

Abstract

# Tephritids Gut Microbionts: Diversity, Volatile Emissions and Their Impact on Fly Behaviour †

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**Abstract:** The interaction between insects and their gut microorganisms is an interesting and promising field of ecological and entomological research. The importance of microbionts on the life history traits of fruit flies has been well-studied in several tephritid species belonging to the genera *Anastrepha*, *Bactrocera*, *Ceratitis*, and *Rhagoletis*. However, the production of microbial volatile organic compounds (mVOCs) and their role in tephritid fruit fly-microorganism interactions has been overlooked. As the symbiosis of tephritids with their associated gut bacteria shows promising pathway for biocontrol, the potential use of mVOCs for Tephritidae fruit fly pest control management is of particular interest. Here, we review the information known regarding the composition and diversity of the microbial community in tephritid fruit fly guts and their effect on behaviour, especially attraction. We also analyse the available information on mVOCs that are responsible for the tephritid fruit fly attraction towards their associated gut microbionts. The overview of fruit fly-microbe chemical relationships contributes to identify knowledge gaps and provides potential scope for further research to develop new semiochemicals for fruit fly pest management.

**Keywords:** microbiont; bacteria; Yeast; Microbial Volatile Organic Compounds; Tephritidae; Attraction; Insect-Microbe Interaction