Effects of Juvenile Hormone and Head Ligations on the Succession of Cryptic Larval Color Patterns in Cerura vinula (Lepidoptera: Notodontidae)*

DETLEF BÜCKMANN

Received: 1994-03-01 / 1995-02-24
Accepted: 1995-04-07

BÜCKMANN D [Abt Allg Zoologie, Univ, D-89069 Ulm]: Effects of Juvenile Hormone and Head Ligations on the Cryptic Larval Color Patterns in Cerura vinula (Lepidoptera Notodontidae).- Entomol Gener 20(3): 133-142; Stuttgart 1996-01. --- [Article].

The color patterns of the different larval instars of Cerura vinula Linnaeus 1758 are described and their protective function is discussed. The cuticular melanization is stepwise reduced, in different parts of the pattern at different molts. In the wandering stage, a temporary appearance of epidermal ommochrome results in completely red animals. It is investigated whether the succession of different larval colorations is controlled by the Corpora allata through different levels of juvenile hormone (JH).

Head ligation at the end of a young larval instar, eliminating the Corpora allata, causes reddening of the whole epidermis without further development. Injection or topical application of JH before a larval molt causes uniform reduction of all melanin in the new cuticle. This effect does not mimic the stepwise reduction in different cuticular areas which occurs during the normal development.

It is concluded that the ommochrome formation at the wandering stage depends on the absence of JH. Head ligation inhibits, in young larvae, the distribution of JH but, at the same time, interrupts that of prothoracicotropic hormone [PTTH], so that a small ec dysone peak results in the absence of JH, similar to the situation at the wandering stage, when it evokes ommochrome formation, but not a complete molt. Excessive JH causes an unspecific melanin inhibition, which cannot, by itself, explain the normal sequence of larval melanization patterns.

Key words: Cerura vinula Linnaeus 1758 - corpora allata - ec dysone peak - juvenile hormone - larval color pattern - melanin inhibition - melanization - ommochrome formation

BÜCKMANN D [Abt Allg Zoologie, Univ, D-89069 Ulm]: Die Wirkung von Juvenilhormon und Kopfligaturen auf die kryptischen Larvenfärbungen bei Cerura vinula (Lepidoptera: Notodontidae).- Entomol Gener 20(3): 133-142; Stuttgart 1996-01. --- [Abhandlung].


* This paper is dedicated to the memory of Hans Piepho (1909-1993)