

Damselfish 'garden' algae

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This is a damselfish. Credit: Hata et al., *BMC Evolutionary Biology*

A species of damselfish, *Stegastes nigricans*, selectively weed the algal gardens on which they feed in order to encourage the growth of their preferred algal species of *Polysiphonia* and suppress the growth of less palatable algae. Researchers writing in the open access journal *BMC Evolutionary Biology* investigate the feeding preferences of damselfish and explore their diverse gardening systems across the Indo-West Pacific region.

Hiroki Hata from Ehime University, Japan, worked with a team of researchers to explore this 'gardening' behavior. He said, "We surveyed 320 territories of 18 damselfish species and thoroughly examined algae from each fish territory from [coral reefs](#) in Egypt, Kenya, Mauritius, the Maldives, Thailand, Borneo, the Okinawa Islands, and the [Great Barrier](#)

[Reef](#). We found that although the crop alga species shifted in the West Indian Ocean, the intensive farming by damselfish was seen throughout this geographic range".

The damselfish do not have any organs to allow them to grind cellulose fibers, and lack the [digestive enzymes](#) required to digest many algal species. The most common algae they can eat, the red alga *Polysiphonia*, are less competitive than the inedible species and so the damselfish help them out by killing off their rivals. This 'gardening' behavior results in a mutualistic association between *Polysiphonia* and this particular species of damselfish and it is notable for being one of the first examples of mutualism to be found in a non-terrestrial habitat. Speaking about the results, Hata said, "Obligate reciprocal interaction between marine algae and herbivorous damselfish, called 'cultivation mutualism' was found to be largely maintained in the Indo-West Pacific."

More information: Geographic variation in the damselfish-red alga cultivation mutualism in the Indo-West Pacific, Hiroki Hata, Katsutoshi Watanabe and Makoto Kato, BMC Evolutionary Biology (in press), www.biomedcentral.com/bmcevolbiol/

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