Wasp biocontrol update 21 September 2020

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Wasp Biocontrol Phase II project.

EPA application

An application has been submitted to the EPA for releasing two promising biological control agents, *Volucella inanis* and *Metoecus paradoxus,* from containment. While we did not get as much input as we would have liked from potential submitters, the input we did receive was valuable and the consultation process has been very positive overall. Back in June the EPA was sent an early draft which they were kind enough to suggest areas that needed strengthening before we formally submit. After a few rounds, with *a lot* of help and guidance from my colleagues Angela Bownes and Richard Hill, we have been pushing hard to get the application in shape. I would really like to thank Angela and Richard for all their hard work and moral support. The application was formally acknowledged by EPA on 14 September, kicking off the formal procedure clock. It is thrilling to think that if everything goes well, we very well could be releasing these two agents this coming summer!

Agent rearing

In related news, with no international travel the team will still be able to receive consignments of agents collected by colleagues in the UK. This will be important this year since rearing them in containment has been challenging.

The wasp nest beetle, *M*. *paradoxus*, gave false hope this past season. We were able to get them to mate and lay eggs in captivity, but the eggs did not survive the simulated overwintering. Hopefully the new incubators will help with future attempts. Colleagues overseas were already starting to collect some of these beetles in early July, so with any luck they will be able to send me some eggs to try again.

This has been by far the best year for rearing *Volucella*. Compared with previous years, we had a very high emergence rate for all three species. *Volucella pellucens* was the first to emerge in mid-March (72 adults). There was a tiny bit of overlap with *V*. *zonaria*, which emerged from late-March through mid-April (93 adults). And finally, the *V. inanis* began emerging in early April and the odd ones are still just beginning to pupate (30 adults, so far). Not sure how, but they are. So, the good news is that we have been successful at figuring out how to simulate their overwintering. The not-so-good news is that we still cannot get the conditions right to trigger them to mate. This family of flies (Syrphidae) are rather notorious for their difficulty to rear in laboratory conditions. After speaking with several researchers that have tried rearing hoverflies, it sounds like the key will be to get them into natural sunlight. Unfortunately, this is challenging to achieve in containment.

Our current thinking regarding future mass production of these hoverflies will be to do some semi-natural releases in shade houses and glass houses in order to get them to mate. In the UK, it was possible to get the females to lay eggs by placing the females in a vented vial and having them near a wasp nest as it was being excavated. Assuming the sight, sounds and smell of the workers triggered her to oviposit. Since there seems to be no shortage of wasp nests, finding enough food to rear the larvae on should be straightforward. On the other hand, there could be an argument to release all the adults that emerge in the hope to get at least some establishment. However once released the males may have difficulty finding the females at such low numbers. Particularly since these flies can cover very large distances as witnessed by migrations across the English Channel. In the first year of release a balance of both approaches and plan to release roughly half of the emerged adults to the wild and keep the other half to attempt mass production.

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