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## A Closer Look at Boring Issues: Root-Inhabiting Invertebrates, and their Role in Mangrove Ecology

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### Abstract

Inhabiting the intertidal zone along tropical and subtropical coasts, mangrove trees are prone to attack by both terrestrial and marine parasites. Wood-boring marine invertebrates, such as amphipods, isopods or gastropods, for instance, settle on aerial roots of mangrove trees during tidal submersion and drill holes into the wood. Heavily infested pieces of wood with drastically decreased stability through severe tunneling-activity can frequently be found in the intertidal area of, and next to, mangrove forests. However, these trunks appear to be mostly settled on after having been detached from the tree. It is essentially unknown what triggers settlement by marine wood-borers on living woody tissue of mangrove trees, as well as what are the consequences of infestation of living trees and their roots by marine wood-borers on either the individual tree or the mangrove system. We studied (1) effects of root-inhabiting isopods on root growth and survival in the field; (2) effects of phenolic wood exudates on colonisation of mangrove wood by shipworms in the lab; (3) small-scale environmental conditions around holes of shipworm in mangrove wood. Preliminary analyses suggest that wood-boring isopods do not increase the die-off risk of individual aerial roots, but affect root growth and reduce their chance of reaching the sediment. A complex mixture of phenolic compounds is released from mangrove roots into the water, potentially affecting the nearby environment and the attractiveness of the root as habitat for marine wood-borers. When densely colonizing mangrove roots, wood-borers can affect oxygen consumption and water movements next to mangroves. These studies serve as a basis for large-scale studies on element fluxes from mangrove roots into coastal waters.

**Keywords:** Element fluxes, intertidal zone, mangrove roots, parasites, tropical and subtropical coasts, wood-boring marine invertebrates