A laboratory rearing technique for the spiny bollworm, *EARIAS INSULANA* Boisd. and some of its biological data

M.J. MORADESHAGHI

Assistant Professor, Agricultural College, Karaj, Tehran

Summary

A technique was developed to rear the spiny bollworm under controlled laboratory conditions. Field collected pupae of the spiny bollworm were held in refrigerator at 4°C. The pupae were transferred gradually to suitable conditions (60 per cent relative humidity and 27 to 30 degree Centigrade) to change to adult moths. To feed and handle the moths, the quart jars were fitted with vials filled with 10 per cent honey solution. The vial was plugged with cotton, and paper strips were placed in jar to prepare a place for oviposition and a stand for moths.

A malvaceous flower was placed in each jar to act as a phagostimulant for moths. One female and one male moth were kept in each jar. Our data show that the male insects (Fig.1) live on average 3-4 days, while the females (Fig.2) live for a longer time which is on average a week. The number of eggs per female varied from 1 to 173, and the females collected from the southern parts of the country had a higher number of eggs than those collected from the north. In general the average number of eggs per female was 46. The rate of oviposition was not uniform and varied with individuals. The incubation period was four days under the above mentioned conditions. Not all the eggs placed in the incubator were hatched. The results of this experiment revealed that the eggs are very sensitive to humidity, and get dry and crumple as humidity drops below 50 per cent for 24 hours. Also it was indicated that the eggs laid by the females that their pupae were collected before the cold weather, had a higher percentage of hatching than those collected after cold. Altogether about 70 percent of the eggs placed in incubator were hatched. The newly emerged larvae were very active, wandering around to find the desired food (Fig. 3). Head capsule in the newly emerged larva looked dark and broader than the body segments, but after two days feeding the body segments became as broad as the head (Fig. 4).

An attempt was made to rear the larvae on the diet developed by Shorey and Hale (1965) for Noctuid larvae, but no success was accomplished. Also chickpeas was soaked in water for 24 hours and tried to rear the larvae on it, but only about one per cent reached maturity. Finally cotton seed was soaked

in water for 24 hours, after peeling they were placed in cage where the new emerged larvae could reach it. This experiment revealed that the spiny bollworm may be reared on cotton seed in laboratory (Fig. 6). The advanced larvae could feed and pupate on chickpeas, provided they be fed on cotton seed during the first three larval stages (Fig. 5). About 73 per cent of larvae could get to adulthood when they were fed on cotton seed. The life cycle was completed in this rearing within an average of 24 days. Larval development last about two weeks, and they had a seven days pupal stage.

A saprophyte fungus named *Aspergillus* sp., carried with the samples collected from Khoozestan and Garmsar to the laboratory, whipped off our cultures. This fungus caused a very high mortality to the larvae. Young larvae were very much sensitive to the fungus. It is not clear whether the fungus kills the larvae by direct parasitism or it produces a toxin which kills the larvae. This fungus was observed on the body of dead and morbid larvae. Also it was seen on the cocoon of the alive pupae.

Head capsules of larvae of different stages were measured using adjusted micrometer. The data produced were as the following: lst stage, 0.3-0.45 mm; 2nd stage, 0.62- 0.80. mm; 3rd stage, 0.87-1.00 mm; 4th stage, 1.20-1.30 mm, 5th stage 1.42-1.65 mm.

Litrature cited

Avidov, Z. and ;. Harpaz; 1959. Plant Pests of Israel. Israel University Press. Jerusalem. P: 345-348.

Cartier, J.J.; 1968. Factors of host plant specificity and artificial diets. Bulletin of the Entomological Society of America. Vol. 14 (1): 18-21.

Davis, G.R.F.; 1968. Phagostimulation and consideration of its role in artificial diets. Bulletin of the Entomological Society of America. Vol. 14 (1); 21-30 .

Haidari, M.; Biology of the spiny bollworm. Entomologie et Phytopathologie Appliquees. Publication de l'Institute des Recherches Entomologiques et Phytopathologiques, Evin, Teheran, P: 54-72 (in Farsi, summary in English).

Mirzai, A.; 1966. The spiny bollworm in Gorgan and Gonbad. Published by The Plant Protection Dept. Ag. College, Tehran University (in Farsi, summary in English) .

Moradeshaghi, M.J.; 1968. Unpublished report on effect of some of the insecticides on the spiny bollworm population in Gorgan and Gonbad area (In Farsi).

Ripper, W.E. and L. George.; 1965. Cotton pests of the Sudan, their habits and control. Blackwell Scientific Publications, Oxford. P: 193-199 .

Salavatian, M.; 1956. The spiny bollworm and other cotton pests in Khuzestan and Garmsar. Published by the Plant Pests Research Dept. Ministry of Ag. Iran (In Farsi, summary in French.).