

## **The influence of reef type and seasonality on population structure of coral-reef fishes within Malindi Marine Park, Kenya**

*Gamoe A. Locham<sup>1,2</sup>, Boaz Kaunda-Arara<sup>2</sup>, Chrisestom M. Mlewa<sup>3</sup>*

*Marine Ecology Volume 31, Issue 3, pages 494–505, September 2010*

### **Abstract**

Effective conservation requires knowledge of the effects of habitat on distribution and abundance of organisms. Although the structure of coral reef fish assemblages is strongly correlated with attributes of reef structure, data relating reef types to fish assemblages are scarce. In this study we describe the influence of gross habitat characteristics and seasonality on coral reef fish assemblages of fringing and patch reefs in Kenya. Results showed that total fish abundance was not significantly different between the reefs; however, the fringing reef had higher species diversity during both the northeast (42 spp.) and southeast (36 spp.) monsoon seasons when compared to the patch reef. The more fished species (*e.g. Siganus sutor* and *Lethrinus mahsena*) were more abundant on the patch reef in both seasons. Statistical analysis indicated common species between the reefs were more abundant on the fringing reef. Seasons affected abundance of the more vagile species (*S. sutor*), whereas the reef-attached sky emperor, *L. mahsena* was affected more by reef type than by seasons. No significant interaction effects of habitat and seasons were found, indicating independence of habitat and environmental variability in affecting fish assemblages on the reefs. Smaller sized fish dominated the fringing reef more than the patch reef, whereas the skewness index ( $S_k$ ) indicated a normal-sized frequency distribution on the patch reef. Trophic structure of the fishes varied more within than between reefs, whereas fish assemblage structure was affected more by seasons on the fringing reef. These results suggest that conservation measures such as marine protected area (MPA) design and setting should consider effects of reef morphology and environmental variability on coral-reef fish assemblage structure.