

# Coral reef quality off the west coast of Unguja Island, Zanzibar

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Coral reef quality can be measured using a suite of different methods. In this particular study, the quality of six coral reef sites located on the west coast of Unguja Island (Zanzibar, Tanzania) was analysed and compared with previous studies conducted in the same area using three distinct methods. The measurements of 1) benthic cover, 2) sea urchin density, and 3) levels of trace metals were collected in order to test hypotheses stating that reefs closer to the capital of the island, Stone Town, were more deteriorated than reefs located further away due to potential anthropogenic impacts.

Four replicates were taken at each site for the measurements of sea urchin density and benthic composition of the reef. A methodical process that included the use of transects was used in order to obtain a representative analysis of the reefs. For the measurement of trace metals, which are indicative of the levels of pollution, 12 samples (six from sediments and six from a species of sponge, *Haliclona fascigera*) were obtained from every site, with the exception of Chapwani. These samples were then processed in the laboratory.

The data were then analysed and some results indicated a gradient of reef quality whilst others remained inconclusive. The first two measurements of reef benthos and sea urchin density depicted higher rates of coral reef degradation in sites closer to Stone Town than those located further away. Conversely, analysis on the levels of trace metals, when compared to other studies, did not reveal any unusual values. Enrichment Factor and Biota-Sediment Bioaccumulation Factor were also calculated using the concentrations of the trace metals. Those results showed some sites where enrichment had an anthropogenic source and some trace metals that were being bioaccumulated by a species of sponge, *H. fascigera*. It is therefore possible to conclude that this species is a suitable bioindicator for further studies.

Keywords: biomonitor; benthos; line transects; MPA; pollution; Tanzania