Analysis of the Volatile Compounds Produced by Microbial Communities Associated with Drosophila suzukii

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Drosophila suzukii is a type of fruit fly that caused severe economic damage to soft fruit crops in North America. It has a mutualistic relationship with the microbial communities in the berries that it attacks. With that in mind, we investigate the volatile compounds that are produced by the microbial communities of yeasts and bacteria to better understand the chemicals that attract D. suzukii. Differing from previous research, this project examines the effect of group metabolism in microorganisms. Using Gas Chromatography-Mass Spectrum, we sampled combinations of 1 species of bacteria and 4 species of yeasts. The total peak area of H. uvarum is 224811651.3 in the chromatograms of the 3 samples. The total peak area of G. cerinus is 5033327.7 in total, and the total peak area of H. uvarum cultured with G. cerinus is 153148625.7 in total. When only considering the samples from this set of data, qualitatively, the type of compounds produced by Hanseniaspora uvarum and when H. uvarum was cultured together with Gluconobacter cerinus barely differ. Quantitatively, the amount of chemicals that H. uvarum produced individually was 1.46793 times the amount when it was mix cultured with G. cerinus. Noting that this is a primitive finding, with the insights gained, instead of examining the net metabolite produced, further studies may look into the dynamic within the microbial communities to identify the characteristics of an effective bait for D. suzukii.

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