Crab Burrow Density as an Indicator of Mangrove Health; Case Study Kilifi Creek, Kenya

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Mangrove forests are of great ecological, biodiversity and socio-economic importance, despite their importance, mangrove forests are disappearing fast due to the cumulative impacts of anthropogenic pressures on the ecosystems. In order to sustain the ecosystem services derived from mangrove ecosystems there is a need to continuously monitor the health of these ecosystems using simpler, cheaper and more effective tools. The present study was aimed at assessing the use of crab burrow density as an indicator of the mangrove health in an effort to develop faster rapid assessment tools for mangrove ecosystems. Brachyuran crabs are the most abundant benthic macro-invertebrates in mangrove ecosystems and are considered to be ecosystem engineers due to their burrowing activities. Two sites were selected for the study along the Kilifi Creek mangrove ecosystems. Sampling was conducted using 1x1m² quadrats along a 50-m transect at each site. Crab burrow density was assessed, further, the number of mangrove stands by species, and the canopy height and thickness, were determined along a 5m-width of the transect. The carapace widths (CL, cm) of the crabs were measured and the body weight (BW, g) taken. Analysis for correlation between mangrove forest characteristics including species, density, canopy cover (height/thickness) and crab burrow density and body condition (K) of the crabs was conducted. Results show that Avicennia marina was the dominant mangrove species in the study sites, while the brachyuran crabs were dominated by the family Ocypodidae. There was a significant relationship between the number of crab burrows and the canopy cover as well as between the mean burrow size and body condition. These results show that crab burrows are influenced by the mangrove canopy cover and the health of the stands. Therefore, burrow density and condition of the brachyuran species presents a rapid non-invasive way of assessing the health of the mangrove ecosystems.