

Male nursery web spiders may be adding chemicals to silk to make nuptial gifts more attractive to females

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New Zealand Nursery Web Spider *Dolomedes minor*, Adult male, sitting on water waiting for prey. Credit: Bryce McQuillan/Wikimedia Commons CC BY 2.0

A trio of researchers with Ludwig-Maximilians-University of Munich, has found that male nursery web spiders may add chemicals to their silk to make their nuptial gifts more attractive to prospective female mates. In their paper published in the journal *Biology Letters*, Michelle Beyer, Julia Mangliers and Cristina Tuni, describe their study of *Pisaura mirabilis*, also known as the nursery spider, and its mating habits.

As the researchers note, [chemical](#) communication plays an important role in mating for many species of animals. Prior research has shown, for example, that [female spiders](#) quite often add chemicals to their silks to attract mates. Much less is known about whether male spiders do the same. In this new effort, the researchers conducted an experiment to find out if that might be the case.

One of the critical parts of courtship for nursery web spiders is the nuptial gift. The male captures a fly or other insect and wraps it in his silk, which he then presents to the female as a means of initiating copulation. The female has the option of accepting the offer or rejecting it. Prior research has shown that if the male is rejected, he will typically rewrap the gift and present it again—and quite often find it accepted on the second try. If the gift is accepted, the female tears it open and begins eating the food inside while the male initiates mating. Noting that [female nursery](#) web spiders have poor eyesight, the researchers wondered if something besides appearance might be making a rewrapped package more attractive. To find out they obtained several [nuptial gifts](#) made by male spiders and then presented them to females under varied conditions.

The conditions involved treating some of the silk covering of some of the gifts with a solvent to remove any chemicals the male might have added, both those that were accepted on the first try, and those accepted on a second. They found that washing the [gift](#) made it much less attractive to the female, strongly suggesting that it was the chemicals the

male added that made it attractive to her.

More information: Michelle Beyer et al, Silk-borne chemicals of spider nuptial gifts elicit female gift acceptance, *Biology Letters* (2021).
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