

# Impact of typhoon disturbance on key macrobenthos in a monoculture mangrove forest plantation, Can Gio Biosphere Reserve, Vietnam

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## Abstract

The intensity of tropical storms may increase due to climate change and damage mangrove forests, particularly monocultures, due to their low structural diversity. Crabs may positively influence the recovery of storm-damaged forests, yet the response of these ecosystem engineers to storm disturbance is largely unknown. Here we compare the crab community of intact mangrove stands with that of typhoon gaps having experienced 100% tree mortality in two adjacent areas in Can Gio, S-Vietnam. In each area, an 18-20 yr old monoculture *Rhizophora apiculata* stand served as control and was compared with typhoon gaps where downed stems had been removed or left on-site. The gaps were 14 and 20 months old when sampled in the dry and rainy season 2008. Four people manually caught crabs during 30 min in each 100 m<sup>2</sup> plot (7 replicate plots per area, treatment and sampling) and abiotic and biotic measures were taken. Despite complete canopy loss, total crab abundance had not changed (in contrast to biomass) and all forest species were also found in the gaps. Gap-exclusive species existed and average species number and Shannon diversity were higher in the gaps. *Perisesarma eumolpe* was the most abundant crab, both in the forest and in the gaps and a shift from sesarmids (typical forest species) to ocypodids (more prominent in open areas) had not occurred. The persistence of litter-feeding sesarmids is probably linked to woody debris in the gaps, fuelling a mangrove detritus based food web, rather than one based on microphytobenthos with deposit-feeding ocypodids. The continuous abundance of burrowing crabs in the gaps suggests that important ecosystem engineering activities are still performed; however, bioturbation may be less strong as crab size/biomass was smaller in the gaps. Follow-up assessments study the long-term dynamics of the gap fauna as well as the crabs' impact on gap recovery.

## Keywords

mangrove crabs, storm disturbance, canopy gap, community structure, diversity