Efficiency and Health Hazards Tests on Vapona Used in Insect Collections

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The application of Vapona as a fumigant in insect collections was tested to replace the traditional paradichlorobenzene in the Transvaal Museum. In a number of tests the optimal quantity of Vapona was found to be 1/10 of a commercial strip (± 20 x 30 mm) applied in a collection drawer of about 35 x 45 x 6 cm. An application regime was worked out by transferring the Vapona pieces weekly into new groups of collection drawers, completing a fumigation cycle in 12 weeks. The Dichlorvos concentration in the air was tested on the body of the operator and in the room during various phases of the treatment. It was found that the measured concentration at no time exceeded 15 % of the Threshold Limit Value (TLV-TWA see Conclusions) on the body of the most exposed person and 2 % of the TLV-TWA in the room.

1 Introduction

The danger of damage that might be caused by museum beetles in natural history collections is high and the safety of specimens depends to a great extent on control measures taken. In insect collections, where a single larva of a museum beetle might destroy a number of specimens, the efficiency of control measures is particularly important. Annual application of a fumigant might be reasonably sufficient in a vertebrate collection but is certainly inadequate in an insect collection. From a range of insecticides and repellents used in the past, paradichlorobenzene became traditional in the Transvaal Museum. This insecticide, however, seems not to be sufficiently effective and some individuals permanently exposed to its fumes might develop complaints.

The most common museum beetle in South Africa is the flour beetle, Tribolium spp. [Tenebrionidae], but occasionally carpet beetles, Attagenus and Trogoderma spp. [Dermestidae], might also cause damage. The main period of possible infestation from outside is in spring (October-November) and may continue during summer till February-March. The breeding in an infested collection might be more or less continuous. The tenebrionid pests have a short life cycle of 6–10 weeks [Halstead 1967] and may produce several generations in a year. The dermestid pests, however, with longer life cycles, produce only 1 or sometimes 2 generations.

Larvae and imagines are equally susceptible to the toxic effect of Vapona [Vap]¹ (own experiments); the pupae and particularly eggs might survive fumigation if the period of

¹ Vapona; in further text: Vap