

Mating mix-up with wrong fly lowers libido for Mr. Right

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First spotted in the US in the early 1980s, a sexually confused fruit fly called *Drosophila subobscura* may have contributed to a collapse in native fruit flies through misdirected mating attempts. Credit: Malcolm Storey, bioimages.org.uk/

If you've ever suffered through a nightmare date and were hesitant to try again, fruit flies can relate.

Female fruit flies that have been coerced into sex by invasive males of the wrong species produce fewer offspring and are less likely to reproduce with their own kind, finds a new study.

Invasive species are known to threaten native biodiversity by bringing in new diseases, preying on resident species, or outcompeting them for food or other resources. But this study shows invasives pose a risk through unwelcome romantic advances, too.

"We don't tend to think about misdirected mating attempts driving animals to extinction," said study author Mohamed Noor, a biology professor at Duke University.

When you're a female *Drosophila persimilis* fruit fly, a blind date horror story goes something like this:

A stranger approaches and gives you a tap. He flashes a wing and offers up a drop of vomit. You try to sidestep or turn away, but he badgers you from front to back. Eventually he chases you down and climbs on your back. You try to resist his ardent advances and kick him off, but he persists.

When it's over, persimilis females are done with love. Not even males of their own kind can woo them again, at least for a while, the researchers report. "These aren't voluntary matings," Noor said.

Noor was collecting wild fruit flies in Washington state in the 1990s when he noticed something odd: a species called *Drosophila persimilis*, once abundant in the area, was almost nowhere to be found. In its place was a small brownish-black fly called *Drosophila subobscura*.



Males of an invasive fruit fly called *Drosophila subobscura* may be contributing to the decline of native fruit fly species through unwelcome romantic advances. Credit: Malcolm Storey, bioimages.org.uk/

Native to the Mediterranean, *subobscura* was first spotted in North America in the early 1980s. It started breeding and quickly spread up and down the west coast of Canada and the United States. By the mid-1990's, it had become one of the most common [fruit flies](#) in the area, outnumbering its native cousins.

Subobscura males aren't choosy about their mates. They will even attempt to copulate with tiny fly-sized lumps of wax, provided they're jiggled to look alive. Perhaps, Noor reasoned, these invaders' romantic blunders were contributing to the decline of native flies.

Back at Duke, Noor and his team put 66 native *persimilis* females in one of two situations. Forty-two females were placed in vials with non-native *subobscura* males, one pair per vial. The rest were paired with *persimilis* males.

After watching each vial for an hour, the researchers documented 14 forced copulations among the mixed trials. Despite the females' best efforts to fend off their foreign suitors, forced matings between species were just as frequent and lasted twice as long as consensual sex between *persimilis* pairs.

The misdirected mating attempts produced no offspring, but a second round of trials revealed that native *persimilis* females that had been sexually harassed by non-natives were less likely to remate with their own species several hours later.

Though the exact reasons for their reluctance are unknown, many fruit fly females have an allergic reaction to other *Drosophila* species' sperm, suffering abdominal swelling and sometimes infertility.

The researchers also put flies of both species in vials and counted the number of offspring produced over 28 days. They found that *persimilis*

females confined with males of both [species](#) produced fewer offspring than those confined with their own males alone.

In contrast, native persimilis [males](#) take little interest in invasive subobscura [females](#), so the invaders aren't affected in the same way, Noor said.

More information: Brenda Manzano-Winkler et al, Reproductive interference by male on female: A laboratory experiment, *Ecology and Evolution* (2017). [DOI: 10.1002/ece3.2855](https://doi.org/10.1002/ece3.2855)

Provided by Duke University

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