

Beetles assert dominance by being a lover not a fighter, new research shows

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Beetles assert dominance by being a lover not a fighter. Credit: Matthew Silk

Beetles that demonstrate same-sex sexual behaviour may be asserting dominance over rival males without having to resort to fighting, a new study has shown.

The pioneering new research, produced by scientists at the University of Exeter, has shown that same-sex sexual behaviour (SSB) may help assert an accepted 'pecking order' amongst males for the right to court and mate with females.

The research team observed the behavioural patterns of male broad-horned flour beetles (*Gnathocerus cornutus*) in a controlled lab environment.

They found that within pairs males not only rapidly established fixed dominant or deferential roles during SSB encounters (i.e. who was mounting and who was being mounted), but also displayed lower levels of aggression in comparison to pairs who didn't participate in SSB.

Furthermore, males who were consistently on the receiving end of SSB demonstrated a significantly lower propensity to court females and had a lower mating success than the males who mounted them - echoing similar patterns seen in males that lost fights.

The research is published in leading scientific journal, *Animal Behaviour*.

Sarah Lane, a Biosciences PhD research student from the University of Exeter and lead author of the study said: "We know that same sex sexual behaviour is widespread across the animal kingdom, but evidence for whether or not this behaviour acts to resolve dominance and reduce aggression amongst males is quite limited.

"We therefore tested whether SSB was indeed an extension of male-male competition by observing the relationship between the occurrence of same-sex courtship and acts of aggression, noting whether the beetles switched SSB roles or not. From this, we could determine whether same sex-sexual encounters influenced aggression amongst competing males."

The research team observed 311 pairs of male beetles over the course of one month.

They found that typically, males rapidly establish fixed SSB roles - either dominant or submissive. Furthermore, both the stability of these roles and the number of times these interactions occurred, had a highly significant effect on levels of aggression observed within pairs.

Sarah added: "Pairs in which one male consistently mounted the other showed significantly lower levels of [aggression](#) than in pairs in which neither male exhibited SSB or in which males continuously switched SSB roles and attempted to mount each other.

"Males who were consistently on the receiving end of SSB demonstrated lower propensity to court females and had a lower mating success than active males.

"The same characteristics are also seen in loser males as a result of fighting. Males who lost fights were less likely to court females and had lower mating success than males who won fights."

"Our findings provide the first empirical support for the hypothesis that same-sex sexual behaviour is an extension of male-male competition. They also suggest that SSB may act as a non-injurious display, allowing [males](#) to resolve dominance hierarchies without escalating into an injurious fight."

More information: Sarah M. Lane et al. Same-sex sexual behaviour as a dominance display, *Animal Behaviour* (2016). [DOI: 10.1016/j.anbehav.2016.01.005](#)

Provided by University of Exeter

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