

# Cuttlefish do not bluff in battle

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Two male giant Australian cuttlefish performing the lateral display in an attempt to gain access to a female hiding under the rock. Credit: (c) Roger T. Hanlon

Male cuttlefish do not bluff. When their body language shows they are agitated, they are. This was one of the findings from a study on the giant Australian cuttlefish in Springer's journal *Behavioral Ecology and Sociobiology*, led by Alexandra Schnell of Macquarie University in Australia.

Animals have different ways to show aggression during confrontations. Some animals try avoiding actual hand-to-hand fighting to reduce the risk of injury or even death. They prefer settling differences by using a repertoire of hierarchical agonistic or threat displays that signal their

fighting ability or aggressive intent.

Male giant Australian cuttlefish (*Sepia apama*) are known for their spectacular displays of aggression when jostling over females during the breeding season. These include rapid changes of skin colour and particular body movements. Fights can last up to twenty minutes but, more often than not, they do not include any real physical contact other than a bit of pushing and grappling.

To further investigate the aggressive behavior of cuttlefish, Schnell's team combined field observations with the use of a video playback technique. They found that giant Australian cuttlefish produce multiple displays that convey a graded series of threats during contests between males of the same size. The early stages of such interactions predict which displays will be performed later in a confrontation. In turn, these later displays reliably predict the chances of any physical aggression.

In the field, Schnell's team observed how males gradually progress from the initial low-risk visual signalling stage to the high-risk one, which entails actual physical aggression. Low-risk behavior is typically performed at a distance of more than a meter away, and seldom stimulates [physical aggression](#) in an opponent.

During [video playback](#) sessions, males were shown life-sized videos of other cuttlefish in various stages of aggression. It was found that during the low-risk stage, cuttlefish use frontal displays to assess their opponents' level of aggression. The signaller faces his opponent. His mantle is down and out of sight of the rival, while his arms are typically white and move slowly.

The frontal display reliably predicts whether shovel and lateral displays will subsequently be used to signal greater aggression and a willingness to engage in actual physical battle. During the shovel display, a

cuttlefish's mantle is raised and is visible to its rival. The arms are extended and rigid in a shovel-like shape. In the lateral display, the animal's body and arms are orientated laterally to the opponent's and the fourth arm is broadened. A sequence of contrasting dark and light bands (the so-called "passing cloud" phenomenon) runs over the mantle.

"Such signalling has most likely evolved so that rivals of the same species can communicate varying levels of [aggression](#), providing opponents with numerous opportunities to make tactical decisions about escalating or withdrawing from a contest," explains Schnell. "Rival [cuttlefish](#) are likely to benefit from signalling and receiving multiple displays through the ability to determine the aggressive intent of the opponent and to predict whether an attack is imminent."

Cuttlefish are invertebrates and, so in terms of evolution, far removed from many of the vertebrate species that have been reported to use this type of signaling. Finding these patterns across such diverse groups of organisms suggests that there are strong selective pressures driving animals to use a hierarchy of threat during contests.

**More information:** Alexandra K. Schnell et al, Cuttlefish perform multiple agonistic displays to communicate a hierarchy of threats, *Behavioral Ecology and Sociobiology* (2016). [DOI: 10.1007/s00265-016-2170-7](#)

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