

Metabolite presence and abundance in blueberry cultivars

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Introduction

Metabolites were extracted and annotated from pollen of *Vaccinium corymbosum* (highbush blueberry) grown at the experimental station of Washington State University. Four cultivars (Calypso, Draper, Liberty, and Last Call) were utilized in this experiment. Identifying and quantifying the metabolites present in the pollen allows for greater accuracy in determining helpful changes that will further develop the symbiotic relationship present between honeybees and blueberry plants.

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Methods:

Metabolites were extracted from 57 pollen samples collected from flowers of the four cultivars interests. Metabolites were separated via Gas Chromatography Mass spectrometry (GC-MS) and manually annotated and quantified using the software Xcalibur via comparison with internal standards. The data were normalized and plotted as a heatmap.

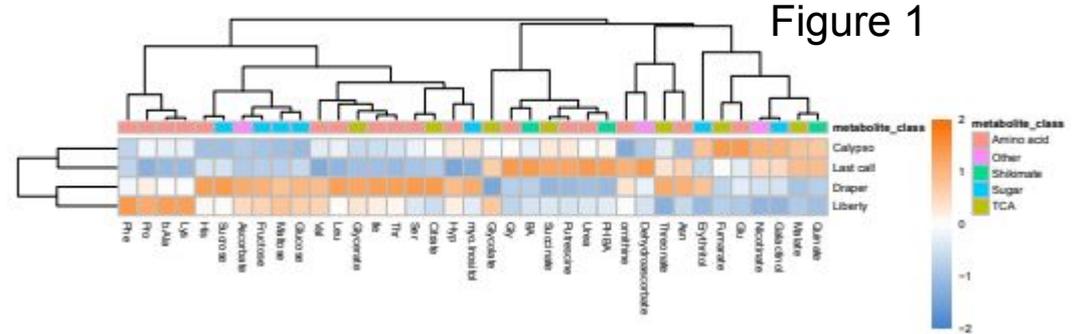


Figure 1

Results

The heatmap (Fig. 1) shows that the cultivars Calypso and last call cluster together and separately form Draper and Liberty. Calypso and Last call revealed high content of metabolites of the TCA cycle. In particular, fumarate is present at elevated concentration in the cultivar Calypso. Fumarate, is important to treat iron deficiencies, and in honeybees' diet is used for development, reproduction, and immune system support. Pollen from Draper and Liberty shows elevated concentrations of carbohydrates, in particular glucose, fructose, sucrose and maltose. Lys, which is an essential amino acid also very important for the diet of bee pollinators, is elevated Liberty.

Conclusion

Analysis of metabolites in blueberry pollen revealed great differences depending upon the cultivar, with Draper and Liberty and Calypso and Last Call forming two separate groups. Our results show that the cultivars of choice may have a great impact on the diet and finally the health of honey bee pollinators.