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Box jellyfish will destroy future oceans by gobbling up the food

Who ate all the copepods?
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By **Christie Wilcox**

As the oceans become more acidic, box jellyfish may start eating a lot more. Their greedy appetites could have a huge impact on marine ecosystems.

Some of the carbon dioxide we release is dissolving in the oceans, where it becomes carbonic acid – making the oceans less alkaline and more acidic. Scientists are scrambling to identify which species will be most impacted.

They are particularly concerned about organisms that play pivotal roles in marine food webs, because if they disappear, entire ecosystems may collapse.

Copepods are particularly critical. These tiny crustaceans are the most abundant animal on earth by mass. They swarm in vast numbers in some regions of the ocean, where larger animals feast on them.

What happens to copepods affects all that depend on them, "which is pretty much everything," says Edd Hammill of Utah State University in Logan.

Previous studies have found copepods may be fairly resistant to ocean acidification. However, these have largely focused on single species, so community-level effects may have been missed.

To find out, Hammill and his colleagues collected zooplankton and one of their gelatinous predators, the box jellyfish *Carybdea rastoni*, from the waters around Australia. They kept the plankton in tanks containing either ambient seawater or seawater acidified at levels predicted for 2100, then added box jellyfish to half of the tanks. After 10 days, they counted what survived.

Both acidification and box jellyfish reduced the number of copepods, but both together caused 27% more deaths than the sum of the two individually. The jellyfish were eating more: they gobbled up nearly 37% of copepods in the ambient seawater tanks, but almost 83% in the acidified water.

Hammill thinks the copepods were weakened by the acidified water and that the jellyfish took advantage, but can't rule out other possibilities. "It could be the jellies are being negatively affected by the acidified water and are needing more prey to get along," he says.

"It is a simple and clever experiment with some intriguing results," says Nyssa Silbiger of California State University, Northridge. It highlights the critical need to better understand community dynamics in response to changing environmental conditions, she says.

"If these results do translate to the global oceans, even just a little, it could have potentially dramatic and cascading effects on the ocean food web," Silbiger says.

Other jellyfish are likely to respond similarly to acidified water, says Hammill.

He plans to look at the Arctic ecosystem next. "It's the most productive and one of the largest ecosystems [in] the world," he says. If the same pattern occurs, it "could be a really big deal".

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