

Shrimp talent quest finds a winner

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A school of sardines in Italy. Credit: Wikimedia / Alessandro Duci

Shrimp help keep fish clean—and scientists have identified the 'cleaner shrimp' with the most talent for reducing parasites and chemical use in farmed fish.

Fish and cleaner shrimp in the wild have a symbiotic relationship, with the [fish](#) lining up at shrimp 'cleaning stations' to have the shrimp comb

them for [parasites](#).

Now, after a multi-year search, scientists at James Cook University in Australia have nominated the peppermint shrimp as the best variety to take forward to commercial trials.

Ph.D. student David Vaughan led the study, working with Dr. Kate Hutson at JCU's Centre for Sustainable Tropical Fisheries and Aquaculture.

The team were looking for a natural alternative to chemicals for cleaning parasites off [farmed fish](#). Four shrimp species were tested against each other in a set of experiments to see which one would be the best for potential commercial application.

The peppermint shrimp out-performed all the rest, reducing infection by 87% by feeding on the eggs of the parasite that entangle on the fish cage netting that fish are kept in.

Mr Vaughan said the study was the first to examine the relative effectiveness of any shrimp as a biocontrol agent in reducing parasites on farmed fish.

"Biocontrols are live animals that are used to control a pest organism, such as the parasites in [aquaculture](#). Cleaner fishes such as wrasses and lumpfish are used in Europe to remove salmon lice, but there is no comparable cleaner currently used in tropical marine aquaculture. Our study shows that these shrimp are a viable candidate."

Parasitic diseases account for between 30 and 50 percent of annual stock losses in some aquaculture industries in Asia, the world's largest aquaculture producing region.

Antibiotics and other chemicals are used to combat the losses, but there are concerns about the sustainability of this practice, as some parasites can become resistant to chemical treatments.

Mr Vaughan said that one of the main problems is reinfections that result from parasite eggs and other environmental stages that are very difficult to remove. These environmental stages are also not affected by the [chemical](#) treatments used to treat the adult parasites on the fish, and the fact that the shrimp actively target these environmental stages is a massive advantage for farmers.

"This means the fish and the shrimp don't necessarily always have to be in direct contact, which reduces the chances of them being eaten by the fish. The peppermint [shrimp](#) can be bred commercially in large numbers and is found naturally across the Asia-Pacific region where much of tropical marine aquaculture originates."

Mr Vaughan said it was an exciting area to work in as biocontrol use in marine environments is in its infancy and many areas remained underexplored.

The next step is to upscale the trial in the field at an aquaculture farm.

More information: David B. Vaughan et al, Cleaner shrimp are a sustainable option to treat parasitic disease in farmed fish, *Scientific Reports* (2018). [DOI: 10.1038/s41598-018-32293-6](https://doi.org/10.1038/s41598-018-32293-6)

Provided by James Cook University

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