

Stealth swimmers: The fish that hide behind other fish to hunt

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The researchers spent hours underwater pulling model fish along a wire past colonies of damselfish, and filming their responses. Credit: Sam Matchette

A new study provides the first experimental evidence that the trumpetfish, *Aulostomus maculatus*, can conceal itself by swimming closely behind another fish while hunting—and reduce the likelihood of being detected by its prey. The study, involving collaborators at the University of Bristol, was published in the journal *Current Biology*.

In this 'shadowing' behavior, the long, thin trumpetfish uses a non-threatening species of [fish](#), such as parrotfish, as camouflage to get closer to its dinner.

This is the only known example of one non-human animal using another as a form of concealment.

The research involved hours of diving in the Caribbean Sea, pulling hand-painted model fish along a wire.

"When a trumpetfish swims closely alongside another species of fish, it's either hidden from its' prey entirely, or seen but not recognized as a predator because the shape is different," said Dr. Sam Matchette, a researcher in the University of Cambridge's Department of Zoology and first author of the study.

Damselfish, *Stegastes partitus*, form colonies on the seafloor and are a common meal for trumpetfish. Working among the [coral reefs](#) off the Dutch Caribbean island of Curaçao, researchers set up an underwater system to pull 3D-printed models of trumpetfish on nylon lines past colonies of [damselfish](#), and filmed their responses.

When the trumpetfish model moved past alone, damselfish swam up to inspect—and rapidly fled back to shelter in response to the predatory threat.

When a model of a herbivorous parrotfish, *Sparisoma viride*, moved past alone, the damselfish inspected and responded far less.

When a trumpetfish model was attached to the side of a parrotfish model—to replicate the shadowing behavior of the real trumpetfish—the damselfish responded just as they had to the parrotfish model alone: they had not detected the threat.

Matchette said, "I was surprised that the damselfish had such a profoundly different response to the different fish; it was great to watch this happening in real time."

"Doing manipulative experiments in the wild like this allows us to test the ecological relevance of these behaviors," said Professor Andy Radford in the University of Bristol's School of Biological Sciences, and co-author of the study.

Matchette, along with his co-author and dive buddy Christian Drerup, spent hours underwater, barely moving, to conduct their experiment.

Their earlier questioning of divers working at dive shops in the Caribbean revealed that trumpetfish are commonly seen swimming alongside parrotfish and other reef fish—but the reason for this remarkable behavior had not been tested.

In addition, divers were much more likely to have seen the shadowing behavior on degraded, less structurally complex reefs.

Coral reefs around the world are being degraded due to the warming climate, pollution and overfishing. The researchers say the strategy of hiding behind other moving fish may help animals adapt to the impacts of environmental change.



Damselfish didn't detect a threat when the two models passed by together.
Credit: Sam Matchette

"The shadowing behavior of the trumpetfish appears a useful strategy to improve its hunting success. We might see this [behavior](#) becoming more common in the future as fewer structures on the reef are available for them to hide behind," said Dr. James Herbert-Read in the University of Cambridge's Department of Zoology, senior author of the study.

Human duck hunters historically hid behind cardboard cut-outs of domestic animals—called 'stalking horses'—to approach ducks without being detected. But this strategy has received little attention in non-human animals and has never been experimentally tested before.

More information: Samuel Rhys Matchette, Predatory trumpetfish conceal themselves from their prey by swimming alongside other fish,

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