Additive microbe studies to elucidate semiochemicals responsible for attractive and/or repellent effects on *Drosophila suzukii*

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The spotted wing drosophila (*Drosophila suzukii* (Matsumura)) has been a major insect pest in the continental United States since its introduction into California in 2008. These flies are capable of significant damage to cherries, blueberries, and other soft skin fruits, and costs related to pest management and crop loss are estimated at $718 million dollars annually. Control strategies for the spotted wing drosophila (SWD) include broad spectrum chemical insecticides, but many of these control measures fail to manage SWD due to reduced residual activity, low efficacy on spotted wing drosophila, or dissipation by rainfall. Chemical communication among insects, plants, and microbes are highly complex and have a wide range of influences that can be positive, neutral, or detrimental to the any of these organisms. For insects, these influences include host plant or oviposition site selection. Knowledge regarding the effect microbes and microbe volatile emissions have on host and oviposition preference is limited; however, careful study of the chemical communication between SWD and microbes may be useful in predicting their impact on and spread to other crops. This information could also uncover possible microbial targets for biological control. Other researchers have shown that host preference of spotted wing drosophila is associated with the population of microbes that colonize fruit. Behavioral research in our labs has demonstrated SWD preference for previously-foraged fruits. Here, we evaluate the volatile production of several identified microbes isolated from SWD-foraged fruit. Microbe isolates were inoculated into a mixture of 10% organic fruit juice and liquid broth media, incubated at 32 °C, and the volatile headspace produced was collected then analyzed. We hypothesized that the suite of volatile chemicals produced by the microbes are unique to each microbe as well as their host and play a role in host preference behavior displayed by the SWD flies. Discussed will be results from the headspace analyses of several of these microbes in various media/hosts, and their application toward control of SWD.