



## Pathology Biology Section – 2006

### G51 Insects of the Grave: A Cold Case History Involving Insects 27 Years After Death

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After attending the presentation, attendees will understand the biology of a relatively small group of insects (Collembola) rarely mentioned as an insect frequenting decomposing remains, especially following exhumation 27 years after death. They also will be exposed to the environmental factors that may have led to this occurrence.

This presentation will impact the forensic community and/or humanity by presenting case that provides important information to entomologists and biologists on the biology of Collembolan as it relates to human decomposition. The case also will add to the biological information of this insect group as to their movement in the soil and apparent niche at this soil depth. This is information that will rarely ever be collected in normal crime scene investigations, and it is a rare occurrence in nature to find insects inhabiting a cadaver 27 years after death.

This presentation will make forensic entomologists and other biologists aware of insects and other arthropods associated with decomposing bodies far beyond the normal postmortem interval. It also will make forensic pathologists aware of what types of arthropods may be encountered during investigations when bodies have been exhumed after several years.

The cadaver of a 28-year-old female was exhumed in January 2005 from a cemetery in Battle Creek, Michigan. She had sustained a gunshot wound to the head and was found dead in her home on November 15, 1977. An autopsy was performed and the manner of death was termed as a homicide. The body of the victim was subsequently embalmed and then buried at a depth of 6 feet in an unsealed casket that was placed inside an unsealed cement vault. Information leading to the perpetrator of the crime became known in 2004 and the investigating agency was unable to locate an autopsy report. Therefore, law enforcement officials requested the body be exhumed and a second examination be performed.

The current exhumation yielded thousands of live specimens of a single species of Collembola or spring tails, *Sinella (Coecobrya) tenebricosa*. This species is considered to be a "tramp" species, cosmopolitan in the United States and Canada. It is usually collected in protected areas such as caves, wood piles, and greenhouses. Based on their occurrence in soils, small size, and given the damp conditions present in the casket, this species probably made use of soil pores and tunnels made by worms and other burrowing arthropods in searching for food. Over time, some individuals moved down further into the soil into the moist vault and eventually the casket where cadaver tissues and clothing provided a suitable substrate for fungal/yeast/mold growth as a food source. At this site the species had ideal conditions and the population exploded. Collected with the Collembola were large numbers of Acarina (mites) of the Family Glycyphagidae, and phorid fly puparia, known as coffin flies.

**Insects, Burial, Collembola**