Single and joint effects of regional- and local-scale variables on tropical seagrass fish assemblages

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ABSTRACT

Seagrass beds are highly important for tropi- cal ecosystems by supporting abundant and diverse fish assemblages that form the basis for artisanal fisheries. although a number of local- and regional-scale variables are known to influence the abundance, diversity and assemblage structure of seagrass-associated fish assemblages, few studies have evaluated the relative and joint (interacting) influences of variables, especially those acting at different scales. Here, we examined the relative importance of local- and regional-scale factors structuring seagrass-associated fish assemblages, using a field survey in six seagrass (Thalassodendron ciliatum) areas around Unguja Island (Zanzibar, Tanzania). Fish density and assemblage structure were mostly affected by two regional-scale variables; distance to coral reefs, which positively affected fish density, and level of human development, which negatively affected fish density. On the local scale, seagrass biomass had a positive (but weaker) influence on fish density. However, the positive effect of seagrass biomass decreased with increasing level of human development. In summary, our results highlight the importance of assessing how multiple local and regional variables, alone and together, influence fish communities, in order to improve management of seagrass ecosystems and their services