NSCG Newsletter

Title: Effective Freezing Strategies

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Source: Seddon, T. (1998). Effective Freezing Strategies. *NSCG Newsletter*, *Issue 8*, 27 - 30.

URL: http://www.natsca.org/article/724

of the members present and voting at a general meeting. The notice of the general meeting must include notice of the resolution setting out the terms of the amendment proposed.

15.2 No amendment may be made to clause 2, clause 3, 4, clause 12, clause 14, clause 16 or this clause without the prior written approval of the Charity Commissioners.

15.3 No amendment may be made which would have the effect of making the charity cease to be a charity at law.

15.4 The Trustees must:

a. promptly send to the Commissioners a copy of any amendments made; and
b. keep a copy of any such amendment with this Constitution.

16. POWER OF DISSOLUTION

If the Charity Trustees decide that it is necessary or advisable to dissolve the charity, they shall call a meeting of all members of the charity of which not less than 21 day's notice (stating the terms of the resolution) shall be given. If the proposal is confirmed by a two-thirds majority of those present and voting, the Charity Trustees shall have the power to realise any assets held by on or behalf of the charity. Any assets remaining after the satisfaction of any proper debts and liabilities shall be given or transferred to such other charitable institution or institutions having objects similar to the object of this charity as the members of the charity may determine, or failing that, shall be applied for some other charitable purpose.

NOTES

Elections of Trustees are staggered to ensure continuity. Currently, the posts of chair and editor are up for election in 1998, the Treasurer in 1999 and the Secretary in 2,000.

Hardiness of Anthrenus beetle.

The following article is an additional piece for our insert series on Agents of Decay; No.3 Pests.
Please note that follow up articles on any of the subject areas in the series are welcome at any time.

The *Anthrenus verbasci* beetles seem to be back in force this year already (mid Feb.) with some drawers of insects brought in by a visitor and already well infested.

One of the larval skins contained an adult beetle looking fresh and it was decided to turn it into a dry whole mount preparation for video microscopes. After being placed in the freezer overnight it recovered the next morning after 30 minutes at room temperature and was placed in 80% IMS for 8 hours. It was then removed from the IMS to dry out overnight so that it could be mounted the next morning. I fortunately covered it to prevent dust from contaminating it only to find that next day it was wandering around rather unsteadily under its glass cover!

Immersion in Formol acetic alcohol finally stopped its wanderings. For the time being our nitrogen tank still gives a thorough coup de grace even if they are becoming resistant to other ways of killing them.

Simon Moore
Hampshire Co. Council Museums

Effective Freezing Strategies

Simon's article (immediately preceding this one) clearly illustrates the hardy nature of .the *Anthrenus* species. Many readers will by now be most disheartened that their easiest, cheapest and least interventive method of pest control (i.e. freezing) has been exposed as severely flawed and unreliable.

Fortunately, considerable research has been carried out in the field of thermal insect eradication methods and specific guidelines established by the Canadian Conservation Institute (CCI, 1997) and Mary Lou Florian (Florian, 1997) to ensure effective treatments. The guidelines are largely based on lethal temperatures, and exposure times published in the entomological literature; anecdotal

evidence of successful treatments and knowledge of how insects survive cold has also been taken into account.

Basically, the research has indicated that all stages of all insect pests can be killed at low temperatures (high temperatures as well, but that is another story). At any given temperature below 0 ° C, different insect species will be killed at different rates. Also, different developmental stages of the same insect species will be killed at different rates, e.g. with webbing clothesmoth, *Tinneola bisselliella* it seems the adult and the egg are easier to kill than the larva (Strang, 1992, p43, ref 111). Indications are that at -18°C to -20°C all stages of *Anthrenus verbasci* can be killed in 2 hours (Strang, 1992, p42), while *Tinneola bisselliella* at the same temperature will take one to two days to die (Strang, 1992, p43).

Domestic freezers will usually achieve around -18°C (if in good order and not too frosted up), specialist freezers and cold rooms (e.g. for the food industry) might go down to -30 ° C or -40 ° C.

So, how come Simon's low temperature treatment failed? Almost certainly a low enough temperature was not achieved for the short period of exposure - maybe his freezer doesn't go down to -20°C, maybe it needs defrosting, maybe it was too full and there was inadequate air circulation around the drawers. Also, time must be allowed for the core temperature of the items being treated (the drawers) to reach the minimum temperature of the freezer. In fact, CCI's practical recommendation for low temperature treatments is -20 ° C for one week (CCI, 1997, p2).

Until a few years ago double freezing was fashionable (freeze, warm to ambient temperature, freeze again). In recent years it has been shown that this is unnecessary if a low enough temperature (the thermal, mortality threshold) can be achieved, and maintained for the requisite period of exposure - saving on energy consumption, staff time and object handling (possibly). However, if you can not get a low enough temperature to achieve a 100% kill in a single exposure (usually -20 °C or lower), then exposure to a higher temperature (e.g. -8°C) with a subsequent second exposure is likely to do the trick (Strang, 1992, p50). Alternatively, it has been suggested that at temperatures higher than the lethal exposure threshold a 100% kill can be achieved by extending the treatment time., However, for a single exposure, a temperature lower than -15°C is to be recommended, as insects can achieve short term cold adaptation to this level (CCI, 1997).

So,

- Be aware - and check regularly what temperature your freezer can achieve.
- Take into account what species of insect(s) you are trying to eradicate and assume that all developmental stages right be present.
- Calculate the duration of exposure needed (CCI, 1997, p2) and freeze for at least this lengh of time.
- Allow additional exposure time for the core temperature of the item(s) being treated to reach the minimum temperature of the freezer. The treatment temperature must be achieved relatively quickly throughout the object - i.e. within 1.2 hours at most - if not, the insects might have time to adjust, enabling them to survive treatment.
- If the temperature can not be constantly maintained, e.g. if the freezer is periodically opened, extend the treatment time.

It is worth working to the worse case scenario, i.e. assuming you might have the most resistant species and stage - a longer freeze time will not damage objects/ specimens. Needless to say, the specimen must be adequately 'bagged" throughout the procedure (CCI, 1997).

References

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4. **Strang, Thomas J K,** The Effect of Thermal Methods of Pest Control on Museum Collections, in Preprints, International Conference on Biodeterioration of Cultural Property, 4-7 July, 1995, Bangkok, Thailand, 199-218.

5. **Florian, Mary-Lou,** Heritage Eaters: Insects and Fungi in Heritage Collections, James & James, London, 1997, p73.

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Information Wanted

Plastic block deterioration

Our SEARCH educational unit fairly recently purchased some specimens embedded in clear resin from a firm in Germany (since gone out of business). Over the past two years these blocks have become surface pitted with small marks about 1mm diameter and about 200 microns deep, giving a slightly clouded appearance. The pitting can be removed by grinding and polishing the blocks. The pitting only occurred on those surfaces that are regularly touched suggesting that the blocks should either be wiped after use or that hands should be cleaned with some appropriate agent before handling these blocks.

The blocks are made of a different type of resin than the usual polyester clear resin, provided via Tiranti, and I have so far been unsuccessful in finding out what this German resin comprises. Blocks made from the Tiranti resin have undergone similar handling but show no signs of deterioration apart from the odd and inevitable surface scratch.

Any advice or useful comments would be most welcome.

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