IH290 Epifaunal diversity on mangrove prop-roots

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Does a higher degree of complex root systems have a higher diversity of root fauna, and do epifaunal communities change with shore height/immersion times?

Mangrove ecosystems are considered to be extreme in many ways. Moreover, the daily dynamic variations of tidal movements, temperature and salinity are the driving force behind the extraordinary and unique fauna that thrive in these otherwise inhospitable habitats. In part, it is the association of the morphological adaptations of the mangrove flora that facilitate and make life possible for many extreme intertidal specialist taxa. The availability of hard substrata, such as *Rhizophora stylosa* aerial prop-roots provide an ideal habitat for prime mangrove real-estate that sessile epifaunal communities and motile fauna alike are able to exploit. In addition, the increased complexity of root structures will also benefit the creatures that depend upon them, as increased complexity or niche availability has been demonstrated to reduce predator-prey interactions.

Animals such as Oysters, Mussels, sponges, Littorina, whelks and Sesarmid crabs are integral species towards the community structure of mangrove diversity. Many of the resident sessile fauna such as animals belonging to the family Mytilidae (mussels) and the Porifera (sponges) filter the water. To add, some are important detritivores that process much of the decaying leaf litter. *Terebralia sulcata* (whelks), *Littorina sp* and sesarmid crabs mediate the essential trophic flow of nutrients throughout these unique ecosystems. Thus, many of these species are integral towards the trophodynamics and primary catalysts of mangrove energy pathways. These animals rely on hard surfaces at low tide such as prop roots. If wood harvesting continues, what would be the ecological impact upon both ecosystem level and species level ecology?

Brief experimental design:

Using transects across the shore profile, sample prop root stands with various levels of complexity (metre^2). Measure the roots. From the base of the root to the high tide mark identify the epifauna communities found. With this information, comparisons of epifaunal diversity can be made between varying levels of root complexity from the shore to the outermost fringing edge of the forest. To add, comparisons of epifaunal communities can be made from the strandline leading out to the outermost fringing edge. These data will identify the change of faunal communities in relation towards emersion/immersion time. Moreover, the wider ecological context would be the changing effect of climate change, in particular increasing sea levels which may force the re-distribution of epifaunal communities within the mangrove system.

To study succession and recruitment rates, plastic tubes can be used as ‘pseudo’ roots – to research how quickly the fauna can re-colonise after potential root loss. These data will

demonstrate the resilience of the mangrove fauna, and may highlight the potential impact of harvesting wood upon these extraordinary animals.