

Endemic species dominate reef fish interaction networks on two isolated oceanic islands

Fernández-Cisternas, I., Majlis, J., Avila-Thieme, M. I., Lamb, R. W., & Pérez-Matus, A. (2021). Endemic species dominate reef fish interaction networks on two isolated oceanic islands. *Coral Reefs*, 40(4), 1081-1095. <10.1007/s00338-021-02106-w> Accessed 30 Oct 2022.

Abstract

Ecological interactions are found across ecosystems, facilitating comparison among systems with distinct species composition. The balance of positive and agonistic interactions among species may be sensitive to variation in the diversity and abundance of species in a community. We studied marine interaction networks among reef fishes on two oceanic islands characterized by high rates of endemism and restricted population connectivity: Rapa Nui (Easter Island) and Robinson Crusoe Island (Juan Fernandez Archipelago). Specifically, we examined whether the type and strength of behavioral interactions varied between these two isolated fish assemblages, how the relative proportions of agonistic and positive interactions compare, and which are the most important interacting species in each system. Combining detailed interaction records using standardized remote underwater video and visual censuses, we observed: (a) Rapa Nui contains 50% more fish species but half the fish densities than Robinson Crusoe, (b) despite these differences, the total number of interactions and proportion of all potentially interacting species were similar between the two oceanic islands; (c) the species that occupied the greatest proportion of all potential interactions in each community were endemic to their respective islands; (d) the relative frequency of positive and agonistic interactions varied, with more agonistic interactions in the more speciose reef system (Rapa Nui) and more positive interactions where fish densities were higher (Robinson Crusoe); and lastly (e) the relative abundance of each species predicted the interaction strength and the number of interactions across all reef fish species. It is of particular importance to understand the role of endemic species and processes affecting reef fish ecological networks on oceanic islands given the multiple anthropogenic threats to these isolated and vulnerable ecosystems.

Keywords

Coral reefs, Temperate reefs, Biotic interactions, Reef fishes, Endemics, Endemism.