DNA analysis through crop dissection from different species of fly larvae for forensic investigation

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Forensic entomology focuses on the study of dead bodies through the arthropods that inhabit them. The goal of the research being conducted was to successfully identify the insect species, observe the time periods in which the insects emerge, extract DNA from a maggot's crop (stomach) and be able to identify specifically where the DNA is from. This was accomplished by setting out traps of store bought meat and collecting the maggots that formed on the rotting meat. Control maggots were also collected and allowed to grow into adults to be able to identify the types of flies that are consuming the meat; another set of controls were collected and stored in 95% ethanol. The maggots collected for dissection were also stored in 95% ethanol. The crop within each maggot was carefully removed using a scalpel and observed under the digital microscope. A silica based extraction technique was utilized that allowed for the binding of DNA to silica surfaces under specific salt and pH conditions. Obtaining DNA from insects provides crucial information in criminal cases such as the location(s) of a corpse in the event that it has been moved, the identity of an individual, and/or the time of death. Varying methods exist on how to inspect insects; In this specific study, crops of fly larvae were analyzed to better understand how forensic entomology contributes to criminal investigation.
Keywords: forensic entomology, sampling, dissection, DNA analysis.