STUDIES ON AGGREGATION PHEROMONE AND HOST ATTRACTANTS OF THE BANANA STEM BORER *Odoiporus longicollis* (COLEOPTERA; CURCULIONIDAE)

by

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ABSTRACT

Aggregation pheromones and host attractants for the banana stem borer, *Odoiporus longicollis* (Coleoptera: Curculionnidae) were investigated as possible lures for the control of the above pest. Gas liquid chromatography-electroantennographic detection (GC-EAD) of male volatiles of *O. longicollis* indicated the presence of an active peak at a GC retention time of 9.405 min. Gas liquid chromatography-mass spectrometry (GC-MS) of the active peak in male volatiles identified 2-methyl-4-heptanol as the aggregation pheromone and this was synthesized in 84 % yield by a coupling reaction between butanal and 2-methylpropyl magnesium bromide. The synthetic product was active to male and female *O. longicollis* in the electroantennogram (EAG) eliciting maximum responses at 0.78 and 0.92 mV respectively. In a laboratory behavioural bioassay using an olfactometer the synthetic product attracted a maximum of 70 % of weevils at a dose of 50 µl.

The steam distillates of the pseudostems of different banana (Family: Musaceae) varieties were evaluated for activity with *O. longicollis*. Seeni kesel steam volatiles were highly EAG and behaviourally active (1.41 mV and attracting 70 % weevils respectively). Of the steam distillates of the pseudostem of banana varieties those of Seeni kesel, Anamalu and Kolikuttu showed higher activities attracting 70, 60 and 59% weevils respectively. That of Ambul Kesel attracted only 36% of the weevils. GC-EAD followed by GC-MS analysis of

Seeni kesel steam distillate revealed that hexanol, hexanal, pentanol and Z-3-hexenol were host attractants.

The synthetic equivalents of the above host attractants were EAG assayed individually. Hexanol elicited the highest EAG response (0.39 mV) compared with pentanol (0.15 mV), hexanal (0.10 mV), and cis-3-hexenol (0.09 mV). A mixture of the above synthetic attractants mimicking the steam distillate elicited poor responses in *O. longicollis* (EAG-0.2 mV) whilst that of the steam distillate itself was high (0.62 mV).

Using the above attractants as lure, incorporated in a water bucket trap, a field assay was carried out. The synthesized pheromone, banana stem tissue and the synthetic host attractant mixtures were individually not effective as field attractants. Of the different combinations of the above attractants assayed only that of the synthesized pheromone and host tissue showed high activity in the field. This combination trapped a mean of 30 weevils/week/trap at a pheromone release rate of 0.4 mg/day.