A study on the impact of herbivorous crabs on mangrove propagation in Chilaw lagoon, Sri Lanka

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Mangroves are tropical coastal forests growing only in tropical regions, at the interface which is inundated by the ocean and where environmental conditions are highly variable. A unique set of animal species coexist, live and interact in these mangroves, especially crabs. Herbivorous crabs play a big part in the success or failure of mangrove propagation. In this ongoing work we study the interaction between herbivorous crabs, including Episesarma tetragonum and some species of mangrove trees, mainly Bruguiera gymnorrhiza, B. sexangula, Rhizophora mucronata, and Avicennia officinalis in Chilaw lagoon, on the west coast of Sri Lanka. Various experiments were conducted to confirm if there is a consumption preference of the crabs and which is its impact on the propagule. The first one was based on binary choices between leaves and/or propagules of B. sexangula, R. mucronata and/or A. officinalis while considering propagule size, shape and species. This experiment was repeated in a mixed zone and a zone dominated by Excoecaria agallocha. In the mixed zone, preliminary results indicate that crabs seem to prefer leaves over propagules except when A. officinalis propagules are involved. They prefer A. officinalis leaves rather than leaves of other species, even if the others are cut into the same size as A. officinalis leaves. Similar results were observed for the A. officinalis propagules. In the E. tetragonum-dominated zone, different results were observed: E. tetragonum seems to prefer leaves and propagules of R. mucronata, a species which is not even present in the zone. The only exception is when A. officinalis leaves were involved. We believe that all preferences could be related to a combination of ease of removal and nutrition value.

The second experiment aimed at quantifying the impact of the soil depth on germination of A. officinalis and B. sexangula propagules. Forty propagules of each species were planted at two depths, 5 and 10cm. Preliminary results show that after six days half of the A. officinalis propagules were rotten (58% at 5cm depth, 50% at 10cm depth), the rest was unaffected (24% at 5cm depth and 50% at 10cm depth) or unfound (18% at 5cm depth and 0% at 10cm). For B. sexangula propagules, none of the propagules was affected and very often, some roots appear. We recorded a mean length of 0,4cm at 5cm depth and 0,35cm at 10cm depth. The causes of such a difference in mean length are still under investigation.

Keywords: Crab herbivory; feeding preference; mangrove propagules; Sri Lanka.