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Research Communication

A simple technique to capture, contain and monitor the fresh-emerging beetles of tree borers

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Wood-boring insects are among the most destructive pests of forest, plantation and fruit trees. They belong mainly to the Order Coleoptera and important groups of tree borers include metallic wood boring beetles (Buprestidae), longhorned beetles (Cerambycidae), and bark and ambrosia beetles (Scolytidae) (Beeson, 1941). The larvae of insect borers remain cryptic inside the stem or trunk and feed predominately on subcortical tissues, which consist primarily of the inner bark, phloem, and immature xylem (Potter and Potter, 2008). They make extensive galleries or tunnels that run throughout the vascular tissue of the host trees. The damage results in girdling, die back, structural weakness, decline and eventual death of trees (Shivananda *et al.*, 2012). The grub is the damaging stage and has a prolonged period ranging from 6-8 months. After pupation inside the trunk, adults emerge and fly out by making characteristic exit holes. Flight period of adult beetles takes place any time between June and August (Palaniswamy *et al.*, 1977).

In the field, only symptoms are found and adults are rarely seen. In order to study the species diversity and bioecology of borers, it is essential to capture the adults. The information on the nature of species, the precise timing and the number of adult beetles emerging from particular portion of tree trunk or branch, helps to devise the management schedules. Since, it is difficult to predict the exact timing of beetle emergence, capturing beetles remains an elusive task. Use of light traps is an option to attract and capture adult beetles. But the limitation is that several non-target species are also attracted and hence it would be difficult to identify the specific host of a particular species as they are not species specific.

Here a simple, cost effective and an easy to adopt technique to capture the adults of stem or trunk boring insects is described. This has been successfully used at Indian Institute of Horticultural Research, Bengaluru, India (12.97^{o}N and 77.56^{o}E) to capture the adult beetles of Cerambycidae and Buprestidae emerging from trunk and branches of mango trees during June – September 2014. To start with, the borer affected trunks or branches have to be identified by the presence of the droppings of fecal matter or the chewed wood material. After locating the target trees, the stem portion containing the active holes was wrapped with a white transparent nylon mesh 40 in the month of June. The ends of the mesh were tied with a gunny thread, so that the trapped beetles do not escape (Fig.1). Care was taken to have enough space for free movement of the

beetles. The mesh traps were observed every day for the presence of beetles. From the second week of June, the beetles started emerging out and getting trapped in the mesh (Fig.2). They were collected and brought to the laboratory for further observations.

The trunk borer, *Batocera rufomaculata* De Geer (Coleoptera: Cerambycidae) was the first to emerge and the maximum emergence (4/10 trees) was recorded during second week of July. The next species to emerge was *Glenea multiguttata* Guerin-Meneville (Coleoptera: Cerambycidae) in the fourth week of June followed by a buprestid and *Coptops* sp. (Coleoptera: Cerambycidae). Of these, *G. multiguttata* was numerically the most dominant species (mean 9.0/tree) with peak period of emergence being the first fortnight of September (Table 1). *Batocera rufomaculata* has emerged out from trunk of the mango tree while the other three species had emerged out of lateral branches. This technique has helped in understanding certain issues of borer infestation. It was generally assumed that *B. rufomaculata* was the only species infesting mango trees under Bangalore conditions. However, in the present study using the mesh trap techniques, besides *B. rufomaculata*, three other species as mentioned above were collected (Fig.3). This indicates the occurrence of more than one species in the borer complex. There was a clear niche demarcation between the species with *B. rufomaculata* mainly confining to trunk while other three species infesting lateral branches.

Since there are no effective protocols for laboratory rearing of Cerambycids, this technique facilitates capturing virgin beetles of both sexes which can be used for any behavioral studies. During September 2014, following a heavy shower, there was a surge in the emergence of *G. multiguttata* with swarms resting on avenue trees, especially jackfruit, bordering mango orchard. As these beetles were captured and identified earlier, it was easy to infer that they emerged from mango field and decide upon control measures to check fresh infestation. But for this information, there was a possibility to overlook them as species of nonsignificance. Covering stems with mesh also helps as a barrier to protect the stems from oviposition by mated female beetles.

CONCLUSION

To conclude, stem or trunk wrapping with wire mesh is an easy to adopt technique useful to monitor the timing of borer emergence as well as to collect and destroy the beetles so that subsequent infestation could be effectively curtailed and has scope for use in fruit crops like mango, grapes, guava, jackfruit, etc.

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Fig.1: Mango tree trunk and borer affected branches wrapped with wire mesh

Fig. 2: Fresh emerged *Glenea multiguttata* trapped in mesh wrap

Batocera rufomaculata

unidentified Buprestid

Coptops sp.
An

Glenea multiguttata