
Effects of cereal-legume intercropping on sugar consumption and parasitism by *Aphidius* parasitoids

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Abstract

Most parasitoid wasps rely on plant-derived food sources such as nectar, to ensure their survival and dispersal. However, in conventional single crop farming, flower resources are scarce and often restricted to the border of fields. Lack of such resources leads to a lower abundance and performance of parasitoids, especially in the centre of the fields. There has recently been a growing interest in field diversification, for various purposes, and notably as a way to provide food sources for parasitoids. For instance, intercropping allows mixing crops that do not produce such resources (e.g. wheat) with crops such as faba bean, which produces extrafloral nectar on which parasitoids can feed as demonstrated in laboratory bioassays. Nectar provision in intercropped fields may then allow increased food consumption by parasitoids, leading to better parasitoid performances and parasitism, thus increasing pest population control. Here, we studied sugar uptake and parasitism patterns of *Aphidius* aphid parasitoids in wheat single crops and wheat-faba bean intercrops. We tested the hypotheses that a) *Aphidius* parasitoids feed more in intercrops than in single crops and b) increased nectar consumption in intercropped fields leads to higher aphid parasitism. Parasitoid captures and parasitism surveys were carried out in an organic field network around Angers, France. Several sampling points were made at different positions in the field (center, border) to consider nectar uptake outside the field. Feeding history of field-caught parasitoids was inferred from their sugar profile, using HPLC. *Aphidius* feeding patterns were then linked to estimated parasitism rates.

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