

# Fish team up for more food

March 6 2018

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Cooperative behaviour to acquire food resources has been observed in hunting carnivores and web-building social spiders. Now researchers have found comparable behaviours in a fish species. A tiny striped fish called *Neolamprologus obscurus* only found in Lake Tanganyika in Zambia excavates stones to create shelter and increase the abundance of food for all fish in the group. Led by Hirokazu Tanaka of the University of Bern in Switzerland and the Osaka City University in Japan, this study is the first to document how team work in fish helps them to acquire more food. The research is published in Springer's journal *Behavioral Ecology and Sociobiology*.

*Neolamprologus obscurus* is a highly sociable species of cichlid found only in the southern reaches of Lake Tanyanika. These zebra-striped [fish](#) feed mainly on shrimp and other invertebrates found along the bottom of the lake. At night, shrimp move into the water column, but by dawn they sink back to the lake bottom to hide in crevices and holes, including the shelters that the fish have dug out under stones. Such excavation work is always done as a group, as is subsequent maintenance efforts. Breeding fish seldom leave these safe havens and are supported by up to ten helpers from their family group. The helpers protect the brood, and constantly remove sand and debris that fall into the cavities.

"The function of these excavated cavities is much like that of the webs of social spiders, which live in groups and share the trapped prey among group members," explains Tanaka.

In this study, Tanaka and his colleagues wanted to find out if the size of

the cavities at the bottom of the [lake](#) relate to the abundance of food available in the area, and if the presence of helpers influences the size. Through hours of scuba diving in Lake Tanyanika, the researchers created artificial cavities and examined the stomach contents of some of the fish. In another experiment, the researchers removed helpers that were assisting breeding fish. Within a week, enough sand had fallen into the cavities to decidedly shrink these spaces. This effect was augmented when the helpers removed were big.

One of the key findings was that the size of an excavated crevice had an influence on the amount of shrimps that subsequently gathered in it. When there were more helpers around, the space that could be created was bigger and more shrimps could be gathered.

"Helpers in *Neolamprologus obscurus* extend and maintain the excavated cavities, and by doing so, contribute to an increase in food abundance inside the territory of breeding females," explains Tanaka.

"Fish living in groups may be able to increase and maintain considerably larger excavated cavities per capita compared to solitary living fish. Consequently, group living enables *Neolamprologus obscurus* to efficiently increase the prey abundance in their territory. This increases the body condition and future reproductive success of breeders and/or helpers," adds Tanaka, who suggests that there is a clear benefit to group living for this species of fish.

**More information:** Hirokazu Tanaka et al, Helpers increase food abundance in the territory of a cooperatively breeding fish, *Behavioral Ecology and Sociobiology* (2018). [DOI: 10.1007/s00265-018-2450-5](https://doi.org/10.1007/s00265-018-2450-5)

Citation: Fish team up for more food (2018, March 6) retrieved 10 May 2024 from <https://phys.org/news/2018-03-fish-team-food.html>

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