



***Pediobius foveolatus* – A parasitoid of the Mexican bean beetle**

Order: Hymenoptera, Family: Eulophidae

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Pediobius foveolatus (Fig. 1), is a tiny exotic parasitoid wasp that is used as a biological control agent for Mexican bean beetle, an important defoliating pest of beans in Virginia (for more information about this pest see Nottingham & Kuhar 2013. VCE Pub. No. ENTO-51).

P. foveolatus was discovered in India, and is native to most of southern Asia and Japan. In their native range, the wasps either overwinter in host larvae, or not at all due to the lack of a cold season. In the United States, however, *P. foveolatus* cannot survive cold winter months because all North American *Epilachna* hosts (Mexican bean beetle and Squash beetle) overwinter as adults, not larvae. Therefore, these wasps die off each winter, and must be released annually in order to provide ongoing control of Mexican bean beetle in the United



Fig 2. Parasitized Mexican bean beetle larva
Photo by L. Nottingham

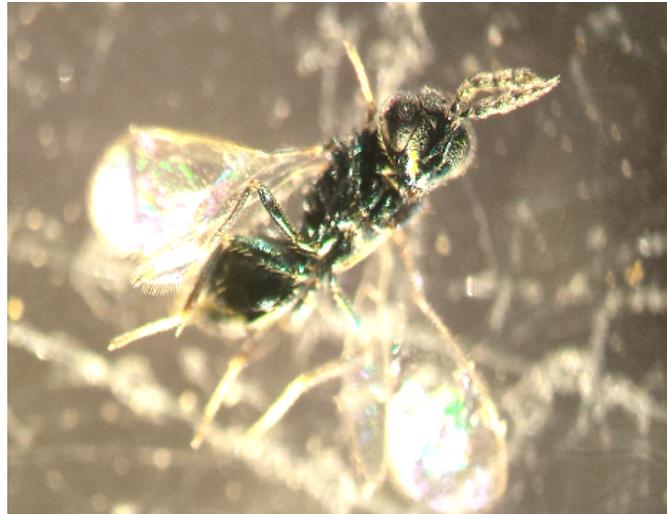


Fig 1. *Pediobius foveolatus* adult.
Photo by L. Nottingham.

States. Wasps are mass produced by the New Jersey Department of Agriculture and other commercial insectaries. They can be purchased from certain vendors that supply biological control agents.

Female wasps lay around 20 eggs in a single beetle larva. The wasp larvae hatching from these eggs kill the beetle larva. Parasitized Mexican bean beetle larvae eventually turn brown (Fig. 2). Adult wasps emerge from the larvae after about 15 days, mate, and search for more beetle larvae to parasitize. *Pediobius* wasps will also parasitize the larvae of squash beetle, *Epilachna borealis*, a closely related

species that feeds on cucurbit crops. These wasps are extremely small, about 1-2mm long (Fig. 3), and will not harm humans, beneficial insects, or any organisms outside the beetle genus *Epilachna*.

To successfully manage Mexican bean beetle using *P. foveolatus*, it is crucial to properly schedule the release. Ideally, wasps should be released at both one and two weeks after first instar beetles are discovered in beans. Accurate scouting and timing of release is necessary because wasps reproduce most successfully within the third and fourth instars of beetle larvae; so it is imperative that those Mexican bean beetle instars are present when wasps are released. It is also important not to release wasps when it is raining or cold, as they are not well adapted to these conditions. Release wasps at a rate of 1000 wasps (or 50 mummies) per 3600 square feet of beans. Successful parasitism and emergence of the next generation of wasps can be visibly monitored by the presence of dark-brown, dead Mexican bean beetle larvae (“mummies”), with one small hole from which adult wasps exited.

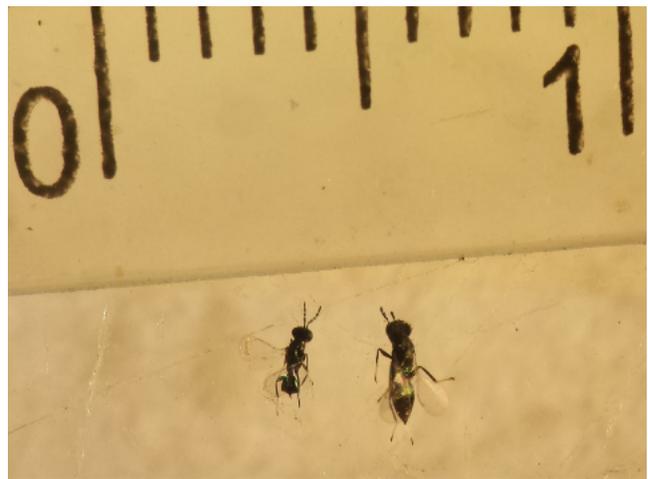
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**Fig 3. *Pediobius foveolatus* Adults,
Photo by L. Nottingham**