

Spider mites study: Social environment experienced by mothers influences sons' reproductive tactics

August 22 2023



Credit: University of Tsukuba

In the intense male–male competition for females, males often develop alternative reproductive tactics to achieve successful reproduction through unconventional means. These tactics often arise from their own

condition and surroundings.

However, if [mothers](#) can predict the situations their sons will encounter based on their own condition and the surrounding environment, maternal effects are likely to play a significant role in their sons' reproductive tactics. These findings have been published in the journal *Behavioral Ecology and Sociobiology*.

In this study, researchers focused on the [social environment](#), such as the sex ratio, as a predictor of the intensity of male–male competition. The researchers discovered that in the case of two-spotted spider mites when the sex ratio of the maternal generation is biased toward females, their sons display sneaking tactics and often show early pre-mating guarding.

When confronted with a female-biased sex ratio, mothers produce more sons than usual, resulting in more males in the next generation and increased intensity of male–male competition. The male mites mount on the back of the females in the stage just before adulthood as a pre-mating guard.

There are two types of males: "fighters," who guard females by fighting, and "sneakers," who do not behave as males and secure a position advantageous for mating without fighting. However, sneakers cannot take over females that are already guarded. Therefore, in situations with more rival males, sneakers will begin pre-mating guarding at an earlier stage.

This [behavior](#) can be attributed to mothers predicting male–male competition in their son's generation based on the [sex ratio](#) of their environment and manipulating their son's reproductive behavior to ensure their [reproductive success](#).

More information: Yukie Sato et al, The operational sex ratio

experienced by mothers modulates the expression of sons' alternative reproductive tactics in spider mites, *Behavioral Ecology and Sociobiology* (2023). [DOI: 10.1007/s00265-023-03370-2](https://doi.org/10.1007/s00265-023-03370-2)

Provided by University of Tsukuba

Citation: Spider mites study: Social environment experienced by mothers influences sons' reproductive tactics (2023, August 22) retrieved 27 April 2024 from <https://phys.org/news/2023-08-spider-mites-social-environment-experienced.html>

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