

MEDIA RELEASE

NEWS FROM THE UNIVERSITY OF TASMANIA

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ATTENTION: Chiefs of Staff, News Directors



Increasing CO₂ causing abnormalities in Antarctic krill

A pilot study on the effect of carbon dioxide on Antarctic krill by the University of Tasmania has uncovered worrying signs for the future of the Southern Ocean ecosystem.

In a world-first experiment by the Institute of Antarctic and Southern Ocean Studies (IASOS), based at UTAS, Honours student Lilli Hale investigated the effects rising carbon dioxide (CO₂) levels have on the development of krill.

Krill is a critical species in the Antarctic food chain.

Ms Hale exposed krill to CO₂ levels that were manipulated to two levels: one projected to occur by the end of the century and the other 300 years into the future.

Although the study was preliminary, Ms Hale found that with an increase in CO₂, development of krill was indeed affected.

There were irregularities in form and structure and decreased activity in krill larvae exposed to the concentrations of CO₂ at the level predicted by the end of the century.

“Although effects were not lethal at this concentration, it is unlikely these experimental animals would have survived through to adulthood,” Ms Hale said.

“The population will be dramatically affected if larvae are not developing normally.”

The fertilised eggs did not hatch at all at the 300 year projection.

Ms Hale said these findings suggested a catastrophic impact on other species which relied on krill in the food chain.

“Antarctic krill play a key role in the structure and function of the Southern Ocean ecosystem, serving as both an important grazer and critical prey item for reproductive successes of whales, seals and seabirds,” she said.

Atmospheric CO₂ concentration is increasing due to rising global emissions which are in turn absorbed into the ocean, making it more acidic. The increased CO₂ also alters the oceanic carbonate chemistry, reducing the calcium carbonate saturation.

Crustaceans, including krill, rely on calcium for mineralisation of their exoskeleton after moulting.

The IASOS study was in collaboration with Dr Haruko Kurihara and Professor Atsushi Ishimatsu, from the Institute for East China Sea Research, Nagasaki University, and Dr So Kawaguchi, from the Australian Antarctic Division.

Scientists at AAD and an IASOS Masters student are now extending the study to include the effects of elevated CO₂ on adult krill.

The Southern Ocean may be the one of the first to be affected by ocean acidification as CO₂ has greater solubility in colder waters.

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