

Novel device for field release of parasitoids



Novel device for the field release of parasitoids against black headed caterpillar on coconut palms

Technology Description

Black-headed caterpillar, *Opisina arenosella* Walker (Lepidoptera: Cryptophasidae) is a major pest of coconut palm. The pest is of most common in coconut growing areas of Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu, and West Bengal, occurs throughout the year in coastal and backwater tracts. *Goniozus nephantidis* (Hymenoptera: Bethyridae) is the dominant parasitoid on *O. arenosella*. However the adult *G. nephantidis* can be easily produced on *Coryca cephalonica* larvae, the effective field release is most important. To either establish parasitoids in new locations, or augment established populations, classical and augmentative biological control programmes typically culture parasitoids in the laboratory, then release them in the field either by releasing the adults of *G. nephantidis* on the crown of the coconut trees or releasing the adults on the trunk of each tree (Venkatesan *et al.*, 2003). However, it is labour intensive methods i.e. at least it will take 2 to 3 minutes to release parasitoids/tree and would take 6 hrs to 9.5 hrs to complete one ha area/person. Hence, the newly invented parasitoid release device makes the release of the parasitoids quicker, easier and in more economic aspects too.

Background

Opisina arenosella is an upsurge pest and it assumes severe proportions on the coastal and backwater tracts, also occasionally observed in the interior areas near river and paddy fields. On the west coast of India, the pest occurs throughout the year with high population from February to May. Among different natural enemies attacking the black headed caterpillar, *G. nephantidis* is the dominant parasitoid and is responsible for the reduction of *O. arenosella*, which is being widely used in the biological control programme against the coconut leaf-eating caterpillar. However, there are no suitable methods available for the field release of parasitoids against *O. arenosella*. Keeping the above in view, a novel device was developed for the field release of the parasitoids against *O. arenosella*.

Benefits /Utility

It was practically impossible to release the parasitoids in large areas, such as coconut plantations, which sometimes cover up to thousands of hectares. Manual release will

take 6.0 to 9.5 hours/hectare (2-3 min/palm) also warrants huge manpower. The novel and simple device will reduce the time and cost towards the manpower. Therefore, release of parasitoids in thousands of hectares can be covered in a short time and the precision of the release of parasitoids could be easily matched with the target pest stage (3rd to 7th instar larvae).

This technique can avoid stinging from the parasitoids as the mature cocoons (soon to emerge) are kept inside the device. The newly emerged adults will come out of the device through the insect emergence holes and climb up the trunk to the crown of the coconut palm. So, this device avoids the need for the farmer to handle the adult parasitoids which sting badly during release.

The device is semi-permanent and easy to fix on the trunk of the tree. During off season, the device can be removed and stored.

Scalability

For coverage of 100 ha of plantations, Rs.2.5-3.0 lakh is required. The investment on rearing facility is a one time investment can be utilized for more than a decade and the device manufacturing cost may range from Rs.10-15/piece also it can be reused. The parasitoid can be easily mass produced on *C. cephalonica* larvae which yields 8-12 parasitoids/larva and the cocoons (2 days old) could be stored for 10 days at 15 °C. Fecundity of the parasitoid is 60-70/female. All the materials are locally available and cost effective (Rs. 15/piece) and costs Rs. 2655/ha. The basic infrastructure facility with incubator and other operational expenditures is applicable.

Business and commercial potential

The technology leads to generation of employment and easy to manufacture even by women farmers/ NGOs/ unemployed youths/self-help groups.

Financials

The economic design of a device enables a single device can be produced using locally available materials and a single device can be produced at the cost Rs.15 approximately.

Target Market/Customer

Coconut farms and large plantations

Social Impact of the Technology

The technology could be very useful for farmers especially women and could reduce the pesticide usage on the coconut gardens and conserve the parasitoids. The technology would be helpful to generate employment for the farmers, unemployed youths and women farmers.