

Hyperparasites of Aphid Parasitic Wasps

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What are hyperparasites?

Hyperparasites are secondary parasites of primary parasitic wasps. They seek out aphids that have already been parasitized by a parasitic wasp. The hyperparasite lays an egg inside the aphid, within or near the egg of the parasitic wasp. The immature hyperparasite feeds on the parasitic wasp, eventually killing the parasite before it emerges. Hyperparasites occur naturally and usually are found in higher numbers in late summer when conditions are favorable for them and their host (the parasitic wasp). Hyperparasites can disrupt the effectiveness of an aphid biological control program using *Aphidius* spp. particularly in banker plant systems. There are numerous species of hyperparasites, and they are difficult to identify, requiring the assistance of a specialist. In North America, most common hyperparasites of parasites attacking cereal aphids are *Dendrocerus* spp. (usually *Dendrocerus carpenteri*) and *Alloxysta* spp.



Adult hyperparasite: *Alloxysta* spp.
Photo from: <http://www.cedarcreek.umn.edu/insects/album/025033002ap.html>



Adult hyperparasite: *Dendrocerus* sp.
Photo by pbertner



Adult parasite:
Aphidius colemani

How do I know if I have hyperparasites?

It is difficult to know by looking at it if an aphid mummy has been attacked by a hyperparasite. However it can be confirmed after they emerge based on the shape of the exit hole they make. An aphid parasite such as *Aphidius* spp. leave a perfectly round exit hole with a smooth edge in the mummy. Hyperparasites make an exit hole that is not exactly round with jagged margins. It is hard to distinguish adult hyperparasites from parasites. Hyperparasites usually have a stocky body and tend to fly in a zig zag pattern when searching for their host. *Aphidius* spp. have a longer, more slender body than their hyperparasites.

How do I get rid of them?

Hyperparasites occur naturally in New England and enter greenhouses from outside. It is almost impossible to eliminate them entirely. However, their impact on aphid parasites can be minimized by following these guidelines:

1. If banker plant systems are used for aphid management, remove them from the greenhouse in late August to eliminate the source of aphid hosts for hyperparasites.
2. If possible, leave the greenhouse empty for a few months over the winter to reduce aphid numbers that serve as hyperparasite hosts.
3. Shift from parasites to other biological control agents to manage an aphid infestation. For example, several predators are effective against aphids (*Aphidoletes* spp., ladybeetles, lacewings and others).



Aphid mummy with parasite exit hole
(note round shape and even margin).

http://nathistoc.bio.uci.edu/hymenopt/Aphidius_files/37.jpg



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Aphid mummy with hyperparasite exit hole
(note uneven shape and jagged edge).

If you have additional questions, contact:

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