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MASS PRODUCTION OF RICE MOTH (*Corcyra cephalonica*)

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Introduction

Corcyra cephalonica, also known as the rice moth, is a pest of stored grains including oilseeds, pulses, dried fruits, nuts, spices, cereals and cereal products. Many of the natural enemies that are mass-multiplied in the lab and used in the field to combat crop pests rely on *Corcyra* eggs or larvae. Producing natural enemies on various stages of *Corcyra* is less complicated and expensive than doing it on their original hosts. The rice moth (*Corcyra cephalonica*) produces eggs that are utilized to multiply *Trichogramma* species, *Chrysoperla carnea*, *Bracon brevicornis*, *Bracon hebactor*, *Chelonus blackburni* and others in large quantities.

Morphology of rice moth

The oval-shaped eggs have dimensions of roughly 0.5 x 0.3 mm. At one end of the sculptured white surface is a small process that resembles a nipple. With the exception of the prothoracic tergite and head capsule, which are brown, the larvae are typically creamy-white. The prolegs on abdominal segments 3-6 and 10 are well-developed. A fully developed larva is 15 mm in length. The final instar larva spins a double-layered, intricately constructed cocoon in which it matures into a dark-brown pupa. The adult emerges via a line of weakness in the front part of the cocoon. The adults are little. The forewings are mid-brown or greyish-brown with faint, hazy darker brown lines running down the veins, while the hindwings are pale-buff. Compared to females, males are smaller. Typically, sexual activity starts soon after adult emergence. The pre-oviposition phase lasts for roughly two days. The majority of egg-laying takes place at night. While oviposition may continue throughout life, the largest numbers are laid on the second and third days after emergence.

Biology (life cycle) of rice moth

It takes two to three days for eggs to hatch. The ideal temperature range for *Corcyra cephalonica* larval development is between 30 ºC and 32.50 ºC and 70% relative humidity. At these conditions, the time from egg to adult emergence is only 26–27 days. Although the number of larval instars varies greatly, males typically have seven, while females have eight. Within the food, the last-instar larvae pupate. Through a line of weakness at the front end of the cocoon, the adults emerge. There is a 1:1 sexual ratio. Being nocturnal, the adult moth is most active at night.

Materials required

Broken cumbu grains, plastic basins (30 cm diameter), khada cloth, yeast tablets, rubber bands and twines, moth's scale egg separator, fried groundnut powder, sulfur- wettable powder, streptomycin sulfate (0.05%), G.I. mating drum (25 x 25 cm), formaldehyde 40%, hand sprayer and hand atomizer, honey, camel hair brush, vitamin – E capsule, shoe brush, moth collector or specimen tubes, absorbent cotton, oven, face mask and weighing balance.

Steps (Procedure)

1. Preparation of rearing basins

After washing with 0.5% detergent and rinsing in tap water, the basins (30 cm in diameter) used for *Corcyra* multiplication are thoroughly cleaned with a dry, clean cloth and allowed to dry in the shade. After a rearing cycle, the trays must always be emptied, cleaned (ideally with 2% formaldehyde) and put back in storage until needed again. The cleaning procedures must be repeated after reuse.

2. Preparation of medium

A milling machine breaks the 2.5 kg of bajra grains into two to three pieces after coarsely milling them. To get rid of the remaining population of stored product insects, such as *Rhizopertha dominica*, *Sitotroga cerealella*, *Tribolium castaneum*, and fungal pollutants, the broken grains are heat sterilized for one hour at 100 degree Celsius. After being sterilized, the grains are chilled in a hygienic setting using a fan. After that, the grains are moved to plastic basins weighing 2.5 kg each and 100 g of fried groundnut kernels are added to each basin and everything is carefully combined by hand. Wetable sulfur and dry yeast (Bakers) are added at a rate of 5 g per basin, and everything is well combined. 10 milliliters of 0.01–0.05% streptomycin sulfate should be sprayed over and the ingredients should be well mixed. The larvae of *Corcyra* are raised on this medium. The medium is created in accordance with the quantity of basins needed for egg infection.

3. Preparation of *Corcyra* eggs

Reputable labs and commercial producers are the main source of *Corcyra* eggs for bulk preparation. The adult moths can be gathered from warehouses that hold the food supplies if the goal is to start the production process with a nucleus colony. The eggs utilized to establish the *Corcyra* colony must be devoid of impurities such as moth scales and shielded from ultraviolet radiation. It is estimated that a cc of eggs contains between 16,000 and 18,000 eggs.

4. Inoculation of *Corcyra* eggs

The first time that desired numbers of *Corcyra* eggs were introduced into cumbu medium. To do this, the freely flowing eggs are sprinkled on the medium's surface in separate basins. There are 0.5 cc of *Corcyra* eggs contaminating every basin. After that, the basins are secured with rubber bands and covered with fresh khada fabric. The basins are moved to the racks with care.

5. Handling the trays during larval development

Within three to four days of hatching, the larvae start feeding on the reinforced Bajra medium. Light webbings are seen on the surface at this point. The larvae descend as they mature. The larvae are left to grow in the trays undisturbed throughout this time.

6. Handling of adults

Within 28 to 30 days of the eggs becoming infested, the adults start to show. They are either gathered using specimen tubes or aspirated using a motorized moth collector. To prevent inhaling scales, employees engaged in moth collection should always wear face moths. The gathered moths are moved, one thousand pairs at a time, to the oviposition drum. The 30 x 20 cm oviposition drums are composed of galvanized iron. The drums are supported by tripod frames with five-centimeter legs. Egg collection is made possible by the wire meshes on the drum bottoms. There are two opposing

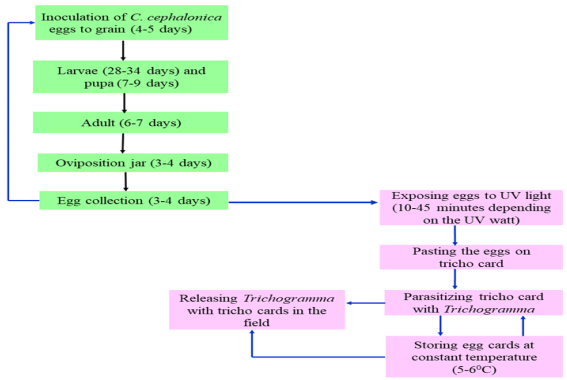
ventilation holes in the drum walls. Once more, wire mesh is used to conceal the ventilation apertures. Slots on the drum lids are used to introduce the adult meal and moths. After being filled in a single day, the oviposition drums are left for four to seven days in order to gather eggs. After that, they are emptied and cleaned for the following cycle of use. Feed with a honey solution is given to the adults. To make the adult feed, combine 50 milliliters of honey, 50 milliliters of water, and five vitamin E capsules. After soaking in the solution, a piece of cotton wool knotted with a thread is placed through the top slot of the drum.

7. Handling of eggs

The moths loosely deposit a lot of eggs. Together with the eggs, there are also more scales and damaged limbs. After years of employment in the *Corcyra* laboratory, they pose a risk to the employees. Every morning, the oviposition drums are raised, and a shoe brush is used to carefully clean the wire-mesh bottoms. After that, they are successively sent through sieves, and clean eggs are eventually gathered. Within the oviposition drums, around 100 pairs of adults lay 1.5 cc of eggs over the course of four days. On average, 2500 moths are gathered from each basin. Therefore, in 90 days, 18.00 to 20.00 cc of eggs can be collected from each basin.

8. Maintenance of history sheet

A precise account of each basin's history is required. The following details are provided, such as egg infestation date, date of feed preparation, origin of the egg, date of anticipated adult emergence, moths are collected every day, issues with the basin that arose during production and workers who are in charge of the basin.



Conclusion

Mass production of *Corcyra cephalonica* is a promising and scalable method for various industrial and agricultural applications. With appropriate management strategies and technological advancements, it can continue to play a significant role in integrated pest management.