



## Pathology Biology Section – 2010

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### **G73 Lower Temperature Threshold for Black Soldier Fly (Diptera: Stratiomyidae) Egg and Adult Eclosion**

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After attending this presentation, attendees will learn the lower developmental threshold dynamics of temperature that either facilitate or

This presentation will impact the forensic science community by providing valuable insight into variation in developmental thresholds with respect to insect development and its application in calculating the minimum time to colonization.

Black soldier flies, *Hermetia illucens* (L.) (Diptera: Stratiomyidae) are of particular interest for their applications in forensic entomology. Initially thought to be a late colonizer (20-30 d postmortem) of carrion, recent evidence indicates they will colonize a corpse within the first week after death. Black soldier flies are native to warmer environments, including North and South America, and therefore studies on black soldier fly development have primarily focused on determining the higher temperature thresholds and optimal temperatures for development. This study determined the lower temperature thresholds for egg and adult eclosion. Preliminary studies indicate temperatures facilitating successful egg eclosion do not necessarily result in larval development and adult eclosion. For that reason, the black soldier fly has two different lower developmental thresholds; one supporting egg hatch, and one supporting egg hatch and larval development to the adult stage. In relation to the postmortem interval, not differentiating these two temperature thresholds could result in errors in calculating larval age and retrospectively, time of colonization. Black soldier fly eggs were collected in corrugated cardboard clutches from an established colony outdoors, at the Texas A&M University's F.L.I.E.S. facility in College Station, Texas and placed in three growth chambers, each maintaining a 70% RH, 14:10 [L:D] photoperiod respectively. Each growth chamber was set at 12°C, 15°C or 18°C. Egg clutches were randomly assigned to each treatment. Percent hatch and survivorship to the adult stage were recorded. Larvae were provided bovine liver *ad libitum* and allowed to develop without disturbance. Egg eclosion, length of development, and adult eclosion was recorded daily.

**Black Soldier Fly, Lower Developmental Threshold, Forensic Entomology**