

Section V.
Pests of Wine Grape & Small Fruit Pests

SUGAR DIET EFFECTS ON PARASITOID BEHAVIOR AND PHYSIOLOGY

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The parasitic wasp, *Apanteles aristoteliae* Viereck (Hymenoptera: Braconidae), has been identified as the dominant parasitoid of the orange tortrix, *Argyrotaenia franciscana* (Walsingham) (Lepidoptera: Tortricidae) in small fruit cropping systems. Biological control potential of parasitic wasps in the field is expected to increase when sugar or nectar sources are provided by increasing longevity and replenishing carbohydrate reserves. The objective of this study was to quantify the effects of sugar feeding on *A. aristoteliae* physiology, olfactory orientation, and parasitism behavior.

Female wasps were sugar starved for 20 hours and then were fed a diet of water, 10% sucrose solution, or 25% sucrose solution. Levels of glycogen, fructose, and total sugars were highest among females fed 25% sugar solution and lowest for those fed water. In an olfactometer, wasps which had fed on sugar were more likely to choose host cues, while wasps which fed on water were more likely to choose food cues (Figure 1). In the short term, diet treatment did not affect the number of eggs laid, number of larvae parasitized, or number of larvae superparasitized. However, wasps which oriented towards host cues trended towards higher levels of parasitism activity (Table 1).

Figure 1. Wasp preference for food or host cues in an olfactometer. Stars denote significance.

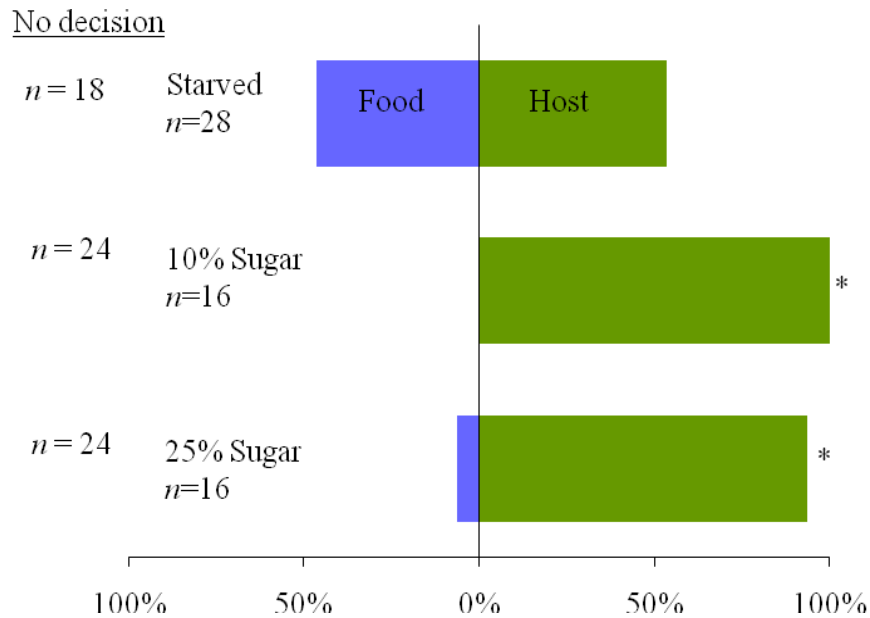


Table 1. Means \pm SE and ANOVA on the effect of treatment and olfactometer choice on parasitism behavior.

	# Eggs Laid	# Larvae Parasitized	# Larvae Superparasitized
Starved	4.65 \pm 0.83	3.81 \pm 0.65	0.70 \pm 0.22
10% Sucrose	6.55 \pm 0.91	5.0 \pm 0.65	1.28 \pm 0.26
25% Sucrose	6.10 \pm 0.88	4.88 \pm 0.69	1.12 \pm 0.22
d.f.	2, 120	2, 120	2, 120
<i>F</i>	1.33	0.99	1.71
<i>P</i>	0.269	0.372	0.185
No Choice	4.78 \pm 0.62	3.86 \pm 0.49	0.78 \pm 0.15
Host	7.2 \pm 0.88	5.57 \pm 0.63	1.41 \pm 0.25
Food	5.25 \pm 1.86	4.33 \pm 1.42	0.83 \pm 0.51
d.f.	2, 120	2, 120	2, 120
<i>F</i>	2.67	2.24	2.57
<i>P</i>	0.073	0.11	0.08