

Forensic Acarology: A New Area for Forensic Investigation

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Forensic science is the application of different areas of science to criminal investigation, to provide clues which may solve complicated cases of murder or death. Insects and small arthropods are frequently the first organisms to arrive at a dead body. By their activities they begin a biological clock that will allow for an estimation of the postmortem interval (PMI), the time that has elapsed since death (Goff, 1993).

The application of acarines in the area of forensic entomology has received much interest in the last few years as acarines have been occasionally figured in the area of forensic science emphasizing several associated species with carcasses (Rasmy, 2005). Leclercq and Verstraeten (1989) have provided data concerning the occurrence of Acari on decomposing remains, and Goff (1991) documented the application of acarological data of the estimation of the PMI for a buried corpse on the island of Oahu. Blowflies may arrive to a corpse within few hours of death and bring their own specific mite species. The phoretic mite species attached to them and other insects will start a succession of acarines (Perotti, 2006).

Later on, Avila and Goff (1998) reported that mites of families Acaridae, Anoetidae, Ascidae, Camerobiidae, Digamasellidae, Ereyneidae, Eviphididae, Macrochelidae, Parasitidae, Pygme-phoridae, Tarsonemidae, Terpenacaridae and Uropodidae were noted associated with pig carcasses in the Hawaiian Island.

Moreover, many taxa of mites have independently invaded standing and running water including groups of Gamasida, Acaridida, Oribatida and Actinedida. Aquatic mites are principally predators, but also include detritivores and microbivores. The characteristics of aquatic mites that may make them useful as forensic tools in determination of time of submersion of a corpse have been discussed by Proctor (2006).

It is worth noting that there are three main areas where acarines can be of use for forensic science:

- 1- Estimation of postmortem intervals.
- 2- Scenes of crimes, as acarines are geographically distributed and this knowledge may serve to provide valuable supporting data to determine the location of the body.
- 3- Detection of drugs or toxins in remains through analysis of arthropods, e.g. insects and acarines.

However, additional investigation concerning the effect of decomposing remains of succession patterns on biology of acarines and further studies on their relationship to the decomposition process might be of benefit to the forensic process in the future. As research in these areas is completed, we can anticipate that estimates of postmortem intervals based on acarological and entomological data will become more accurate and widely accepted. Additionally, such knowledge narrows the area of possible suspects in the crimes and reveals that these small arthropods can provide vital clues about murders and causes of death.

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