

Bugs & Slugs:



OÉ Gaillimh
NUI Galway

Biological control & sustainable agriculture in Ireland

What's the problem?

A large portion of the Irish economy is based on agriculture. Most Irish agriculture is grazing and silage, but cereal and vegetable crops make up nearly 10% (or €1.4 billion every year!). Since Ireland is temperate and gets a lot of rain, slugs are a big problem for farmers. Chemical pesticides (slug pellets) to kill slugs that damage crops have been used by farmers for many years, but these pellets contain harsh chemicals that can get into waterways and kill other animals. Because of this, the most common type of slug pellet was banned by the EU Commission in 2014 (EU Regulation No. 187/2014), and farmers must now find alternative methods for protecting their crops against slug damage. While there are other chemical options farmers can use, there are also natural alternatives that can be employed for a more environmentally-friendly and sustainable approach for farms.

What is our research about?

Our research focuses on natural options for controlling slugs on farms. Specifically, we work with a species of marsh fly (*Tetanocera elata*) which kills the grey field slug (*Deroceras reticulatum*), one of the most damaging agricultural pest slugs. In its early juvenile stage, *Tetanocera elata* parasitizes the slugs, using it as a host. As it grows, its initial host dies, and the final juvenile stage is free-living and predatory. It hunts slugs actively, and can kill up to 12 slugs before becoming an adult fly. Adults don't hunt slugs, instead feeding on sugary foods.

We are working with *Tetanocera elata* in the hopes that this fly will provide a natural control of slugs on farms that are damaging crops. It is native in Ireland, and could be well-suited for farm ecosystems. Currently, we are collecting flies from their natural habitats and raising them in the laboratory (NUI Galway) and testing what both juveniles and adults eat. We are also sequencing the DNA of flies to get an idea of how populations are similar to and different from other populations in different areas of Ireland (and throughout Europe), and examining their habitats to get an idea of their ecological requirements. Once we better understand the biological needs of these flies, we can introduce them into agricultural ecosystems in such a way that they are self-sustaining, providing a low-effort, low-cost, and ecologically-friendly option for slug control for farmers.



Adult *Tetanocera elata*.
Photo credit: Nikita Vikhrev

Why is finding *Tetanocera elata* exciting?

While *Tetanocera elata* is widespread throughout Ireland, it can be difficult to find in large numbers. Our research, and the feasibility of using these flies on farms to combat pest slugs, relies on our ability to locate them in nature to breed in the lab. So the more flies we find, the more research we can do! In some places where we find *Tetanocera elata*, we might only find 2 or 3 over the course of a whole summer, so every location counts!



Juvenile *Tetanocera elata* feeding on a grey field slug (*Deroceras reticulatum*).

What can you do?

Let the grass grow! *Tetanocera elata* likes to live in areas with long vegetation, like overgrown grassy fields. These flies live in fairly dry places, but it has to be damp enough for there to be slugs. It also helps if there is a hedgerow or treeline along the boundary of the field to give them shelter. If you know of a field or meadow that was once used for grazing or agriculture, but has not been managed in several years, let us know! We would be grateful for the chance to see if our fly is there! Any collecting we do is low-impact, and the plants and other insects and animals in the fields are left undisturbed.

Get in touch!

For more information on the project, or to let us know about a field you think would be appropriate, get in touch with us! We're happy to answer any questions about our research, and even to send out materials or give educational talks to interested school or community groups. You can learn about our researchers by going to the NUIG Applied Ecology Unit website: www.nuigalway.ie/applied_ecology_unit.

And to get in touch with us, ring the Applied Ecology Unit at 091-492-719.



An ideal habitat for *Tetanocera elata*: an ungrazed grassy meadow surrounded by hedgerow.



IRISH RESEARCH COUNCIL
An Chomhairle um Thaighde in Éirinn