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

B. Fulanda, R. Okoyo
Pwani University, Kenya
Pwani University, Kenya
b.fulanda@pu.ac.ke

Mangrove forests are of great ecological, biodiversity and socio-economic importance. Despite their importance, mangroves are disappearing fast due to anthropogenic pressures. Conservation of these critical habitats therefore calls for continuous monitoring of the health of these ecosystems using simple, cheaper and more effective tools. Brachyuran crabs are the most abundant macro-invertebrates in mangrove ecosystems, considered as ecosystem engineers due to burrowing and bioturbation. This study assessed crab burrow density as an indicator of the mangrove health. Sampling was conducted in two sites in the Kilifi Creek mangrove ecosystems a using 1x1m² quadrats along a 50-m transect method, from the outer edge of the mangrove to the shoreline. Crab burrow density was assessed and all specimens from each quadrat fixed in 70% alcohol for analysis in the lab. Further, the species and mangrove stands, canopy height and thickness, were determined along a 5m-width along the transects. In the laboratory, carapace widths (CL, cm) of crabs were measured using calipers and body weight (BW, g) taken on a digital scale. Correlation analysis was conducted for mangrove forest characteristics (species, density, canopy) vs. burrow density and body condition (K) of crabs. Avicennia marina was the dominant mangrove while brachyuran crabs were dominated by family Ocypodidae. There was a significant relationship between number of crab burrows and the canopy cover and between the mean burrow size and body condition. This shows that crab burrows are influenced by mangrove canopy cover and health of the mangrove stands. The "engineering" attributed of crabs and other decapod helps in improving the physical structure of intertidal habitats by "loosening" sediments regulates nutrient concentration, controls sulphides improving the condition of sediments with potentially higher productivity. Therefore, burrow density and condition of brachyuran species can be used as a rapid non-invasive way of assessing the health of the mangrove ecosystems.