



D23 To Sort a Fly: A Simple Apparatus Built From Ordinary Materials, Using Ice as a Coolant for Sorting Live Blow Fly Specimens

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After attending this presentation, attendees will learn an efficient, easy and inexpensive way to sort hundreds of gravid female flies from wild collected multiple species assemblages from over carrion.

This presentation will impact the forensic science community by creating greater precision in time of death (postmortem interval) estimations by using the presented entomological sorting technique.

Forensic entomology researchers are revisiting and re-evaluating growth and developmental data from previous growth studies due to differences of preferred methodologies in analytical approaches to case evaluations. The multiple protocols used in the earlier growth studies have led to discrepancies in the understanding of what is actually being reported in these studies. For example, there have been discussions of differences between a study conducted by Kamal in the 1950 and another by Greenberg from the 1990s for the development tables of calliphorid (blow flies) species. These two studies cannot truly be compared with respect to the length of time between stadia (an insect stage duration) due to the fact that one study (Greenberg) assess the minimum time of development and the other (Kamal) looks at the mode duration. This is apples and oranges. However, some in the forensic entomology community are attempting to re-evaluate the development of the most common species of blow flies found in the forensic case records. To accomplish this, rearing protocols developed by Wells appears to be a sound and reliable methodology for this re-evaluation, but requires hundreds, if not thousands of eggs all being deposited within one to no more than two hours. Anesthetizing several hundred wild collected blow flies of multiple sex and species and then sorting only females of a single species is very difficult and requires expensive equipment (a cooling table). An inexpensive method is proposed here using houseware cake pans, an ice crusher (blender), a freezer, and a refrigerator. An inexpensive apparatus can be constructed from a few items in the houseware area at any department store. A rectangular cake pan, which is approximately 12"X22" with a plastic lid, will provide the base portion of the unit (Unit A). Use a square aluminum or steel cake pan (Unit B) for the inside element which has smaller dimensions (e.g. 9" X 9") and will fit into the larger rectangular cake pan (Unit A) with an inch or two of space around each side. Also, Unit A should have a greater depth than Unit B for space under the smaller unit. Cut a hole in the plastic lid of Unit A which Unit B will fit through (try to keep it a snug fit). Your coolant will be a mixed slurry of finely chopped ice (use an ice crusher rated blender) and water. Pour enough water into the ice so that it is slushy and will fill in the bottom and sides surrounding Unit B. This maintains a temperature which keeps the flies inert in Unit B. Unit B is your sorting tray and will be surrounded on the bottom, and all four sides with icy water. If buoyancy is a problem, Unit B can be weighted down with weights or two large rubber bands can be placed around Unit A and Unit B to hold the sorting pan down into the icy water. Pre-cool Unit B in the freezer for several minutes before placing into the ice bath. You will need additional temporary storage containers for the sorted specimens. A "small" "Mosquito Breeder" (BioQuip) with the collecting cone inverted into the base makes for quick placement of the specimens and the inverted cone prevents them from escaping back out once they regain flight. When testing the flies from your geographic area, you may find that the slushy ice water bath is not cold enough; you can add salt to lower the temperature of the ice/water mixture. If it works for ice cream, it will work for the flies, too.

The procedure will enable easy procurement of hundreds of gravid female blow flies of a selected species for obtaining thousands of eggs. These eggs can then be reared to different life stages for evaluating growth and development durations of any blow fly species. These data will then be used for greater precision in time of death (postmortem interval) estimations.

Forensic Entomology, Blow Flies, Sorting