Public Abstract

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Title:Mechanisms of non-consumptive effects of parasitoid wasps on aphid populations: Enhancing aphid suppression by increasing natural enemy and plant diversity

Efforts to control insect herbivore populations commonly focus on predators and parasitoids, which consume prey. However, any organism in a community can contribute to herbivore suppression if the herbivore inaccurately perceives it as a threat and engages in costly defensive responses. The goal of my dissertation research was to determine whether parasitoid wasps not capable of consuming aphids, i.e. non-enemies, contribute to the biological control of aphids. My research documents that 1) aphids differ in their defensive responses to two closely-related species of parasitoid wasp and can therefore distinguish between the two species, 2) a non-enemy parasitoid not capable of consuming a species of aphid can contribute to long-term aphid suppression, and 3) increasing the plant and herbivore diversity in a field setting leads to greater suppression of aphid population size through increased behavioral interactions between aphids and multiple species of non-enemies. My work demonstrates that non-lethal non-enemy organisms in the environment have an important role to play in influencing herbivore abundance, and that the addition of non-enemies to a community of lethal predators can lead to greater and more consistent suppression of herbivores in the long term.