11.3 Wounding of Guava (Psidium guajava L.) Leaves Produces Defensive Sulfur Volatiles

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Volatile from mechanically wounded and intact guava leaves (Psidium guajava L.) were collected using static headspace solid phase micro extraction, SPME, and determined using GC-pulsed flame photometric detection, PFPD, and GC-MS. Leaf volatiles from four common citrus cultivars were also examined similarly to determine the differences which might be responsible for guava’s protective effect against the Asian citrus psyllid (Diaphorina citri Kuwayama) which is the insect vector of Huanglongbing (HLB) or greening disease. Seven sulfur volatiles were detected: hydrogen sulfide, sulfur dioxide, methanethiol, dimethyl sulfide, DMS, dimethyl disulfide, DMDS, methional and dimethyl trisulfide, DMTS. Identifications were achieved by matching linear retention index values on ZB-5, DB-wax and PLOT columns and MS spectra in the case of DMDS and DMS. DMDS is an insect toxic, defense volatile produced only by wounded guava and not citrus leaves. Thus, DMDS may be one of the components responsible for the protective effect of guava against the HLB vector. DMDS is formed immediately after wounding, becoming the major headspace volatile within 10 min. Forty-seven additional leaf volatiles were identified from linear retention index, LRI, and MS data in wounded guava leaf headspace.