Sea-floor microbes may be affected by ailing shrimp in acidified oceans

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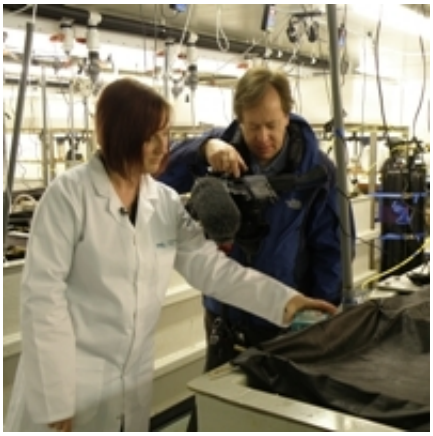

Disrupting just one process in the important relationship between microbes and bigger plants and animals that live in ocean floor sediment may have knock-on effects that could reduce the productivity of coastal ecosystems, according to international research published online yesterday in *Philosophical Transactions of the Royal Society B*.

Dr Bonnie Laverock, an Indian Ocean Marine Research Centre Research Fellow associated with The University of Western Australia, is the lead author of the paper which outlines the effects of ocean acidification on marine microorganisms.

Dr Laverock and her team from the UK and the US are the first to

investigate the impacts of ocean acidification - caused by increasing concentrations of dissolved carbon dioxide - on the interactions between macro and micro-organisms in sediments.

"There has been very little work done so far on the microbial responses to ocean acidification in the benthic (sea floor) zone," she said. "In particular, little is known about how microbial processes may be affected by the responses of larger animals or plants.

"We show that the presence of the mud shrimp can perform the useful task of increasing nitrification rates in coastal sediments, but that this enhanced ecosystem function is inhibited by ocean acidification. Our results indicate the importance of multi-species interactions in determining how individual organisms or groups of organisms will respond to environmental change."

Dr Laverock said previous studies had suggested that burrowing mud shrimp spent more time beating their pleopods (walking legs) to try to increase their oxygen supply in seas that are increasingly acidic. The shrimps' distress - and consequent alteration of their relationship with the nitrogen-cycling microbes that live in their sediment burrows - was just one example of an interwoven system breaking down.

Dr Laverock carried out the practical work for the study at Plymouth Marine Laboratory and is now investigating the microbial processes contributing to ocean productivity in Western Australia.

"WA's coastlines support the highest diversity of seagrasses in the world, as well as a great diversity of kelps and seaweeds and a number of iconic species - such as dugongs and turtles - which rely on benthic productivity for food and/or shelter," she said.

"My work at UWA's Oceans Institute aims to examine these processes

and the relationship between microbes and coastal productivity in WA now and in future oceans."

Provided by University of Western Australia