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## Acid oceans leave fish at more risk from predators



Clown fish reared in acidified water lost the ability to "smell" danger

**Ocean acidification could cause fish to become "fatally attracted" to their predators, according to scientists.**

A team studying the effects of acidification - caused by dissolved CO<sub>2</sub> - on ocean reefs found that it leaves fish unable to "smell danger".

Young clownfish that were reared in the acidified water became attracted to rather than repelled by the chemical signals released by predatory fish.

The findings were published in the journal Ecology Letters.

Danielle Dixson from James Cook University in Queensland, Australia, led the study.

She and her colleagues tested orange clown fish larvae that were raised in water with the same slightly alkaline pH as their ocean reef habitat, and those raised in more acidic water.

The team released the fish into a "flow chamber" with two water sources flowing in parallel.

One source was taken from tanks containing the clown fishes' natural predators and one was drawn from tanks in which non-predatory fish were swimming.

"The flow rates are identical, so the water won't mix," Ms Dixson explained. "This allows the fish in the chamber to choose which water cue they prefer or dislike."

In the test, the fish reared in normal water avoided the stream of water that their predators had been swimming in. They detected the odour of a predator and swam away from it.

But, Ms Dixson said, fish raised in the more acidic water were strongly attracted to both the predatory and the non-predatory flumes.

The researchers say that their study shows that fish larvae "might exhibit a fatal attraction to predators at CO<sub>2</sub> and pH levels that could occur in our oceans by 2100 on a business-as-usual scenario of greenhouse gas emissions".

## **Smell of danger**

Previous studies have shown that fish rely on their sense of smell, or olfaction, to avoid being eaten during the what is known as their settlement process. This is when the recently hatched larvae find a suitable, and safe, place to live.

At this vulnerable juvenile stage, the researchers pointed out, "the ability to detect and avoid predators is one of the most important mechanisms to ensure survival".

Ms Dixson told BBC News: "Ocean acidification has the potential to become a widespread problem and it's unknown how many organisms and ecosystems will cope with the decrease [in] pH.

"This study shows that ocean acidification could lead to an increase in the mortality of larvae."