G100 Generating Development Data for Forensically Important Flies That Are Difficult to Rear in the Laboratory

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After attending this presentation, attendees will learn how carrion fly development data can be obtained for species that are not suitable for rearing under common laboratory methods.

This presentation will impact the forensic community by providing rearing techniques for blow flies that have minimal development data due to their difficulty to rear in a laboratory setting. With these data forensic entomologist can generate more accurate development data for commonly encountered forensically important blow flies leading to increased accuracy and precision in postmortem interval estimations.

Forensic entomologists have so far been unsuccessful in their attempts to establish laboratory colonies of some of the more commonly encountered carrion insect species. Therefore, it has been difficult to produce the growth models often used to estimate a minimum postmortem interval based on specimen age of these species. Notable examples of this technical problem in North America are the green bottle flies *Lucilia illustris* and *Lucilia coeruleiviridis*. It has been found that a wild-caught *L. illustris* female will lay eggs in a laboratory cage, but the resulting f1 generation will not mate under these standard rearing conditions. *Lucilia coeruleiviridis* presents an even more difficult problem, in that post-feeding *L. coeruleiviridis* larvae, either collected from a corpse or obtained from a wild adult female, will not pupate under laboratory conditions. The larvae have been observed to go into an extended wandering stage lasting several days only to eventually shrivel and die.

It was hypothesized that post-feeding *L. coeruleiviridis* larvae require a larger pupation medium volume than is typically used for laboratory culture. The hypothesis that rearing *L. coeruleiviridis* eggs obtained from wild females in containers much larger than those used in this research would have an effect on their development was tested. *Lucilia illustris* was similarly investigated because of the lack of developmental data currently available for this species as well.

During midsummer at the study site in northwest Indiana, 11 piglet carcasses were exposed to short duration (max 2.5hrs) fly activity and inspected for eggs every half hour. Once eggs were observed, the piglets were individually placed on (approximately 0.11 m^3) leaf litter, collected on site, in large plastic storage tubs (approximately .16 m^3). Breathable cloth-like material was immediately secured over the plastic tubs to exclude further oviposition. Ambient (outside) and interior container temperatures were monitored. Adult flies that emerged from a container were collected daily and identified.

Aspects of development will be discussed for three of the blow flies that were successfully reared to adulthood in this experiment; *L. illustris*, *Lucilia sericata*, and *L. coeruleiviridis*. Physiological time calculations for *L. illustris* were compared to those reported by other authors. Both *L.coeruleiviridis and L. illustris* developmental data were contrasted to the extensively studied *L. sericata*, because some investigators have usedl *L.sericata* growth models to estimate *L. coeruleiviridis* age. Under these conditions *L. coeruleiviridis* total development time was numerically longer than that of *L. sericata*. Total development time of *L. illustris* was comparable but slightly more accelerated than that of *L. sericata*.

The procedure used in this experiment provides forensic entomologists with a means of obtaining growth rate data for flies that were previously difficult to rear. Having data on these forensically important flies can be used to increase precision and accuracy of estimations of the postmortem interval.

***Lucilia*, Postmortem Interval, Forensic Entomology**

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