



Pathology & Biology Section – 2005

G36 Seasonal Distribution and Abundance of Forensically Important Flies in Santa Clara County

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The goal of this presentation is to identify any seasonal or geographical patterns among forensically important flies within the county that may be important to future investigations using a simple and cost-effective method.

Entomologists working with local law enforcement often encounter gaps in the collective entomological knowledge due to local variation within and among important fly species. This presentation will impact the forensic community and/or humanity by attempting to help close such a gap within Santa Clara County, California.

Forensic entomology has become relatively common in criminal investigations. As insects become more common as indicators of postmortem interval, gaps in information at the local level become apparent. While flies as forensic indicators are well studied, they exhibit great variation in both successional patterns and seasonal abundance due to microclimates. It is this variation that causes the forensic entomologist the most difficulty. The entomologist must adapt data from studies that have taken place miles away or create new, tailored studies to gather data specific to the current case. While the second option is ideal, time and monetary constraints can make it impossible, leaving the scientist to glean what general information is available in the literature. This does yield acceptable postmortem interval estimation, but accuracy suffers. These issues were brought to the forefront in the bay area by two cases in which general data had to be used due to a lack of local studies. The cases were completed successfully, but the entomologists on the cases identified several glaring gaps in the entomological data specific to Santa Clara County, California. The existence of these cases led to a two-year study of seasonal distribution and abundance of forensically important flies in Santa Clara County, designed to identify and quantify any patterns of fly succession that may be useful in future investigations.

Local homicide investigators were consulted, and three areas within the county were identified as the most common dump sites for human remains: urban areas (specifically within the city of San Jose, California), mountainous areas, and along rivers or streams. Four traps baited with beef liver were placed in each of these areas, one mile apart, and checked for flies once a week for two years beginning in 2001. The liver was changed as needed, and temperature data was collected for all corresponding days from the local airport. The insects collected were then pinned and stored for identification. The resulting collection consisted of over 16,000 flies and 3,000 beetles representing several families. In order to expedite the identification process, only flies belonging to the family *Calliphoridae* were identified, although any other insects were preserved in San Jose State's Entomology Museum for future reference and study. The identification process lasted one year, and the results were entered into a database where seasonal and geographical patterns were easily recognized. The results supported the findings in the two cases that prompted the study, while giving additional insight into current investigations within the county.

Entomology, Calliphoridae, Succession