

'Loser effect' evolves separate from fighting ability

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Broad-horned flour beetles. Credit: University of Exeter

The "loser effect—which causes animals to shy away from violence after losing a fight—evolves independently of any change in fighting ability, new research suggests.

Scientists studied male broad-horned flour beetles, which regularly fight over females, to see how long they avoided fights after a defeat.

Most would not start a fight for about four days after a loss, but researchers from the University of Exeter, Okayama University and Tokyo Metropolitan University selectively bred the beetles for a shorter

duration of this loser effect and found that it evolved to be shorter—despite no improvement in fighting prowess.

"Theory predicts that the loser effect should evolve independently of actual fighting ability, but previous tests of this have been limited," said Professor David Hosken, of the Centre for Ecology and Conservation on Exeter's Penryn Campus in Cornwall.

"By selecting males who experienced the loser effect for the shortest time, we were able to breed beetles willing to fight again sooner.

"It is fascinating that these males were no better at fighting. In other words, there is a complete disconnect between actual fighting ability and the duration of the loser effect."

The study, of captive-bred beetles in Japan, paired males of similar sizes and let them interact for an hour, after which a male that had pushed and chased his opponent was recorded as the "winner".

After ten generations, beetles selectively bred for a reduced loser effect returned to pre-defeat levels of aggression and fighting success after three days instead of four.

"It make sense for animals to use past experience to decide whether to engage in a behaviour," said Associate Professor Kensuke Okada, of Okayama University.

"Losing a fight is a useful clue of the likely benefits of further fighting for a particular individual.

"Some species also show a 'winner effect' - being more willing to fight after a victory—but that is not the case among broad-horned [flour beetles](#)."

More information: Loser-effect duration evolves independently of fighting ability, *Proceedings of the Royal Society B*, [rspb.royalsocietypublishing.org1098/rspb.2019.0582](https://royalsocietypublishing.org/doi/10.1098/rspb.2019.0582)

Provided by University of Exeter

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