OSAC REVIEW SPRING 2025 (OSAC = Organization of Scientific Area Committees)

NAME OSAC UPDATE #25: OSAC 2022-N-0039 (OSAC Proposed)

Standard for the Collection and Preservation of Entomological Evidence from a Terrestrial Environment

This Standard was developed by the Crime Scene Investigation and Reconstruction Subcommittee of OSAC. It has been submitted to a standards development organization and may change as it undergoes revisions in that consensus-based process.

(Like all OSAC developed Standards, Best Practices, and Guides, these are voluntary and separate from NAME standards and accreditation.)

*This is a brief summary of O*SAC 2022-N-0039, and as such may leave out or misinterpret important details. **See link to full document (below).**

As part of the OSAC process, this document was subject to an open comments period with adjudication. This is a link to the comments received and their adjudication:

https://www.nist.gov/document/2022-n-0039-combined-comment-adjudicationfrom-sc

Value:

This *Standard for the Collection and Preservation of Entomological Evidence from a Terrestrial Environment* is primarily for crime scene investigators but overlaps with our Medical Examiner work. Forensic Pathologists, and in some jurisdictions, medicolegal death investigators, are asked to collect insects independent of crime scene investigators. This standard could be used as a training document. Annex A is a list of field equipment and sampling equipment for insect evidence that could be the framework for a scene kit for this purpose. Annex B is a series of photographs of the life stages of flies, useful for training new staff members.

Scope:

Provides the standards for collecting entomological evidence for both preservation and rearing. Entomological evidence is used to estimate the time of insect colonization, and in cases where neglect or contamination are issues because humans have been colonized with insects.

In the general considerations sections, care is suggested in avoiding cognitive bias, such as contextual bias as in learning when the victim was last seen alive.

Documentation Specific to Entomological Evidence:

- Body diagrams/photographs to indicate locations of insect colonization
- Environmental conditions at the scene
- Date/time of body discovery
- Any times and details relating to specimen collection
- If specimens are collected at autopsy:
    - Time of body refrigeration
    - Time removed for autopsy
    - Temperature of refrigeration and autopsy room
- At the scene:
    - Hourly temperature
    - Body surface temperature
    - Maggot mass temperature
    - If samples are taken from the soil, soil temperature

Collecting Specimens:

- Collect at least 50 specimens, if available of all life stages
- Place in appropriate containers and do not mix samples from different body locations
- Live samples for rearing shall not be commingled with different life stages, or collected from different parts of the body
- For each preserved sample, a comparable live sample should also be collected.

- Appropriate life stages shall be collected from on and around the body keeping in mind that early stages can be small, and later stages can be dispersed around the body.
- For larval samples, collect a full range of sizes
- Label appropriately including body site of collection and ethanol concentration, if relevant.

For Preservation Samples:

- To prevent decomposition, kill larval or pupal samples by immersion in hot water (at least 80° C/176°F) for at least 30 seconds, then placed in a container with 70% Ethanol.
- Egg specimens can be placed directly in Ethanol.
- Adults can be stored dry, frozen, or placed in a container with a liquid preservative.

Temporary Storage of Immature Samples for Rearing:

Samples to be reared to adults are to be placed in a breathable container that prevents escape, and stored in a room with a known temperature for transferring for rearing by 24 hours.

For Bodies Discovered Indoors:

- Thermostat temperature and settings, and air temperature
- If windows/door are open, presence of insect screens
- If sample came from a site in direct sunlight
- Presence of decomposing food or feces
- Potential points of insect entry such as gaps in walls
- Larvae may travel further from the body indoors, instead of burrowing into nearby soil in the outdoors.

For Bodies Discovered Outdoors:

- Note whether the body was in the sun or shade
- Once the body is removed search the soil underneath for insect activity, as deep as 10 cm.

Insect Evidence Recovered during Autopsy:

- Collect insects as soon as possible after the body is removed from refrigeration.
- Ticks, lice, and fleas can be collected and placed in 70% Ethanol. Note whether the insects were alive when collected. Document any insect artifacts on the body, such as insect feeding sites

Wrapped and Confined Burials:

- Collection is the same as for other bodies but buried bodies require an increased search of surrounding soil
- If the body is wrapped, insects may be found in the wrapping.
- For confined spaces, consider the search for insects more like an indoor scene, as insects can be found in seams or crevices, since there is no soil.

Full Document:

https://www.nist.gov/document/osac-2022-n-0039-standard-collection-and-preservation-entomological-evidence-terrestrial