

Care and Preservation of Pinned Insects

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Pinning is the most common method of preserving insects. Insect pins today are made of stainless steel with outer layers of enamel and a resin head. Pinned insects are mounted on foam unit trays in wooden or metal drawers, which sit in cabinets.

Hazards

- Older insect pins were made with brass or copper, which reacts with lipids in the insect's body over time to produce *verdigris*, a waxy substance which looks like green metal filaments. Verdigris can destroy a pinned insect if allowed to continue.
- Insect collections were historically preserved against pest insects with naphthalene mothballs. This is not recommended anymore, as naphthalene can be harmful to human health.^[1]
- Insect pins are sharp—beware!

Handling

- Only handle a pinned insect by the head of the pin. Do not touch the insect.
- Pull the pin out of the foam as vertically as possible. Moving to one side as you pull up can cause the pin to flick as it leaves the foam, potentially damaging the insect.
- When replacing an insect in its tray, push the pin into the foam as far as it will go without bumping the insect's labels or legs into the foam.

Storage

- Pinned insects should be placed in straight rows in their trays. The insects should not touch each other, and their labels should not overlap.
- Insect drawers should seal to protect the specimens from pests and environmental extremes. Cabinets should also seal to

- protect against pests, environmental extremes, water, and light.
- Pinned insects should ideally be stored with the pins sitting vertically in a horizontal foam substrate. However, they may be displayed on a wall with the pin affixed horizontally in a vertical foam substrate.
- Do not display insects in direct sun. Indirect and low-UV light is best for display purposes.

Agents of deterioration

- Ideal conditions: 35-55% relative humidity, 72°F or lower, in a collection room away from windows. Conditions are most ideal if they discourage mold and insect pests like dermestids.
- Relative humidity: pinned insects can quickly mold if subjected to a humid environment.^[2] High humidity can also cause wooden drawers to give off acidic gases, which can corrode insect pins. Lower humidities tend to suppress pest activity.
- Temperature: pinned insects that have been properly dried after pinning can withstand cold temperatures and freezing. Too warm a storage temperature can spur mold growth and attract pests. Lower temperatures tend to suppress pest activity.
- Pests: the largest threat to insect collections is live insects. Once they have infiltrated a collection drawer, dermestid beetle larvae and book lice can destroy pinned insects. Always look for shed larval exoskeletons (exuvia) and larva poop (frass) in your collection drawers; regular collection checks are recommended. Never eat food in your collection space, and make sure to keep floors clean. If you suspect dermestids have gotten into a drawer, freeze it for at least 72 hours —and ideally 1-2 weeks.^[1] Monitor for dermestids and other pests with sticky traps around your collection space.
- Light: pinned insects' colors can quickly fade if subjected to direct light.^[2] Always make sure cabinet doors are closed. If an

insect drawer is to be kept out on a work bench for more than a few hours, it should be covered with a sheet of cardboard or fabric when not in use.

- Human error: pinned insects often have many appendages that are fragile and will easily break off a specimen—legs, antennae, and wings especially. When handling or moving a pinned insect, move slowly and carefully. Disembodied parts like legs, wings, or heads can be reattached with the use of white Elmer's glue or another water-soluble glue.
- In the event of a flood in the collection space, remove drawers from impacted cabinets once it is safe to do so. Move drawers to a safe, dry space and stack them in an orderly manner—usually one stack per cabinet. Put one empty drawer on the ground before stacking specimen drawers on top. You can rotate the drawers 30 to 45 degrees with respect to the drawer below to allow for air flow to dry out the drawers. Inspect the drawers regularly for any pest presence or mold growth.

Labeling

- Insect labels are very small—typically only the information immediately relevant to the specimen is recorded on the labels. Accession numbers and other additional data are usually housed on the specimen's entry in the collection database.
- There are often multiple labels on an insect pin. Museums may have their own preferences for label order, but often the labels will be ordered as follows:
 - The top label, nearest the insect, is the locality label. It should include where the insect was collected (country, state, county, nearest town, GPS coordinates, and elevation), when it was collected (in an unambiguous date format like “29 July 2019”), and who collected it.^[3]
 - There may be additional locality labels beneath, like a label describing the plant the insect was found on or detailing additional collectors.

- A determination label, including the identity of the specimen to the lowest taxonomic level possible, who identified the specimen, and what year they made their determination.
- If the specimen has a human-readable ID number, it should be displayed right-side-up.
- If the specimen has a machine-readable barcode or QR code, it will be displayed upside-down as the bottom label on the pin to facilitate scanning.

Monitoring

- Unless a specimen's continued existence is threatened by the debris on it (such as verdegriis), do not clean a pinned insect. An intact but dusty specimen is better than a broken, clean one.
- Do regular checks in your insect drawers to ensure there is no dermestid activity. If you see frass or exuvia, freeze the effected drawers.^[1]
- Keep sticky traps around your collection space to monitor for insect pests. Remember to check them regularly: monthly or quarterly is ideal. A trap left out for more than six months at a time loses temporal resolution to the point of being useless.

References and additional resources

- [1] “[Entomology Collection Dermestid Protocols](#),” Hillary Morin, 15 March 2016, *Frost Curators' Blog*.
- [2] “[Preservation Considerations](#),” *Texas A&M AgriLife Extension*.
- [3] “[Museum Specimen Preparation Guidelines](#),” J. Heraty, D. Yanega, & S. Triapitsyn, *UC Riverside Entomology Research Museum*.

Further reading:

- “[Curation of Insect Specimens](#),” September 2006, Number 11/8, *National Park Service Conserve O Gram*.
- “[Policies](#),” *Frost Curators' Blog*.