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Volatile organic compound (VOC) profiles as an indicator of citrus leaf maturity

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Citrus species are considered the most widely grown fruit crop worldwide. Volatile organic compounds (VOCs), which are hydrocarbons with high vapor pressures such as D-limonene and other terpenes, readily enter the air at room temperature. *Citrus* VOCs have been extensively studied in relation to citrus peel oils which are commonly used as flavors and fragrances. *Citrus* volatiles mainly consist of alcohols, aldehydes, monoterpenes, oxygenated monoterpenes, sesquiterpenes and esters. Leaf volatiles function as plant signaling phytohormones, attractants for insect pollinators and many are released in response to biostresses (such as herbivory or pathogen attack). The roles of specific released volatiles in response to leaf maturation are not well understood. In this study we detected changes in profiles of VOCs from young, intermediate and mature leaf clusters collected from *Citrus macrophylla* by *in vivo* headspace-SPME- GC-MS. Using an apparatus that isolates intact leaf clusters, we collected the released volatiles from living *Citrus* plants without interference from those released when plants are sampled in a destructive manner. We detected more than 40 biogenic volatile compounds released from maturing citrus leaves. VOCs which increased with maturity included *z*-citral, citronellal, geranyl acetate and *z*-farnesol. Compounds which decreased with maturity included α -pinene, Δ -carene, β -ocimene and one unknown volatile. Determining the volatile profiles of citrus varieties at different stages of development will help elucidate the roles of specific volatiles in leaf maturation and developmental physiology without interference of those released as a response to biostress.

Biography

Shelley E Jones has earned her BS in Biology in 1989 from Old Dominion University in Norfolk, USA. She has worked at the UF Citrus Research and Education Center for almost 15 years, gaining experience in many areas of research including post-harvest quality, *Citrus* flavors and byproduct chemistry, food technology and engineering and most recently in the vector-pathogen-host interactions lab of Dr. Nabil Killiny. In addition to leaf volatile analysis, she specializes in metabolomics and using GC-MS for analysis of complex biological samples including plant phloem sap, insect hemolymph and honeydew.

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