



Pathology & Biology Section – 2005

G12 A Field Study of the Foraging Behavior of Blowfly Maggots

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After attending this presentation, attendees will understand the possibility that the largest blowfly maggots found on a body may be relatively recent arrivals, having crawled over to the fresh remains when their initial food source (e.g., a dead mouse) became depleted, resulting in the risk of significant errors by investigators attempting to calculate postmortem interval.

This presentation will impact the forensic community and/or humanity by alerting the forensic community to the possibility that if foraging behavior by food-deprived blowfly maggots is a reasonably common phenomenon, larger (older) blowfly maggots that have managed to find their way to a fresh body can be a source of large errors when investigators attempt to calculate postmortem intervals based on published rates of maggot development times. On the other hand, foraging by fooddeprived blowfly maggots could also provide a possible explanation for the presence on bodies of anomalous maggots that are larger than expected according to other independent evidence.

It is generally assumed that the largest, and presumably the oldest, blowfly maggots (i.e., larvae of Calliphoridae) found on a body initially arrived as eggs deposited by flies attracted to the remains. There is the possibility, however, that at least some of the large maggots crawled over to the body from some other piece of carrion in the immediate environment. For example, if a body is dumped in a field near the remains of a dead mouse, and if the mouse remains had been nearly consumed by blowfly maggots, at least some of the maggots may abandon the depleted mouse remains and crawl over to the fresh food source, greatly complicating the situation for forensic entomologists. During the late summer of 2003 and the late spring of 2004, field studies were conducted of the foraging response of blowfly maggots feeding on a depleted, or nearly depleted, food source. The field studies were conducted in cages that excluded vertebrate scavengers but not blowflies and other invertebrates. The experimental situation was manipulated such that the maggots were presented with three choices: (1) remaining on a low quality and rapidly deteriorating food source, (2) abandoning the deteriorating food source and crawling approximately 45 cm across bare soil to a shelter containing a moist cloth and a fresh food source, or (3) abandoning the deteriorating food source and crawling approximately 45 cm across bare soil in the opposite direction to a shelter containing a moist cloth but no food.

In every cage at least some maggots remained on the deteriorating food source until it had either been consumed, dried out, or the experiment was terminated. However, during the late summer experiment of 2003, in 6 of 12 test cages, early third instar maggots of *Lucilia* sp. abandoned a deteriorating food source (i.e., a nearly consumed and/or rapidly desiccating piece of liver), and crawled across the bare soil to reach the shelter containing the fresh food source (approx. 40 gm of fresh beef liver) and began feeding. Similarly, during the late spring experiment of 2004, in 6 of 12 cages, early third instar maggots of *Phaenicia* sp. exhibited the same foraging behavior. The number of foraging maggots that crawled into the food shelters varied greatly, ranging from 1 – 2 individuals (4 cages) to more than 100 (3 cages). In one cage at least 387 maggots, as confirmed by rearing the adult flies (*Lucilia* sp.), had crawled into the food shelter. Although there were 7 cases where maggots crawled into shelters that contained only a moist cloth, the numbers were much lower. In 5 cages where maggots had crawled into the food shelters, one maggot in each cage moved in the opposite direction and crawled into the non-food shelter. In two cages where no maggots had crawled into the food shelters, a single maggot in one cage, and two maggots in the second cage, crawled into the non-food shelters. Finally, in 10 cages no maggots crawled into either shelter.

Blowflies, Maggots, Foraging