

# Deep-sea squid uses tentacles to attract prey

Mysterious cephalopod's fragile arms lure its food close enough for killing.

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A few chance encounters hundreds of metres underwater seem to have solved the long-standing mystery of what one squid species does with its unusual tentacles: it pretends they are fish to lure its prey into range.

Until now, the deep-sea-dwelling squid *Grimalditeuthis bonplandi* had never been observed in the wild by researchers, and most of the knowledge about it came from partially digested specimens pulled from the stomachs of large fish and whales. Most squid have a pair of tentacles with hooks or suckers that they use to grasp food, but in this species the corresponding tentacles are thin, fragile things — and their function has puzzled squid researchers.

Henk-Jan Hoving, a squid researcher at the Helmholtz Centre for Ocean Research in Kiel, Germany, and his team obtained videos of seven of these animals seen in the Atlantic and North Pacific. One of the observations came from an expedition run by the Monterey Bay Aquarium Research Institute in Moss Landing, California, and the other videos were made by commercial remotely-operated submersibles used by the oil and gas industry, and later supplied to Hoving and his team.

Hoving and his team saw the squid move the ends of their unique appendages, known as tentacle clubs, in a way that “really looked like a small fish or squid”, he says. They describe their observations in *Proceedings of the Royal Society B*<sup>1</sup>. The movement of these tentacles attracts the crustaceans and other cephalopods that *G. bonplandi* eats. Thinking they are going to get dinner, the prey species move towards the flapping arms, only to be eaten themselves.

“Because nobody has ever observed *Grimalditeuthis* capturing its prey, we cannot say for sure that this behaviour is an aggressive mimic,” says Hoving, referring to the way in which the squid's tentacles actively mimic a prey species, rather than being used defensively for camouflage, for instance. “However, the movements were so striking and so similar to a small marine organism that we could not come up with an alternative explanation for this subtle and unique behaviour.”

*G. bonplandi* is commonly found at depths of 1,000 metres or more, where it is too dark for prey species to see its tentacles because no natural light penetrates that far down. Hoving's team suggests that the squid's mimicry movements could operate by stimulating bioluminescence from surrounding organisms in the water, by creating low-frequency vibrations that other species can hear or by producing a hydrodynamic signal that a prey species would sense as coming from food or a potential mate.

William Gilly, a squid researcher at Stanford University's Hopkins Marine Station in Pacific Grove, California, says that he wonders whether predators of *Grimalditeuthis* might also react to any induced bioluminescence created by the squid, thus putting it at risk. That might suggest that the hydrodynamic lure is a more likely technique for enticing prey — it could be effective over short distances without attracting the attention of any squid predators.

"I think their arguments for the use of the tentacle clubs by *Grimalditeuthis* as a lure are quite convincing, despite the lack of direct evidence," says Gilly.

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## References

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1. Hoving, H. *et al. Proc. R. Soc. B* <http://dx.doi.org/10.1098/rspb.2013.1463> (2013).