

Nectar Sugar Composition of Selected Avocado Cultivars and Related Species

X. Liu, G. Sherman, P. Robinson, G. Witney and M. L. Arpaia

Department of Botany and Plant Sciences University of California, Riverside

Based on the observations on nectar composition of various avocado cultivars reported by Gad Ish-Am (see previous article by R. Hofshi) we decided to examine nectar composition of selected avocado cultivars and *Persea schiedeana* in California.

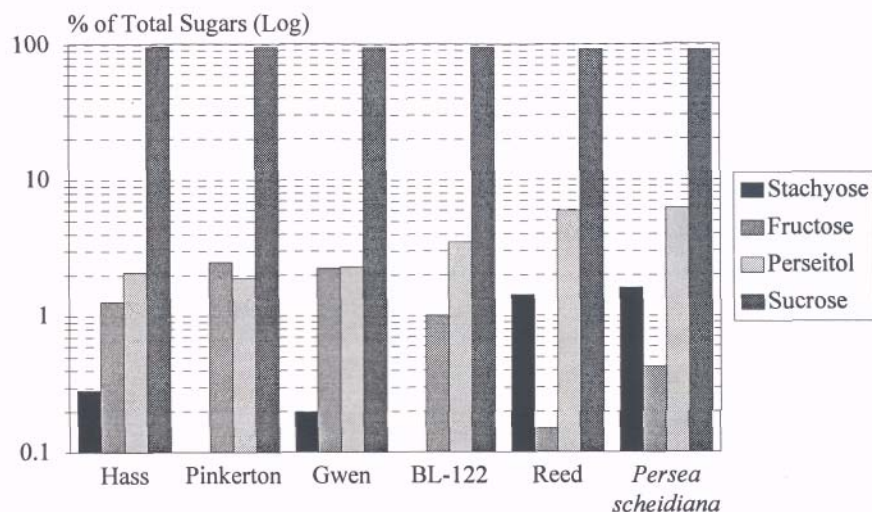


Figure 1. Relative composition of nectar collected from five avocado (*Persea americana* Mill.) cultivars and *Persea schiedeana*. Note that the scale used is logarithmic to provide accurate differences in the 0 – 10% range.

Nectar was collected in late April and early May 1995 directly from the flower nectaries of field grown trees either at the UC Experiment Station in Riverside or the UC South Coast Research and Extension Center in Irvine. Nectar was collected in late morning to early afternoon from female stage flowers. The nectar was analyzed using high performance liquid chromatography. Four sugar components were found in all samples; sucrose, fructose, stachyose and the sugar alcohol, perseitol. Figure 1 illustrates the relative concentrations of these. In all samples sucrose accounted for greater than 90% of the carbohydrates found in the nectar. Our data for the variety 'Reed' does not agree with the data presented by Ish-Am. He reported during his California visit that nectar from this variety had between 70-80% sucrose. Nectar collected from 'Reed' grown in California, however, contained approximately 93% sucrose.

In terms of relative composition, the nectar composition of 'Reed' was more similar to

Persea schiedeana than the other cultivars examined. Unlike the other cultivars examined the 'Reed' variety had lower levels of detectable fructose, a hexose sugar that Ish-Am indicated was preferred by honeybees. On the other hand, 'Reed' and *Persea schiedeana* had the highest levels of stachyose and perseitol.

What does all this mean? The difference in data between California and Israel for the 'Reed' variety would suggest that perhaps environment plays a role in nectar composition. We believe, however, that nectar composition is probably dictated by genetics rather than environment. The presence of perseitol in the nectar is of great interest. We have been following the occurrence of this sugar alcohol in other parts of the avocado tree for the past year. The sugar is found in relatively high concentrations in all parts of the avocado tree (roots, trunk, shoots, leaves and fruits). The role of the sugar alcohols in plant metabolism is not well understood and only recently has there been interest in elucidating the role of these sugars. We believe that perseitol and other related sugar alcohols may play in the alternate bearing habits of the avocado. Trying to understand the possible role that this plays in nectar composition is surely another piece of the puzzle of fruit set and productivity in the avocado.