



Wolfson Department of Chemical Engineering Special Seminar

Lecture Hall 6, Wolfson Department of Chemical Engineering,

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Odor pattern of RPWs infected palm trees

Red Palm Weevil (RPW) scientifically known as *Rynchophorus Ferrugineus* led to death of millions of palm trees all over the world makes it the most destructive insect for palm trees. Detection of infested tree is very difficult because there are almost no visual signs outside the tree until the point where the tree is severely damaged and cannot be cured. Therefore, there is an urgent need for a reliable early detection technique.

This work makes the assumption that RPW infected trees, will have distinct volatile organic compounds (VOC) pattern which differentiate them from non-infested trees. In order to expose this VOC unique pattern an experiment was conducted with the collaboration of Eden research center, the experiment includes two groups of 10 trees each, one group was infested with adult RPWs, while the other group served as a control group. Once a week an air samples were collected from the near surrounding of every tree using reusable Tenax tubes, then the samples were analyzed using GCMS. Unfortunately, by the end of the experiment the trees were not infested successfully.

A long side with the control experiment, interior of newly collapsed tree in the field was collected, the sample included tree tissues and RPWs in all growing stages. Samples were taken using reusable Tenax tubes, GCMS analysis showed keen results, a list of VOCs were detected with high similarity match, for example: D-limonene, Toluene, Ethyl Acetate, Hexane, Heptane, Nonanal, Alpha-pinene, Hexadecane, Acetophenone and Carbon disulfide. These VOCs has an odor mixture of sweet, fruity, pungent up to rotting eggs smell like. Some volatiles came from yellowish liquid. These odor mixture fits perfectly field professionals' testimonies. A closer look, find direct and indirect link between these VOCs to RPWs, some as repellent for RPWs as part of the tree's defense mechanism, other serve as attract compounds for RPWs. Together they offer potential VOCs pattern for RPWs detection.

Refreshments served at 13:15