

# New research decodes the secret language of the sea

July 9 2009

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(PhysOrg.com) -- Even parasite-eating fish recognise the benefits of good advertising, UQ research has found.

UQ's Dr Karen Cheney and Professor Justin Marshall, along with colleagues from the School of [Biological Sciences](#), found cleaner [fish](#) - which are in the business of removing parasites from larger reef fish - used colour to catch the attention of potential clients.

Published online in scientific journal [Current Biology](#) is a study showing how cleaner fish have evolved a specific advertising signal involving a blue and yellow colouration, combined with conspicuous stripes.

"A combination of color and pattern is an important component of cleaner signals and helps attract client species to cleaning stations," Professor Marshall said.

Cleaner fish operate out of cleaning stations, usually found among the rocks and seagrass of the reef.

By using visual models, the researchers were able to "look through the eyes of potential clients".

"We were actually able to see what message the cleaner fish is sending from the perspective of the client," Professor Marshall said.

"We measured the visual response of three coral reef fish: the barracuda;

the UV-sensitive planktivorous damselfish; and the herbivorous surgeonfish.

“For all three visual systems, blue categories were the most contrasting colors against an average coral background, and yellow is the most contrasting colour against a blue water background.

“Therefore, blue and yellow appears to be the most conspicuous colours when signaling to potential clients.”

Using behavioural trials, the researchers also showed reef fish were more likely to visit cleaners whose bodies contained blue patterns.

“We tested the response of wild client fish to seven fish models made from resin and painted with a range of colors and patterns,” Professor Marshall said.

Reef fish - which ordinarily would eat the smaller cleaner fish - swim up and pose in a way which indicates they are ready for cleaning.

“The reef fish needs to be cleaned and the cleaner fish needs to eat the parasites in order to survive so there's a mutually beneficial relationship that exists between the cleaner and the host,” Professor Marshall said.

“A cleaner fish could be cleaning the teeth of a large coral trout and somehow it knows not to close its mouth.

“What we think the cleaner fish are saying - with colour - is that they have a service to offer.

“What we've managed to do is decode the language of the club.”

Professor Marshall and Dr Cheney are also co-authors of a paper

featured on the cover of the latest edition of The Journal of Experimental Biology.

The study found *Elacatinus* gobies, a species of cleaner fish found in the Caribbean, had developed blue and yellow stripes so they stood out to passing reef fish.

"Yellow and blue are the two colours which transmit best in the ocean," Professor Marshall said.

"It's interesting that these fish have managed to pick the right physics in terms of the colours that transmit the longest distance."

Provided by University of Queensland ([news](#) : [web](#))

Citation: New research decodes the secret language of the sea (2009, July 9) retrieved 24 April 2024 from <https://phys.org/news/2009-07-decodes-secret-language-sea.html>

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