

En garde! Wasps use penis spikes to ward off predators

December 25 2022, by Sara HUSSEIN



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An accidental sting has helped Japanese scientists prove some male wasps have a rather unusual predator defence weapon: penis spikes.

While wasps are known for their prickly attacks, only females have a real sting in their tails. Their [male counterparts](#) generally evade predators by mimicking the fairer sex.

Scientists had theorised that some male wasps might have other defence mechanisms, including perhaps deploying their genital spikes.

"However, the evidence was lacking," explained Shinji Sugiura, an ecologist at Japan's Kobe University.

Sugiura studies animal anti-predator defences but it was only by chance that he investigated the unusual male wasp mechanism, after his graduate student and co-author reported being stung by a mason wasp.

"I tried to be stung after hearing her experience," Sugiura told AFP.

"Because I had believed male wasps as harmless, I was very surprised to experience the pain."

Female wasps sting via an ovipositor, a tube-like protrusion that deposits eggs but can also deliver a venomous riposte.

Male wasps lack the organ but are equipped with two large spikes that sit either side of their penis.

To test the effectiveness of this defence, Sugiura's team offered up male mason wasps to two different kinds of frogs to see how the spikes were deployed.

"Male wasps were frequently observed to pierce the mouth or other parts of frogs with their genitalia while being attacked," Sugiura reported in research published Tuesday in the *Current Biology* journal.

The attacks are documented in a video that shows an unfortunate [frog](#) trying repeatedly to chomp down on a wasp, before using its front feet to pull the stinging insect out of its mouth.

Pond frogs happily ate all the males, as well as stinging females, but over a third of tree frogs rejected the male wasps after being stung.

When the experiment was repeated with the genital spikes removed from the [wasps](#), the tree frogs no longer held back and ate them without hesitation.

"The difference was statistically significant. Even a small difference of survival could cause the evolution of anti-predator devices in insects," Sugiura said.

There has been little research on insect genitalia outside of its role in reproduction, according to Sugiura, though the wasp defence mechanism is not entirely without precedent.

Previous research has found, for example, that some species of hawkmoth use their genitalia to emit ultrasound that jams bat sonar.

Sugiura is no stranger to uncovering some of the weirdest ways animals evade their predators.

He has documented how some beetles can escape after being swallowed, by following the [digestive tract](#) to its logical conclusion and escaping from the anus.

And he has shown that other insects can make any unfortunate toad that has eaten them vomit them back up.

He now hopes to expand his current research to determine whether other

wasp families have the same genital [spike](#) defence mechanism.

More information: Shinji Sugiura, Wasp male genitalia as an anti-predator defense, *Current Biology* (2022). [DOI: 10.1016/j.cub.2022.11.030](#)

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