

# Cuttlefish choose their battles wisely

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Credit: Prof Roger Hanlon

Male cuttlefish can evaluate the likelihood of winning a fight by assessing their competition, according to a new study.

The study, led by researcher Dr Alex Schnell and published in *Animal Behaviour* demonstrates that male [cuttlefish](#) modify their behavior

through assessing the fighting ability of their opponent relative to their own. The work also provides one of the few definitive examples of mutual assessment in the animal kingdom.

"Animal contests in many species had previously been reported to be resolved through the process of mutual assessment, for example, when competitors use information about their opponent to decide whether to fight or surrender. But recently, several research papers called the validity of such claims into question. By using an integrative research approach in the lab, this study was able to address these concerns and clearly demonstrate that male cuttlefish can assess and then modify their behaviour according to the attributes of their opponent," said Dr Schnell.

The study involved experiments on giant Australian cuttlefish, *Sepia apama*, which are renowned for large mating aggregations where males compete fiercely for females using spectacular colourful displays.

Laboratory-staged contests between the cuttlefish were conducted to test the game theory models, which provide a framework for investigating conflict resolution in animals. The research also investigated the cuttlefishes' motivation to fight and their decision-making abilities during aggressive interactions.

"If a male cuttlefish was challenged by a relatively smaller competitor, he would exhibit a range of aggressive behaviours and fighting displays. Intriguingly, if the same male cuttlefish was challenged by a relatively larger competitor, he would exhibit submissive behaviours, such as fleeing, inking or camouflage patterns," said Dr Schnell.

"This remarkable ability to recognise size differences and then shift from aggressive to submissive behaviours provides compelling evidence for a mutual assessment fighting strategy in these large-brained invertebrates."

Macquarie University co-author, Professor Rob Harcourt, said: "This is a very exciting result, as cephalopods are separated by millions of years of evolution from the more familiar mammals and birds. To see that giant cuttlefish are capable of such complex assessments indicates selection pressures may act in parallel across the biological realms."

The new findings from this study may lay important foundations for investigating more intricate details of cephalopod fighting behaviour and competition. The integrative approach used in this study may also be used to test for mutual assessment in a wide range of visually oriented animals.

**More information:** "Giant Australian cuttlefish use mutual assessment to resolve male-male contests," *Animal Behaviour*, Volume 107, September 2015, Pages 31-40, ISSN 0003-3472, [dx.doi.org/10.1016/j.anbehav.2015.05.026](https://doi.org/10.1016/j.anbehav.2015.05.026)

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