



MANL Notes

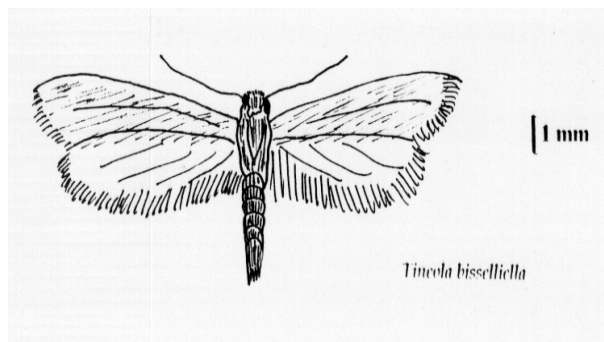
Care of Collections

A Publication of the Museum Association of Newfoundland and Labrador

TREATING MOTH INFESTED COLLECTIONS: THERMAL ERADICATION

This easy and effective treatment can be done for any museum as long as a chest freezer is available. Thermal eradication is a safe and effective alternative to the more hazardous chemical fumigation techniques. It is important to follow the described guidelines in order for the treatment to be successful.

Moths can be a threat to any museum collection. There are two types of moths: the Common Clothes Moth (*Tineola bisselliella*, family *Lepidoptera*) and the Casemaking Clothes Moth (*Tinea pellionella*, family *Lepidoptera*). Organic keratin-containing materials are the prime target of these moths. Such materials include wool, hair, feathers, baleen (whale bone), horse hair, felt (especially that inside pianos), horn, claws and hooves. Though these are the primary food sources for the clothes moth, it will penetrate other substances like cotton, silk and nylon possibly damaging adjacent objects in order to reach its targeted source.

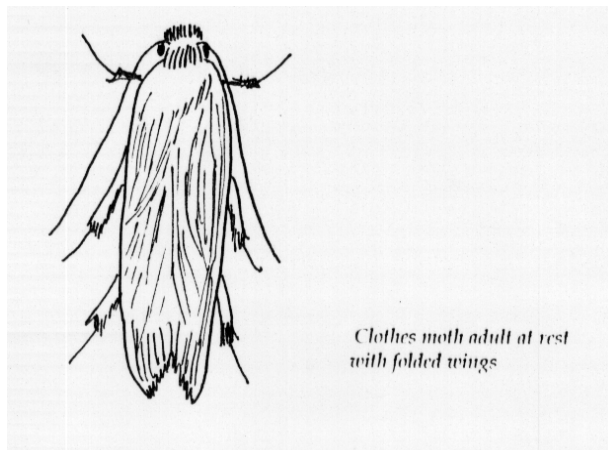


In Newfoundland, moths are most prevalent during the spring and fall (warm, humid conditions), though bear in mind that pests are always around. For seasonal museums, this may mean that moths are around during the warmer times of the closed season. This makes sense knowing that moths like dark, dirty and quiet areas. During the open season, with increased lighting, commotion and more frequent cleaning, moths stand less of a chance of damaging museum collections. Frequent inspections of the collection during the off-season is a good preventive measure to help guard against infestations.

If a clothes moth is spotted flying around the collection or storage areas, it often means that some damage has already been done. This is because it is the larvae and not the actual moth which does the damage. It is important to eliminate the larvae as well as the moth since the moth can still mate and lay eggs which will give rise to more larvae.

Upon detection of an infestation, a thorough search for larvae must be conducted and treatment begun. Moths hide in dark areas, shun the light and preferentially attack dirty objects. It is important to inspect every object which is a target for larval attack including wool clothing, feathered and quilled objects, piano felts and horse hair furniture. Thorough inspection includes looking in pockets, under lapels, in armpit and groin areas, within seams, folds and pleats etc, anywhere dark and dirty.

Once inspection has begun, suspicious artifacts should be removed and thoroughly cleaned. This involves brushing and vacuuming in an attempt to remove all insect debris, larvae and eggs. Upon cleaning, each piece should be individually bagged in clear, polyethylene plastic. The bag should be air-tight with excess air removed. Each artifact should be labelled with a tag outlining its condition after cleaning in order to monitor for new damage. The incidence of repeat infestation is high and one must know if the damage is old or new. Thorough documentation is key to successful pest management.



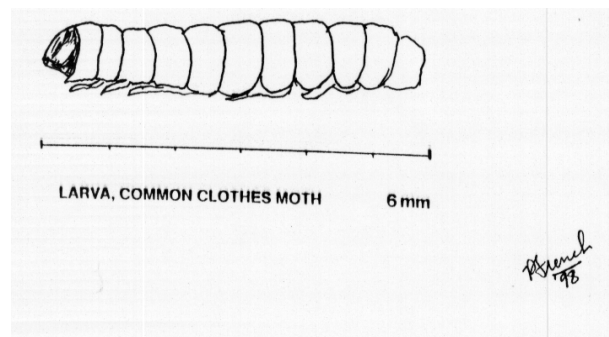
When each piece is properly bagged, tagged and documented, it should be allowed to acclimatize to room temperature. This will prevent condensation and eliminate relative humidity changes inside the bag upon introduction to the freezer environment (which is good for the artifact) as well as help shock the critters. Freezing must be done quickly and sustained for a certain period of time in order to be effective. (-20°C for a minimum of 48 hours) If the cold temperatures are not reached fast enough, or are not sustained, the pest can acclimatize and survive the freezing process. Some insects have super-cooling abilities where their body produce fluids which allow them to survive the freezing temperatures. Freezing must occur rapidly in order to override these abilities.

Common chest freezers are ideal for this treatment, provided they are not too full. The more items in a freezer, the less air circulation and the longer it takes to reach and maintain the

colder, effective temperatures. If reaching the appropriate temperature is not possible, simply ensure that a cold temperature is maintained for a longer period of time. This will help the procedure be more effective. It is important not to use frost free freezers since these do not maintain a steady temperature. Instead, the temperature constantly increases and decreases in order to prevent frost formation.

Once the artifacts has been frozen at -20°C for at least 48 hours, they can be removed from the freezer. Slow thawing for at least 24 hours is essential for acclimatization to room temperature. This will help ensure the integrity of the piece. Repeating the freeze-thaw procedure several times is more effective than just doing it once. Repetition will help ensure eradication of all pests and prevent the possibility of their super-cooling and acclimatization. Not until the process is complete and the piece has reached room temperature can the seal on the bag be broken.

If chest freezers are neither abundant nor available, approach local business where one such item might be found. Arrangements could be made with local fish plants (such as they are) or other business to use their facilities if the need arises. They may require that the collection be contained and kept separate from their supplies so crates may be required. If so, plan to have crates or other such containers on hand. Preparing for pest eradication in advance will help it run more smoothly.



Strang, Thomas J.K. "Preventing Infestations: Control Strategies and Detection Methods," *CCINotes* 3/1. Canadian Conservation Institute, Ottawa: 1996.

Strang, Thomas J.K. "Detecting Infestations: Facility Inspection Procedure and Checklist," *CCI Notes* 3/2. Canadian Conservation Institute, Ottawa: 1996.

Step by Step Guidelines

1. Thorough inspection, segregation and cleaning
2. Bag artifact in air-tight clear, polyethylene plastic
3. Acclimatize to room temperature before freezing
4. Freeze at minimum temperature of -20°C for at least 48 hours (or higher temp for longer time)

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5. Slow thawing to room temperature (at least 24 hours)

6. Repeat freeze thaw cycle immediately

7. Do not break the bag's seal until process is totally finished and room temperature is reached

8. Thoroughly clean in preparation for storage

Notes:

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