
Host suitability for *Aphidius colemani* (Hymenoptera: Braconidae): Can host origin influence parasitoid's choice and progeny fitness?

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Abstract

Plant diversity in agroecosystems is known to increase the stability of communities and the ecosystem service of biocontrol, through providing refuges and different food resources for alternative hosts and for pest natural enemies. Alternative hosts could allow parasitoids to overwinter, favoring an early colonization of target crops, then increasing the attack of pest hosts. However, it is necessary to check whether this transition between two host species by parasitoids affect the host-searching behavior of the female parasitoid and the fitness of the first generation in the target host species. The aphid species *Myzus persicae* on peach orchards and *Rhopalosiphum padi* in cereals share natural enemies, such as the parasitoid *Aphidius colemani*. During winter months in Chile, *R. padi* is parasitized by *A. colemani* on the first stages of winter grasses, being able to act as a refuge for parasitoids to ensure the early arrival of *A. colemani* to peach orchards for the control of *M. persicae*. It is hypothesized that there is no host preference by *A. colemani*, regardless the host of origin, and that both aphid species represent equal quality hosts for *A. colemani*. To test these hypotheses, we evaluated the host preference and performance of *A. colemani* collected from *R. padi* in cereals and *M. persicae* in peaches, through different behaviors and fitness traits as parasitism rate, progeny survival and developmental time. Our results showed preference of females *A. colemani* to one aphid host (*R. padi*) regardless of the host of origin. Higher defensive behavior of *M. persicae* could be an explanation for its less profitability. Despite differences, both aphid species are suitable for development. Further investigation of the interactions among *A. colemani* and both *M. persicae* and *R. padi*, are therefore important for the implementation of this biocontrol method.

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