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PUPATION SITE AND COLOR OF THE PUPAL COCOON IN *EARIAS FABIA* STOLL (LEPIDOPTERA : NOCTUIDAE)

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Awdhesh Behari Tripathi and Simile Srinivasan Krishna (1983) Pupation site and color of the pupal cocoon in *Earias fabia* Stoll (Lepidoptera : Noctuidae). *Bull. Inst. Zool., Academia Sinica* **22**(2):273-275. Evidence, available from a laboratory study, points out for the first time that the formation of pupal cocoon color (brown/white) by *Earias fabia* Stoll during postembryonic development and the proportion of individuals possessing such colored cocoons are, interestingly and closely, linked (possibly an ecophysiological relationship) with the site of pupation within glass containers holding the larval diet (tender seeds of okra fruit).

During maintenance of a laboratory culture of the spotted bollworm, *Earias fabia* Stoll—a major pest of cotton and okra in the tropics (Lall, 1964; Mehta, 1977; Sohi, 1964; Wyniger, 1962)—on tender seeds of okra (Vishwapremi and Krishna, 1974) inside muslin cloth-capped glass containers (70 mm diameter; 90 mm height), an interesting association between the color of the pupal cocoon spun by the developing larva and the site chosen by it for pupation within the container have been observed. We examine this hitherto unknown phenomenon here.

MATERIALS AND METHODS

One hundred newborn larvae obtained from eggs taken from the above mentioned laboratory culture of the moths were singly allowed to continue their postembryonic development on tender okra seeds in glass vials (35 mm diameter; 100 mm height), each of which was closed at the top by a piece of white muslin cloth held by elastic bands. A fresh supply of okra seeds was provided daily to these growing immature individuals until the emergence of adults. Location for pupation selected by each caterpillar inside the tube and the hue of the tough silken cocoon woven by it to pupate within were determined separately for all the 100 individuals, each constituting a replicate. The entire investigation was conducted at room temperature ranging from 25°C to 29°C and R.H. between 80% and 100%.

RESULTS AND DISCUSSIONS

Fig. 1 displays dat arelating to percentages of larvae of *E. fabia*: a) pupating inside the experimental vial on 3 distinguishable sites (floor, side wall and on inner surface of muslin cloth covering the top open end of the vial) and, b) forming brown/white-colored pupal cocoon in relation to the pupal location.

A little over 60% of the caterpillars chose to pupate on the vial floor in contact with okra seeds and the pupal cocoon constructed by 68.9% of these individuals was brown in color. Between the other two substrates selected by the larvae for pupation, the muslin cloth binding the glass vial at the top was preferred instead of the side wall of the vial. However, in both these situations, the color of

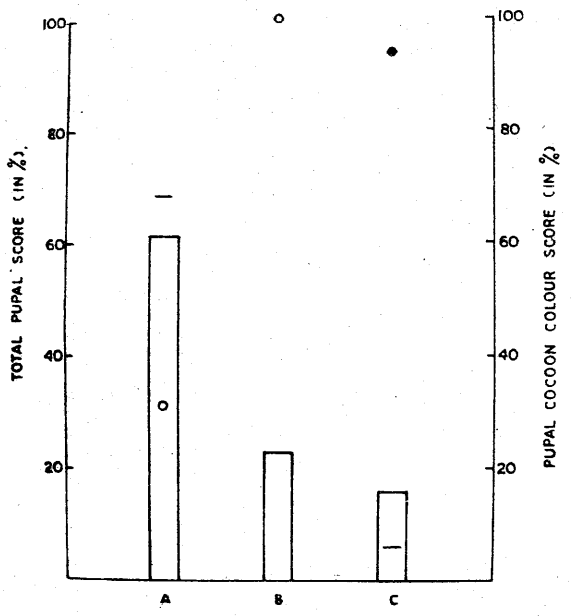

Fig. 1. Histogrammic representation of a) percentage of caterpillars pupating on floor in contact with okra seeds (A), on inner surface of the top muslin cover (B) and on side wall (C) within the experimental glass vial and, b) percentage of caterpillars forming brown/white colored pupal cocoon at each pupation site.

Full height of each bar in the figure represents percentage of pupae formed at each site in the entire experiment.

Level of herizontal line or position of circle within or above a bar shows the value pertaining to percentage of pupae with brown or white colored cocoon respectively.

the cocoon lodging the pupa remained, curiously enough, white in all but one case. This interesting feature in the developmental program of this pest appears to be the outcome of a delicate, nonetheless intricate, ecophysiological interaction involving the physical and/or chemical characteristics of the environment at the locus of pupation and the production and mobilisation of pigment(s) concerned with coloration in the pupating larva as in other insects (Wigglesworth, 1964).

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REFERENCES

LALL, B. S. (1964) Vegetable pests. In *Entomology in India* (N. C. Pant ed.). The Entomological Society of India, New Delhi. 187-211.

MEHTA, R. C. (1977) *Earias vitella* (F.). In *Diseases, pests and weeds in tropical crops* (J. Kranz, H. Schmutterer and W. Koch eds.). Verlag Paul Parey, Berlin. 478-479.

SOHI, G. S. (1964) Pests of cotton. In *Entomology in India* (N. C. Pant ed.). The Entomological Society of India, New Delhi. 111-148.

VISHWAPREMI, K. K. C. and S. S. KRISHNA (1974) Variations in the development program of *Earias fabia* reared on whole or excised fruits of okra or on their component. *Ann. Entomol. Soc. Am.* **67**: 147-148.

WIGGLESWORTH, V. B. (1964) *The life of insects.* The New American Library, New York. 383 pp.

WYNIGER, R. (1962) *Pests of crops in warm climates and their control.* Acta Tropica, Supplementum 7. Verlag fur Recht und Gesellschaft, AG., Basel. 555 pp.

夜蛾 (*EARIAS FABIA* STOLL) 化蛹地點與繭色

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由試驗室的觀察，初次發現夜蛾 *Earias fabia* Stoll 的繭色卽褐色或者白色和在室內玻璃皿中用不同飼料飼養的地點有關。此種後胚胎的發育以及有此種能力的個體數目都證實生態生理的互相關連非常重要。