROM FIJIAN CORAL REEFS

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On coral reefs, establishing no-take marine protected areas (MPAs) is a common management strategy for preserving healthy reefs or enhancing the recovery of degraded systems. A fundamental question for conservation is whether the benefits of MPAs occur for small MPAs (<math><1\text{ km}^2</math>), where the home range of target fishes often exceeds MPA boundaries. Also, little is known about the effects of MPAs on different levels of organization on coral reefs, from social interactions to community structure and ecosystem processes. We compared fish assemblages, fish feeding groups and density of coral recruits in three paired, small, no-take MPAs and adjacent unprotected areas (non-MPAs) on coral reefs in Fiji. The studied MPAs were established 8-10 years before our study. MPAs contained greater species richness, density and biomass of some trophic categories, including grazers and piscivores, than non-MPAs. Feeding groups were more diverse within two MPAs, and fish biomass per group was greater within all three MPAs. Differences in mean group size between MPAs and non-MPAs were not significant, but fish groups with more than 75 individuals occurred exclusively within MPAs. Two MPAs had three-fold more coral recruits than associated non-MPAs. The studied MPAs showed significant ecological contrasts with their adjacent fished areas across small spatial and temporal scales. Although most knowledge on the benefits of MPAs to coral reefs is based on studies on large protected areas, this study indicates that the establishment of small MPAs may also benefit reef fish assemblages, with potential outcomes to fish social interactions and ecological processes.



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