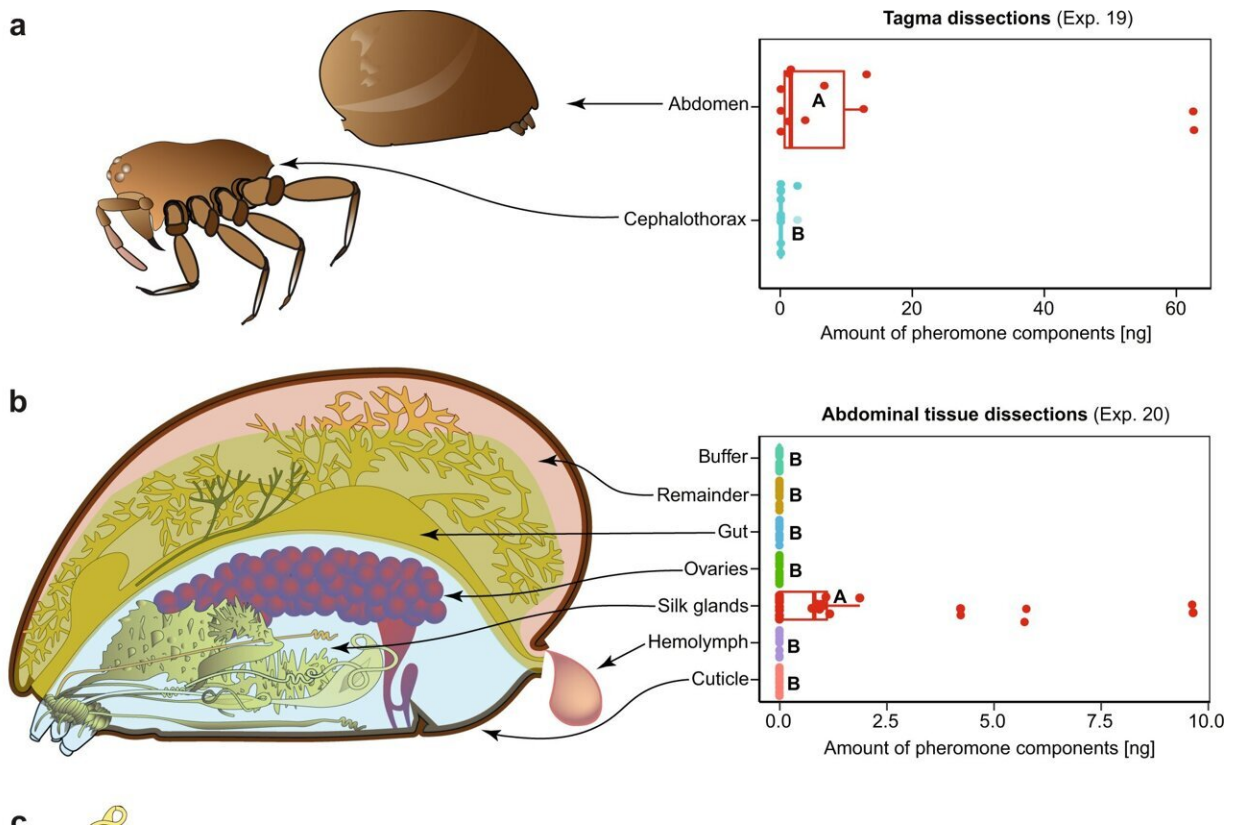


How female false widow spiders use their 'spidey senses' to attract mates—study

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Origin of contact pheromone components produced by female *Steatoda grossa*.
 Credit: *Communications Biology* (2022). DOI: 10.1038/s42003-022-04072-7

When it comes to spider love, female widow spiders hold the key to attracting mates, potentially adjusting their web's attractiveness to lure

males, according to new research.

A study led by Simon Fraser University's resident "[spider](#) man," Ph.D. candidate Andreas Fischer, reveals new details about how female false widow spiders (*Steatoda grossa*) communicate using pheromones—and suggests they can build more attractive webs— to lure mate-seeking males by adjusting the pH level of their pheromone-bearing silk.

Female false widow spiders disseminate pheromone from their webs to attract males and deposit contact pheromone components on their webs that induce courtship by the males once they arrive.

This latest research, published this week in the journal [Nature Communications Biology](#), also identifies the organ that produces these pheromone components—the posterior aggregate silk gland—as well as the chemical structure of the pheromone components involved in attraction and courtship.

"We also found that female false widow spiders have a sophisticated method to constantly 'mate call' by slowly breaking down the courtship-inducing pheromone components to sex attractant pheromone components that lures the males in," says Fischer, who carries out research in the Department of Biological Sciences' Gries-lab.

False widow spiders are globally invasive and capable of reproducing year-round but little is known about the reproductive behavior of this common species of spider, also sometimes called the cupboard spider, which predominantly lives in buildings.

Method of study

In their latest study, 93 sexually mature, adult virgin female false widow spiders spun webs on wooden triangular prism scaffolds or bamboo

skewers. For comparison, 70 immature sub-adult females were also allowed to build webs, though only mature females are known to produce pheromones.

Their webs were then deposited into a glass vial for laboratory analysis. Then, the various pheromone components were identified using the latest state-of-the-art technology, custom created in the laboratory, and tested for their ability to attract and induce courtship behavior in male false [widow](#) spiders.

Can female false widow spiders control their attractiveness to males?

Researchers suggest that female spiders may be able to actively adjust the attractiveness of their web to [males](#). Female spiders can adjust the pH level in their silk and this ability may allow them to actively control the enzyme involved in the transition of contact, courtship-inducing pheromone components to mate attractant pheromone components.

Currently, only insects are known to actively time pheromone production and dissemination, and to modulate the amount of [pheromone](#) they emit. Arachnids, such as web-building spiders, may be able to do this as well but future study is needed to determine if this is the case.

Male [false widow spiders](#) will die shortly after mating. The female will lay three or more egg sacs or cocoons containing 200 eggs each that hatch within two to four months.

More information: Andreas Fischer et al, Origin, structure and functional transition of sex pheromone components in a false widow spider, *Communications Biology* (2022). [DOI: 10.1038/s42003-022-04072-7](#)

Provided by Simon Fraser University

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