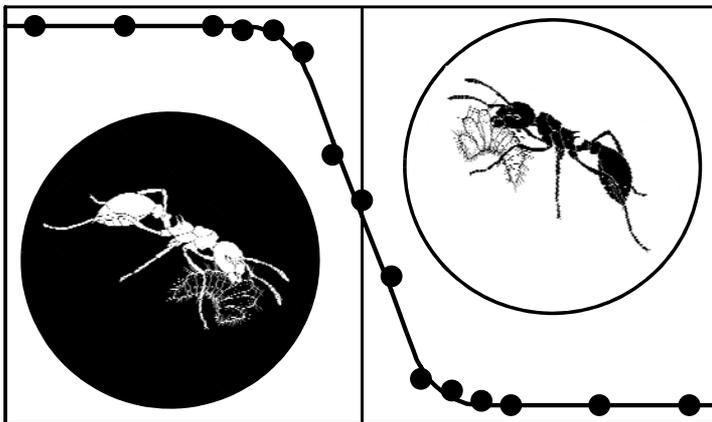


IVth European Workshop of Invertebrate Ecophysiology

St. Petersburg, Russia, 9 – 15 September 2001

ABSTRACTS

Edited by Vladilen E. Kipyatkov



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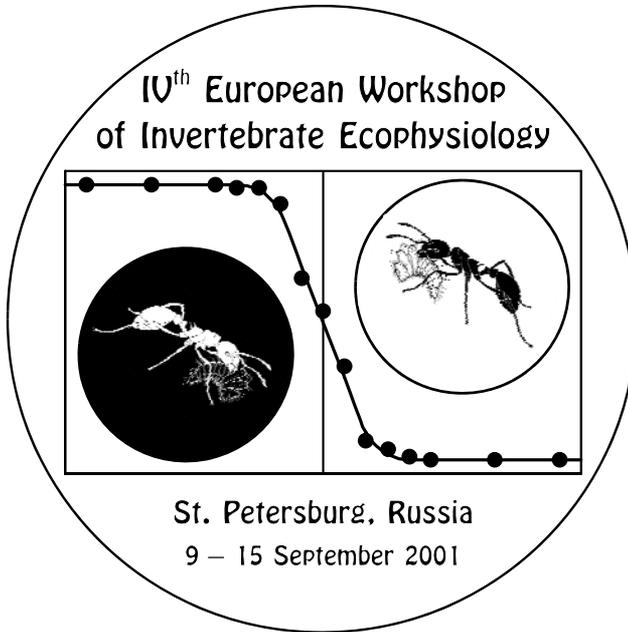
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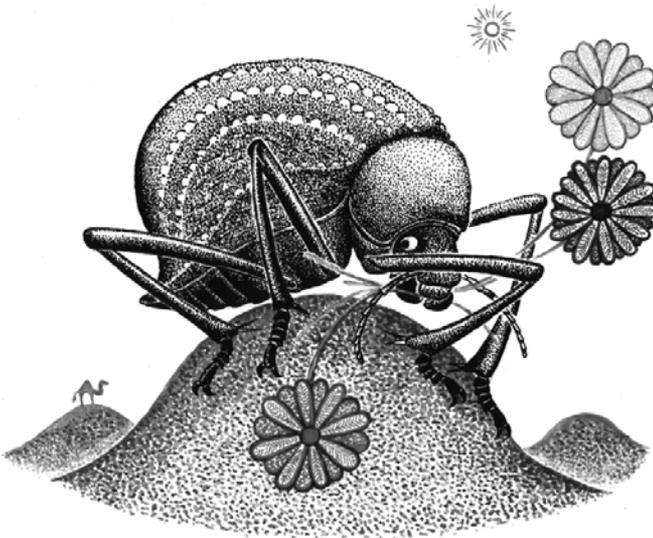
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Prof. Alexander S. Danilevsky
(1911 – 1969)

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Drawing by N. Yu. Kluge

Trophic diapause and its adaptive role in the annual cycle of eurybiontic species of lady beetles (Coleoptera, Coccinellidae)

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Together with winter diapause of adults, a so-called trophic diapause is typical for many predatory species of lady beetles. It is found most frequently in the regions with distinct dry and hot seasons. The occurrence of trophic diapause in species inhabiting tropical regions appeared surprising. This diapause has been revealed by Semyanov in two lady beetle species: *Leis dimidiata* (Fabr.) and *Harmonia sedecimnotata* (Fabr.) collected in the Southeastern China, somewhat to the south of the Tropic of Cancer (environs of Guangzhou). In spite of strong differences in climate, the above mentioned regions both possess a single common feature – the annual depressions in aphid abundance. Evidently, trophic diapause is not induced by climatic factors but by the absence of aphids serving as food. The induction of trophic diapause in beetles is accompanied by strongly decreased metabolism and by changes in behaviour: the thigmotaxis appears and the beetles move into shelters forming groups. In this condition beetles can stay without protein food for a long time.

The induction of trophic diapause in lady beetles is usually accompanied by gradual resorption of ovaries. A subsequent termination of the diapause needs some time for maturation; the duration of this period is equal to that observed after emergence of beetles from pupae or after overwintering. In *L. dimidiata* no complete resorption of ovaries occurs in a similar situation; secondary oocytes remain for at least three months. Therefore, even after three months of trophic diapause, the duration of pre-oviposition period is only about three days.

An adaptive significance of this phenomenon is evident: during a depression of aphid abundance females retain the ability to restart oviposition very rapidly after reappearance of aphids. In other words, a period between the beginning of feeding on aphids and oviposition becomes as short as possible, significantly increasing a probability for the successful development of larvae before the next possible depression in aphid abundance.

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