

# BIOGEOGRAPHIC AND ENVIRONMENTAL DRIVERS OF REEF FISH DIVERSITY IN COASTAL ISLANDS OF THE GULF OF THAILAND

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## ABSTRACT

Islands, critical environments for marine biodiversity, have endorsed several classical ecological theories. However, most studies on marine communities in islands are restricted to oceanic settings; whether premises of island biogeography apply to coastal islands is still unknown. In the Gulf of Thailand (GoT), coral reefs occur in nearshore coastal islands, subject to a wide range of environmental conditions, diverging from the most-studied oceanic counterparts. We investigated fish communities of 51 reefs at 10 sites spanning ~1500 km of the GoT coast, to answer whether diversity and species composition were (1) more influenced by area and isolation than by local environmental conditions and/or (2) affected by the geographical position. As predicted by island biogeography models, diversity decreased with island isolation, albeit only for rare species; reef area increased diversity but solely for common and dominant species. The effect of the geographical position of reefs within the GoT was negligible. Small-scale differences in local conditions of turbidity and depth affected diversity and composition more than isolation and SST. Within-island variability in these conditions yielded a high local turnover of species, enhancing within-site gamma richness, even when the mean alpha richness per site was low. Trophic group composition was similar among most sites, but extreme conditions of environmental constraints (e.g. very high/low turbidity) rendered changes in the dominant trophic group. Results suggest that island biogeography models apply to the reef fish communities in coastal islands to some extent, but the broader ranges of local conditions are the primary drivers of their diversity and composition.

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