

Europe's first samurai wasps found in stink bug eggs

January 8 2019



Credit: Macro Photography from Pexels

Food crops are continuously threatened by invasive pest species. One such pest that began to appear in Europe over the last decade or so is the *Halyomorpha halys*, commonly known as the brown marmorated stink

bug. Native to eastern Asia, the bug is highly polyphagous, feeding on more than 170 plant species – including tree fruit, nuts, vegetables and field crops – and causing significant crop damage every year. To date, broad-spectrum insecticides have been the most common way of managing *H. halys*. However, food safety and ecosystem health concerns have made finding more environmentally friendly and sustainable control measures imperative. A promising solution is the biological control of this agricultural pest using one of its natural enemies.

First samurai wasps found in Switzerland

Research conducted in the course of the EU-funded project BINGO has led to the discovery that *Trissolcus japonicus*, a natural enemy of *H. halys*, is already present in apple orchards in the Canton Ticino, in south-eastern Switzerland. This is the first time that *T. japonicus*, commonly known as the samurai wasp, was recovered from *H. halys* egg masses in Europe. A paper published in the *Journal of Pest Science* provides details on this discovery.

"It is difficult to say for certain how *Trissolcus japonicus* arrived in Switzerland – the 2mm big wasp was probably accidentally transported from its native range along with the pest," says co-author Dr. Tim Haye in a news item posted on the EurekAlert! website. "But whether Switzerland was the actual country of introduction or whether the wasp was introduced into the climatically highly-suitable northern Italy before spreading northwards remains unclear," adds Dr. Haye, who is also a researcher at project partner Centre for Agriculture and Bioscience International.

Promising research findings

The *T. japonicus* wasp is native to China, Japan and South Korea, where

the *H. halys* [stink bug](#) is also native. It's an egg parasitoid of the stink bug, meaning that its larvae feed and develop inside the [eggs](#) the host lays, eventually killing them. In its native range, *T. japonicus* is the dominant egg parasitoid of *H. halys* and is therefore considered a classical biological control agent in invaded regions.

As the paper reports, the wasp is now established in Switzerland and was found in three different sites over two consecutive years. During the study, the BINGO researchers recovered 17 egg masses from which 42 adult parasitoids emerged. While current samurai wasp populations may still be very low (at most 2 %), it's still too early to assess the impact of such populations on the invasive stink bug species in Switzerland. In north-eastern China, parasitism rates have ranged between 50 % and 90 %. Given these high levels of parasitism of *H. halys* eggs, the establishment of *T. japonicus* may be able to "reduce invasive stink bug densities below economic thresholds," as the authors report in the paper.

BINGO (Breeding Invertebrates for Next Generation BioControl (BINGO)) will be continuing its research on the use of biological agents to reduce the impact of invasive and endemic agricultural pests. More *H. halys* egg masses will be collected to determine Samurai wasp distribution and the effects of egg mortality on *H. halys* and native stink bug populations in the near future.

More information: BINGO project website: www.bingo-itn.eu/en/bingo.htm

Provided by CORDIS

Citation: Europe's first samurai wasps found in stink bug eggs (2019, January 8) retrieved 11 July 2024 from <https://phys.org/news/2019-01-europe-samurai-wasps-bug-eggs.html>

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