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Media Release

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Seaweeds shelter calcifying marine life from acidifying oceans

Seaweeds could provide a refuge for calcifying marine organisms at risk from ocean acidification, according to a new study by IMAS scientists published in the British Ecological Society's journal *Functional Ecology*.

Dr Fanny Noisette and Associate Professor Catriona Hurd studied the most common and widespread kelp in the southern hemisphere, *Ecklonia radiata*, focusing on the chemical microenvironment that develops right at the surface of their blades.

Using kelp blades from Tasmania's Tinderbox Marine Reserve, the study included laboratory experiments to measure the characteristics of the microenvironment under different light and water flow conditions.

CO2 in the atmosphere dissolves directly into seawater, lowering the pH and making it increasingly acidic. Kelp and other seaweeds are ecosystem engineers that shape their physical and chemical surroundings, soaking up CO2 during the day through photosynthesis and temporarily increasing the pH level of seawater.

Dr Noisette said the study showed that in slow flow, kelp create a microlayer above their blades with much higher pH levels than in the surrounding seawater.

"With the increasing risk of ocean acidification, small calcifying organisms such as bryozoans, tube-forming worms, small molluscs or crustaceans living on the blades might be able to better cope with this phenomenon," Dr Noisette said.

"Bryozoans and tube-forming worms are filter-feeding organisms, contributing to the control of planktonic populations.

"Moreover, they can form colonies on a variety of different surfaces, from rocks to sandy sediments to the hulls of ships providing hard habitats and shelter for juveniles of other species.

"These and other calcifying organisms are especially vulnerable to ocean acidification as it prevents them from forming and/or repairing their shells or skeletons.

“Kelp blades may be able to provide some relief from these corrosive and harmful conditions.

“Some invertebrates are very small in their early life stages and could also find shelter in these microenvironments shaped by kelps.

“Larvae, for example, are usually not able to regulate their internal pH and are more sensitive to decrease in seawater pH.

“By settling on the blades in their early stages of development, they might be able to temporary alleviate stress or train for the harsher conditions that await them in the open ocean,” Dr Noisette said.

Associate Professor Hurd said the study adds to growing evidence that seaweed communities could locally mitigate the negative effects of ocean acidification and help coastal ecosystems adapt to global changes.

“Seaweeds not only influence the pH at the microscale as described in this study, they may also help larger animals including clams, oysters and crabs to overcome the effects of ocean acidification.

“It is now well known that the pH below seaweed canopy is generally different from the surrounding water,” Associate Professor Hurd said.

Media Contact: Andrew Rhodes + 61 (03) 6226 6683, email: ajrhodes@utas.edu.au

Information released by:
Communications and Media Office, University of Tasmania
Phone: 61 3 6226 2124
Email: Media.Office@utas.edu.au