

## **Larval feeding preference and body-color polymorphism in polyphagous moth, *Helicoverpa armigera***

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The cotton bollworm, *Helicoverpa armigera*, is a cosmopolitan noctuid species and one of major agricultural pests in many areas of the world, including Central and Southeast Asia. This species is highly polyphagous (Zalucki et al, 1986; Fitt, 1989) and has become a serious pest in Japan since its outbreaks in 1994 (Yoshimatsu, 1994). *H. armigera* shows various body-color patterns in its last-instar larvae (Ramos and Morallo-Rejesus, 1976) and its color patterns vary from totally green to almost black. Takahashi (2000) showed that the larval coloration was determined mainly by what they fed on, and environmental factors such as rearing density, temperature, and humidity had little influence. We reared larvae on various diets and showed that, even in the same host plant, larval coloration was strongly influenced by the parts on which they were fed; the larvae fed on leaves exhibited green coloration which was similar to that of leaves. It indicates that the larval coloration, especially green color, is highly cryptic and works as a camouflage. Absorption of spectra of larval haemolymph showed that the color exhibition of green color can be explained by the intake of much carotenoids from the diet and biosynthesis of bilin (blue bile pigments). It was shown that there was no critical period determining the body colorations of the last instar larvae.

Larval performance such as developmental period, mortality and pupal weight were also varied among larvae fed on different diets and it was shown that fruits were suitable for larval diets. We also showed that in some host plants, the larval feeding preference differed between instars. This indicates that larvae may move within a host plant and change feeding sites according to its growth. It gives account for the result that there is no critical period determining larval coloration, since larvae can change their body color into the coloration which is more similar to that of their feeding parts. However, further researches are needed to explain this hypothesis.