

Differentiating Third Instar Larvae of Three Species of Flies (Family: Sarcophagidae) of Potential Forensic Importance in Jamaica, Using Morphological Characteristics

Authors : Rochelle Daley, Eric Garraway, Catherine Murphy

Abstract : Crime is a major problem in Jamaica as well as the high number of unsolved violent crimes. The introduction of forensic entomology in criminal investigations has the potential to decrease the number of unsolved violent crimes through the estimation of PMI (post-mortem interval) or time since death. Though it has great potential, forensic entomology requires data from insects specific to a geographical location to be credibly applied in legal investigations. It is a relatively new area of study in the Caribbean, with multiple pioneer research opportunities. Of critical importance in forensic entomology is the ability to identify the species of interest. Larvae are commonly collected at crime scenes and a means of rapid identification is crucial. Moreover, a low-cost method is critical in countries with limited budget available for crime fighting. Sarcophagids are one of the most important colonisers of a carcass however, they are difficult to distinguish using morphology due to their similarities, however, there is a lack of research on the larvae of this family. This research contributes to that, having identified the larvae of three species from the family Sarcophagidae: *Peckia nicasia*, *Peckia chrysostoma* and *Blaesoxipha plinthopyga*; important agents in flesh decomposition. Adults of Sarcophidae are also difficult to differentiate, often requiring study of the genitalia; the use of larvae in species identification is important in such cases. Adult Sarcophagids were attracted using bottle traps baited with pig liver. These adults larviposited and the larvae were collected and colonised (generation 2 and 3) reared at room temperature for morphological work (n=50). The posterior ends of the larvae from segments 9 or 10 were removed and mounted posterior end upwards to allow study using a light microscope at magnification X200 (posterior cavity and intersegmental spine bands) and X640 (anterior and posterior spiracle). The remaining sections of the larvae were cleared in 10 % KOH and the cephalopharyngeal skeleton dissected out and measured at different points. The cephalopharyngeal skeletons show observable differences in the shapes and sizes of the mouth hooks as well as the length of the ventral cornua. The most notable difference between species is in the general shape of the anal segments and the shape of the posterior spiracles. Intersegmental spine bands of these larvae become less pigmented and visible as the larvae change instars. Spine bands along with anterior spiracle are not recommended as features for species distinction. Larvae can potentially be used to distinguish Sarcophagids to the level of species, with observable differences in the anal segments and the cephalopharyngeal skeletons. However, this method of identification should be tested by comparing these morphological features with other Jamaican Sarcophagids to further support this conclusion.

Keywords : 3rd instar larval morphology, forensic entomology, Jamaica, Sarcophagidae

Conference Title : ICE 2019 : International Conference on Entomology

Conference Location : Paris, France

Conference Dates : October 29-30, 2019