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Mass Rearing and Importance of Rice Moth

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SUMMARY

Rice moth is an economically important stored grain pests in Asia, Africa, North America and Europe. It is a major pest of rice but also feed on wheat, maize, sorghum, cotton seeds, groundnut, coffee, cocoa beans, and millet. Besides being a pest, it is factitious host for 75 natural enemies of which 60 are parasitoids and 15 are predators including a few that are host specific in nature. It also serves as a host for nematodes and mites. Global warming has cautioned we and the adverse consequences of insecticide use are always alarming and also inducing pest out-break because of pest resistance. These entomological backlashes have compelled the scientists to be concerned with entomologically compatible pest management programme.

INTRODUCTION

Now days, Integrated Pest Management (IPM) is well known to all of us where all the suitable pest control techniques are being used to find ecologically sound and environmentally safe ways of pest control. Biological control should be regarded as the backbone of any IPM programme and about 90% of all potential pests are already under biological control. The biological control is one of the most effective means of achieving insect control. For achieving successful biological control, there is the requirement of suitable laboratory host. The rice moth can be easily reared and mass multiplied by using the diets. Because of the various advantageous nature, these are used as suitable host. The wide acceptability of rice moth is unique and is turned out a boon for mass production of different biocontrol agents. The success of biological control, more particularly by in-undative releases of natural enemies, largely depends on our ability to mass-produce the required biological control agents for timely releases. Mass-production of parasitoids and predators calls for an elaborate arrangement to culture the host insects in the laboratory. In cases where the original host of the concerned biological control agent is either not amenable to mass-production or its production is rather tedious and costly, a suitable alternative host will have to be employed. The rice moth, *Corcyra cephalonica* Stainton (Lepidoptera, Pyralidae), has gained tremendous importance in this respect. *Corcyra cephalonica* commonly called as rice meal moth or rice moth. Many of the natural enemies mass-bred in the laboratory for use in field against crop pests are dependent on either egg or larval stages of Corcyra due to the simple reason that it is easier and cheaper to produce natural enemies on different stages of Corcyra than on their original hosts.

Advantageous features for the use of rice moth as a laboratory host

- Easy to mass-produce under normal conditions of temperature and humidity.
- Facilities required are simple.
- Acceptable as a perfect factitious host to a variety of parasitoids and predators.
- Its food media are dry, readily available, and can be easily stored.
- Production is economical.
- Larvae are not cannibalistic, so suitable for mass-rearing.
- Eggs, loosely laid, are very convenient to collect and handle.
- Eggs, larvae and pupae are sufficiently large and nutritious enough for the normal development of various parasitoids and predators.
- Serious incidence of diseases in the mass-culture is rare.

Schemes of mass rearing of rice moth

1. Sterilize the wooden boxes in hot air oven at 100 degree Centigrade for 1-2 hours

2. Pour sterilized crushed Maize/Sorghum/Rice of 2.5 kg per box

3. Add 50 grams of broken ground nut, 5 grams of yeast, 1 gram of wettable sulphur, 0.05 gms of streptomycin sulphate in each box
4. Sprinkle 1 cubic centimetre of Corcyra eggs per box on the top of culture medium and mix up the medium thoroughly
5. Cover the box with lid and label the date of inoculation
6. Favourable temperature for rearing is 28±2 degree centigrade and Relative humidity, 75% +/- 5%
7. The moth starts emerging within 45-50 days, collect the moths inside the net by glass tubes and transfer the moths to egg laying chamber
8. Provide cotton soaked 20% honey+ vitamin E solution as adult food in the egg laying chamber.
9. Collect the eggs daily

Production of trichocard from the eggs of rice moth

1. The parasitisation of *Trichogramma* spp., in laboratory condition on one cc eggs of Corcyra cephalonica, which are uniformly spread and pasted on a card measuring 15 cm x 10 cm is called as Tricho card. The card has 12 demarcations (stamps).
2. Apply gum on the card and sprinkle the cleaned eggs uniformly in a single layer with the aid of a tea strainer.
3. The excess eggs pasted are removed by gently passing a shoe brush over the card after sufficient air drying under fan.
4. Treat the eggs under UV lamp for 30 minutes to kill the embryo (at present price of UV light in market is Rs. 1,121)
5. Take polythene bag, insert UV treated “Trichocard” and nucleus card at the ratioof 6:1 (6 Corcyra egg cards: 1 Trichogramma nucleus card) and provide 50% honey with vitamin E in a soaked cotton swab.
6. Remove the Tricho cards after 24 hours. On fourth day, the Corcyra eggs changes to black in colour and indicates the parasitization of eggs.
7. Release the tricho cards in the fields when at least 5 % adult emergence (pharate stage) is observed. During each release trichocards should be cut into 12 or 16 bits and staple to the lower side of leaf of plant during morning or evening hours.
8. At fourth or fifth day tricho cards can be stored in refrigerator/fridge at 10 degree centigrade up to 21 days. (if we will not store Trichocard in refrigerator then we should immediately release Trichocard in field.)

Uses of rice moth

- The eggs, larvae and pupae of Rice moth have been found to serve as perfect factitious hosts for mass production of about 75 species of parasitoids and predators
- Corcyra eggs are used for the mass rearing of parasitoids such as,*Trichogramma sp., Chelonus blackburnii* and predators such as *Chrysoperla carnea, Cyrtorhinus lividipennis*.
- Corcyra eggs are used in the preparation of trichocards.
- Corcyra larvae are used for the mass rearing of parasitoids such as, *Eriborus trochanteratus, Bracon hebetor, B. brevicornis, B. kirkpatricki, Goniozus nephantidis, Stenobracon nicevillei, Apanteles sp., Rhinocoris marginatus*.

CONCLUSION

The value of biological control in pest management has been well established. Inspite of it, the method has not found as much practical application as it deserves to be. One of the main reasons for this is the difficulty in mass-producing the natural enemies at economical cost and making these available in adequate quantities for timely releases. More often, the success of mass-production of natural enemies is dependent on the successful production of its original or factitious host. In this respect, the value of Corcyra, which serves as a laboratory host for a wide range of natural enemies, is unmatched. For example, but for Corcyra, *Trichogramma sp.* would not have found such wide application in biological control in India as also in several other countries. Although *C. cephalonica* is an old insect and has been studied and multiplied since several decades, there has not been any significant breakthrough in its mass production technology. In fact, while there are numerous publications on other aspects of Corcyra, those dealing with its production technique are hardly a few. Perhaps, those engaged in its production seem to have learnt to live with certain regular problems associated with its production such as moth collection, scale contamination, cross infestation, *B. hebator*, etc. However, in view of the increasing importance being given to biological control in integrated pest management there would be high increase in demand for natural enemies. Therefore, a versatile laboratory host like Corcyra should be fully exploited. A well planned mass production technique is a pre-requisite to achieve this.

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