

**The Efficacy of Odour-Baited Bottom Board Trap for Controlling Small Hive  
Beetle, *Aethina tumida* (Coleoptera: Nitidulidae) In Honeybee Colonies**

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## ABSTRACT

Honeybees are of great value in Africa for both their economic and ecological importance. Economically, they are important pollinators of a great host of commercial crops as well as a source of food and livelihoods for thousands of small-scale beekeepers. Ecologically, they contribute to floral biodiversity and conservation through their pollination activity of both cultivated and wild plants. In Kenya, bee keeping as an income generating activity is being utilized as a tool to fight poverty in the rural arid and semi-arid areas. In the past, problems posed by honeybee pests were considered insignificant in Africa. More recently, however, an increasing number of exotic diseases like varroasis and pests *Varroa* mites as well as indigenous pests like wax moth and small hive beetles threaten honeybees, bee keeping and honeybee pollination in Africa. *Aethina tumida* Murray is considered a minor parasitic pest of African honeybee colonies within its native host range, and a serious exotic pest to European honeybees feeding on the honey, pollen and bee brood eventually causing honeybees to abscond the hives. The effectiveness of odour-baited bottom board trap for *A. tumida* was tested in a field apiary where eight traps were deployed in 24 honeybee colonies over a 32-week trapping period and the trap catches relative to the total population of *A. tumida* in the hives recorded. The bait consisted of commercial pollen dough conditioned by inoculation with yeast, *Kodamaea ohmeri* (NRRL Y-30722). The trap captured on average over 50% of the beetle population in the honeybee hives per trapping period although this varied between dry and rainy seasons with significantly more beetles captured in the wet season. The trap nearly eliminated the beetles from the hives under trapping for a period of seven months. Laboratory bioassays using a dual choice olfactometer showed that *A. tumida* was significantly attracted to both worker honeybee and yeast-inoculated commercial pollen dough volatiles as compared to the controls, air and uninoculated pollen

dough respectively while yeast-inoculated pollen dough volatiles attracted significantly more beetles compared to worker honeybee volatiles. The analysis of volatiles from worker honeybees and yeast-inoculated pollen dough showed that both odour sources contained some similar compounds with few fermentation related compounds being found in inoculated pollen dough only. This study showed that odour-baited bottom board trap is efficient not only as a monitoring tool but also as a management tool for *A. tumida* infestations in honeybee hives.