9. Various other arthropods

9.1 Determination of the lower lethal temperature of museum pests

The aim of these investigations is to determine the temperature necessary to kill a number of museum pest species by exposing them to low temperatures. To mimic the ”worst-case” conditions in museums, the insects are exposed inside a wooden block (material thickness: 9 cm) and total exposure time is 24 hours at temperatures that can be obtained in a household freezer in order to facilitate practical application in small museum units, so the practical application is simple. With wooden blocks of this dimension it takes 9 hours to cool the interior from 20°C to –20°C.

A series of trails have been conducted with *Anthrenus verbasci* to develop the experimental set-up. It is possible to determine when each single larva among a group of ten passes its super-cooling point. For *A. verbasci* this occurred at temperatures between –18 and –20°C, and all ten larvae died after exposure to –24°C. For *Tineola bisselliella*, ten larvae were exposed to –18°C; all ten died but only one larva passed its super-cooling point. This indicates that it may be possible to control some species of museums pests at higher temperatures than the –35°C that is recommended at present due to lack of precise information about the lethal temperatures. Investigations will be conducted on five species of dermestids, in as many stages as possible, and temperatures increased to determine the actual lower lethal temperature.

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9.2 Temperature preferences of the cat flea

The purpose of this study (financed by the National Science Council of Taiwan) is to obtain a better understanding of the distribution of cat fleas on the body of a cat. In a laboratory study the behavioural response of cat fleas to a temperature gradient is studied. The cat fleas are introduced to a closed chamber in which the floor temperature can be controlled from a computer. By setting up different temperatures in the two ends of the chamber the temperature preferences of cat fleas can be observed. For a comparison surface skin temperatures are measured on different body parts of a cat.

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