

CONTROLLING EARWIGS IN THE FALKLANDS

Locations	Falkland Islands (Malvinas)
Dates	01/04/2013 - 31/03/2017

Summary

The European earwig has become a considerable domestic and public nuisance in the Falkland Islands, causing significant problems for local horticulture by decimating many garden vegetable crops. This population explosion is due to the absence of natural enemies that would normally keep them under control. To try and find a solution to this problem, CABI is investigating the possibility of using two parasitic fly species to control the earwigs in a biological way.

The problem

The European earwig (*Forficula auricularia*) was only recently introduced to the Falkland Islands and has become a considerable domestic and public nuisance, especially around Port Stanley and Mount Pleasant Airport. The earwigs are causing significant problems for local horticulture by decimating many garden vegetable crops. This population explosion is due to the absence of natural enemies that would normally keep them under control. In contrast, earwigs in the

UK are attacked by many generalist predators including spiders, beetles, frogs, toads and specific parasitic insects (or parasitoids). In the Falkland Islands, these parasitoids do not naturally occur.

What we are doing

To try and find a solution to this problem, CABI is investigating the potential to control the earwigs in a biological way. The European earwig is as a well suited target for this type of control and the decision to go ahead and do this was made at a workshop in the capital, Port Stanley.

For this, we are focussing on two parasitic fly species, *Triarthria setipennis* and *Ocytata pallipes*. We believe these are both highly specialized and only attack earwigs. To develop a good breeding culture of these parasitoids that could be used for a future release, CABI scientists firstly need to trap earwigs at sites around the UK. They can then be taken back to our laboratories to be looked after.

As the Falkland Islands have no native earwig species (*Dermaptera*), the risk of anything being affected apart from the target pest is very low. However, how specific both these parasitoids are to the target, the European earwig, is relatively unknown. The first phase of the project therefore focused on studying the range of possible effects they have on other related insects. In the case of the Falklands, these tests can be restricted to related insects with a similar ecology to earwigs. So, crickets and cockroaches for instance are being tested for to ensure they are not attacked by either of the two parasitoids.

Results so far

Initially, a team from CABI trapped earwigs in several orchards throughout England. We located the traps in fruit trees and were able to collect more than 70,000 earwigs between 2013 and 2015.

We successfully carried out tests on the two parasitic flies to see what other insects they can attack or develop on (host range testing). Fortunately, none of the insects we tested showed any signs of parasitoid development, even when we artificially increased their exposure to the flies, to a degree, which they wouldn't naturally have. As a result, a decision was made to release both of the parasitoid fly species in the Falkland Islands.

With additional support from the Darwin Initiative, we are currently undertaking trials to establish *Triarthria setipennis* and *Ocytata pallipes* in Port Stanley.

One of the fly species, *T. setipennis*, has already been introduced and is successfully controlling earwigs in the USA and Canada. So far however, attempts to achieve this for the other parasitic fly, *O. pallipes*, have failed. Despite the fact that the flies will have to switch their lifecycle from northern to southern hemisphere seasons, our better understanding of both the flies' biology means that the team is now confident that both the fly species can be introduced to successfully tackle the European earwig pest in the Falkland Islands.

The benefits and safety of biological control were demonstrated through various awareness-raising activities which helped overcome the scepticism towards this sustainable and environmentally friendly control method. After thorough safety tests, administrative institutions and the wider public endorsed the release of two tachinid fly species for the control of earwigs. Both species could be successfully reared in the UK, shipped to the Falkland Islands and released in Stanley, the centre of the earwig infestation. Establishment of the control agents and the impact on their target remains unclear at this stage.

Donors

Darwin Plus, Falkland Island Government

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