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Carbohydrate Content Variations in Chrysopa walkeri McLachlan (Neuroptera, Chrysopidae) during Its Prepupal Diapause *

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In the Chrysopidae, several ecological features of the diapause have been studied intensely, but no attempt to understand the physiology of the diapause was realized. In this way, the present work has been undertaken to clear up some aspects of the diapause in **Chrysopa walkeri** McLACHLAN by studying its glucidic metabolism. In this species, diapause occurs at the prepupal stage, induced in the laboratory by short-day light conditions, and terminates after a long time (about 5 months) at a low temperature ranging from 0 to 6°C. In southwest France, **Ch. walkeri** is a facultative multivoltine species exhibiting three generations a year (SAGNE 1984). Glucidic metabolism is studied by measuring weight changes of carbohydrates during diapause and during the cold exposure which permits reactivation of prepupae.

Simple glucosids and polyols are measured by gas-chromatography; glycogen content is determined, after hydrolysis, with a glucose analyser. Measurements are realized on the whole prepupa; each result is the mean of five analyses. Two temperature conditions are used: - the first one, simulating aestivation, is 20°C, - and the second, simulating overwintering, is 5°C.

Glucidic analysis shows that the glycogen and the trehalose are the major storage forms of carbohydrates. The glycogen level is constantly higher than the trehalose one. Polyol levels are very weak or undetectable. During diapause, the neosynthesis of glycogen and trehalose is probably realized by neoglucogenetic processes (e. g. GOURDOUX 1979). The results suggest also the existence of an interconversion between the two carbohydrates (e. g. MOREAU et al. 1981; SHIMADA et al. 1984). Polyols and trehalose, classically considered as cryoprotectant, do not reach high concentration during overwintering in **Ch. walkeri**; other components may assume the cryoprotection in this species. Measurements show a large variability in carbohydrate contents; in the population, individual reactions to environmental factors are very different, and this heterogeneity appears also in the physiological processes. This study, entirely new for Neuroptera, allows some comparison between lacewing- and other insect carbohydrate metabolism.

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