

## Investigating Potential Pest Management Strategies for Citrus Gall Wasp in Australia

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**Abstract :** Citrus gall wasp (CGW), *Bruchophagus fellis* (Hym: Eurytomidae), is an Australian native insect pest. CGW has now become a problem of national concern, threatening the viability of the entire Australian citrus industry. However, CGW appears to exhibit a preference for certain citrus species; growers report that grapefruit and lemons are most severely infested, with oranges and mandarins affected to a lesser extent. Given the specificity of the host plant-insect interactions, it is speculated that plant volatiles may play a significant role in host recognition. To address whether plant volatiles is involved in host plant preference by CGW we tested the behavioral response of CGW to plants in a wind tunnel. The result showed that CGW had significantly higher preference to grapefruit and lemon than other cultivars and the least preference was recorded to mandarin (Chi-square test,  $P < 0.001$ ). Because CGW exhibited a detectable choice further studies were undertaken to identify the components of the volatiles from each species. We trapped the volatile chemicals emitted by a 30 cm tip of each plant onto a solid Porapak matrix. Eluted extracts were then analysed by Gas Chromatography-Mass Spectrometry (GCMS) and the presumptive identity of the major compounds from each species inferred from the MS library. Although the same major compounds existed in all of the cultivars, the relative ratios of them differed between species. Next, we will validate the identity of the key volatiles using authentic standards and establish their ability to elicit olfactory responses in CGW in wind tunnel and field experiments. Identification of semiochemicals involved in host location by CGW is of interest not only from an ecological perspective but also for the development of novel pest control strategies.

**Keywords :** Citrus gall wasp, *Bruchophagus fellis*, volatiles, semiochemicals, IPM

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