G55 Effects of Fluctuating Temperature and Larval Density on *Calliphora dubia* (Diptera: Calliphoridae) Implications for Postmortem Interval Estimation

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After attending this presentation, attendees will be briefed on this part of a series of research papers, which revisits fly life histories and examines them in the environment lived in, rather than the constancy of the laboratory. Entomologists involved in case-work need to understand developmental rates of insects.

This presentation will impact the forensic community and/or humanity by reminding forensic entomologists to be careful in their assessment of fly life histories and their application in case work.

The accuracy of any entomological estimation of postmortem interval (PMI) depends on the thermal history of the larval samples investigated and the availability of comparative developmental reference data. At present, there is a paucity of data relating to larval development under geographicspecific climatic conditions and the influence of micro-environmental temperature produced by larval aggregations on development.

Most entomological PMI estimates are based on reference data compiled from larvae reared at constant temperatures. These estimations have the potential to be erroneous where ambient temperatures at the crime scene fluctuate over time, or where larval aggregations are present on the cadaver during development. High larval density can alter the temperature of the microenvironment experienced by the larvae above that of the ambient temperature used in the PMI estimation.

In this study, the rate of larval development of the forensically significant blowfly, *C. dubia,* was investigated under both constant and fluctuating temperature regimes. Temperatures investigated approximated the summer (24ºC; 19/30ºC) and autumn (19ºC; 13/25ºC) seasonal temperatures of southern Western Australia. The influence of larval aggregation on the development rate of *C. dubia* was also investigated using larval densities of between 50 and 5000 larvae. This presentation will discuss the influence of larval aggregation size and fluctuating temperatures on the development rate of *C. dubia* and the implications of this for PMI estimation

Development, Flies, PMI

 ** Presenting Author*