



G21 Antemortem and Postmortem Colonization Interval by Insects: A Case Report

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After attending this presentation, attendees will understand the importance of the discrimination between antemortem and postmortem insect colonization on a corpse, in order to correctly estimate the time since death.

This presentation will impact the forensic science community by demonstrating that with a complete investigation in a case, it is possible to obtain a complete set of data concerning both the antemortem and postmortem period; moreover, it underlines the efficacy of the diverse knowledge required of a forensic entomologist in understanding the insect colonization of a corpse.

The use of insects and other arthropods in forensic investigations (medicolegal entomology) is considered a gold standard for the estimation of the time since death. However, another important branch of medicolegal entomology is the analyses of dipterous feeding on a host's necrotic or living tissues (myiasis) to determine if the insect colonization can be considered in a forensic context (e.g., neglect of elderly). In some particular cases, a myiasis event can happen within a certain period prior to death, such as the colonization of a bloody lesion, bedsores, or the necrotic tissue of a living person who generally is unable to look after themselves. In such cases, the discrimination between a myiasis colonization and a postmortem colonization based on the insects present on a corpse (species, instar, colonization interval) may provide the time since death (Postmortem Colonization Interval, PMCI) and the time of colonization before death (Antemortem Colonization Interval, AMCI).

In June 2007, the corpse of an 82-year-old woman was found on the floor of her apartment in Turin, located in northwest Italy. The neighbors were alarmed by an odor emanating from her apartment, and when the medicolegal and entomologist arrived, the corpse appeared to be in a fresh stage of decomposition. Rigor mortis was still evident and only blow fly egg clusters were observed on the woman's eyes. In contrast to this, her left foot was largely decomposed and a large number of third instar maggots were present.

No domestic animals that may have fed on the body were found in the apartment, but many diabetic drugs and medication were present. In particular, a medical prescription concerning the treatment of a diabetic sore on the left foot and a medical certification of the woman's senile dementia were found.

Insects present on the corpse were sampled at the scene and during the autopsy with particular attention not to mix the samples from eyes and foot. Part of each sample was immediately fixed and the remainder was reared in a growth chamber until the adults eclosed. A temperature data-logger was placed in the apartment for seven days after the corpse was taken to the mortuary, and the apartment temperature was compared with the temperature data over the same period recorded by the meteorological station closest to the apartment. This procedure allowed extrapolation of the temperature of the scene in the period prior to the corpse being discovered.

The entomological analyses determined the presence of *Lucilia sericata* (Meigen) (Diptera: Calliphoridae) eggs on the eyes, and *L. sericata* and *Sarcophaga* sp. (Diptera: Sarcophagidae) third instar on the diabetic wound. These species are typical myiasis insects and they are common in the urban environment of northwest Italy during this period of the year.

The correlation between the entomological data and the temperature information, together with the anatomopathological examination, determined that the woman died the day before the corpse was discovered. The PMCI was obtained using the age of the egg cluster on the eyes, the decomposition stage, and the rigor mortis. The diabetic wound on the foot was colonized four to five days before the death. AMCI was obtained using the age of the insects feeding on the lesion. In all likelihood, due to the senile dementia of the woman, she failed to administer her diabetic drugs some days which placed her in a diabetic coma. It would seem that, during the four to five days of coma, insects colonized the wound on her foot, and only after death were her eyes colonized. This case underlines the importance of the diverse knowledge required of a forensic entomologist and understanding insect colonization of a corpse.

Blow Fly, Myiasis, PMI