



## Pathology/Biology Section - 2016

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### H14 Study on Forensically Important Insects Collected From Medicolegal Autopsies in South Korea

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After attending this presentation, attendees will better understand the significance of forensically important insects related with human cadavers and the experimental methodology of other countries.

This presentation will impact the forensic science community by reporting on forensically important insects related with human cadavers in the East Asian temperate zone for the first time.

Forensic entomology is a branch of forensic science which applies insect evidence to legal problems mainly for the estimation of minimum Postmortem Interval (PMI-min). Knowledge of the necrophilous insect fauna of each geographic region is very important for the acceptability and credibility of insect evidence for forensic application. In South Korea, most research carried out during the past 20 years was confined to insect fauna attracted to animal carrion or DNA-based identification of necrophilous fly species; however, forensically important information about insects attracted to human cadavers in South Korea as well as the East Asian temperate climate zone is still unsatisfactory.

In the years 2010, 2011, 2013, and 2014, 1,602 insects were collected from 48 medicolegal autopsies in northeastern Seoul, South Korea, and its suburb. Insect infestation of human cadavers was most common in the summer and was not observed at all in January and February. After the families of maggots were identified by the shape of the posterior spiracles, DNA barcoding using nucleotide sequences of mitochondrial Cytochrome c Oxidase subunit I gene (COI) was performed for species identification. The adult individuals were identified to the species level by external morphological characters. As a result, 4 orders, 15 families, 23 genera, and 39 species were confirmed. The four orders identified were Diptera (6 families, 17 species), Coleoptera (6 families, 19 species), Hymenoptera (2 families, 2 species), and Dictyoptera (1 family, 1 species).

The dominant species in this study, *Lucilia sericata* (Order: Diptera; Family: Calliphoridae), showed a strong preference for indoor environments. Sarcophagidae species only occurred during the summer. The occurrence of *Piophilidae casei* (Family: Piophilidae), a potential indicator of an advanced stage of decay, was the first official identification of this species in South Korea. Another Piophilidae species, *Parapiophilidae vulgaris*, coexisted with *P. casei* in one case. Coleoptera species appeared entirely in the summer except for an individual *Dermestes haemorrhoidalis* (Family: Dermestidae) found in a greenhouse in December. The dominant beetle species in this study was *Dermestes maculatus* (Order: Coleoptera; Family: Dermestidae). Silphidae species were observed four times exclusively in the forest cases. Only 13 individuals were collected for families Histeridae, Staphylinidae, and Cleridae known to feed on maggots.

Because the sample size of this study was limited, more extensive sampling is required to characterize the forensically important beetle fauna in South Korea. Despite its limited scale, this study provides a snapshot of the general entomofauna attracted to human cadavers in this region. A more wide-scale survey for the entire Seoul metropolitan area and its suburb is ongoing from 2015.

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#### Forensic Entomology, Autopsy, Entomofauna