

Smell of Death and Insects/Mites

Aly H. Rasmy

National Research Centre, Dokki, Cairo, Egypt
e-Mail: aly_rasmy@hotmail.com

Forensic entomology is engaged in providing data of how insects consume decomposing human remains to uncover clues concerning domestic and international terrorism, war crimes, torture, genocide and drug trafficking.

In this view, once death takes place different insect and mite species of forensic importance are attracted to the dead bodies often in outdoor death cases. Surprisingly, blowflies can be attracted over long distances following the smell of death emanating from the deceased and seek out the corpse to lay eggs (Braack, 1981 and Cruze, 2006). This smell is resulting from autolysis process of a body within short time of death. Autolysis is the first stage of corpse decomposition through which the cells of the body are digested by enzymes. It is assumed that bodies buried one foot or less could be colonized by fly larvae as well as uropodid and acarid mites (Payne *et al.*, 1968). The coffin flies burrow into the soil to oviposit directly on the remains, while flesh flies have observed to deposit larvae onto carcasses or on the soil surface above buried remains. These newly deposited larvae can reach the remains through several inches of soil (cited from Walsh-Honey *et al.*, 1999).

It is worth noting that insect and mite succession on corpse are influenced by environmental conditions such as rural or urban habitat, sunlight, shade and seasonal differences (Hobisckak *et al.*, 2002 and Dillon, 1997). Also, presence or absence of clothing affects insect succession on the corpse. As clothing becomes saturated with decompositional fluids, flies reproduction increases and consequently faster decomposition occurs compared to unclothed carcass (Kelly *et al.*, 2008).

Therefore, insects and spiders can provide answers to what happened to a body in the grave and when, where and how someone was murdered, even what actions took place during detention or sever questioning (Rasmy, 2012).

Herein, it is very interesting to note that insects at a crime scene transport blood shed to new locations and can alter bloodstain pattern that might mislead investigators (Parker *et al.*, 2010). The understanding of the mechanics of insects feeding on bloodstain pattern to distinguish between bloodstain pattern caused by violence in contrast to artifacts originated from transmission and digestion of the flies present at the scene. In this regards, the role of mites in bloodstain pattern is not reported yet. This could be due to that mites are easily missed by untrained eyes due to their minute size.

In this concept, the scope of forensic entomology goes further than estimating the time of death and how long the deceased has been laying in a location. So, if a woman is sexually assaulted prior to death, DNA of gut contents of maggots taken from the vaginal area can reveal if a sexual assault has taken place, as the seminal DNA of the perpetrator can be passed to fly maggots via feeding (Cruz, 2006).

Case Study

DNA analysis of gut content of an engorged mosquito female trapped inside a car where the driver was found dead, in Finland, revealed that the DNA was similar to that of one of the suspects who was accused as the murder (Rasmy, 2010).

As well as, a Korean aircraft was shot down in 1983 by a Soviet air to air missile after it had strayed into Soviet airspace. Chemical analysis of maggots collected from victims tested positive to TNT which revealed that the crash is not due to mechanical failure (Cruz, 2006).

In closing, it is possible to overstate that CIA, the Central Intelligence Agency; FBI, the Federal Bureau of Investigation and ICC, the International Criminal Court can realize great information from forensic entomology to solve scenarios in the hopes of improving criminal justice without bias or prejudice.

REFERENCES

- Braack, L.E.O. 1981. Visitation patterns of principle species of the insect complex at carcasses in the Kruger National Park. *Koedoe*, 24: 33-49.
- Cruz, A.M. 2006. Crime scene intelligence: An experiment in forensic entomology. The National Defence Intelligence College Press, 73 pp.
- Dillon, L.C. 1997. Insect succession on carrion in three biogeoclimatic zones in British Columbia. M. Sc. Thesis, Dept. of Biological Sciences, Simon Fraser Univ., Burnaby, British Columbia.
- Hobischak, N.R. and Anderson, G.S. 2002. Time of submergence using aquatic invertebrate succession and decomposition changes. *J. Forensic Science*, 47, 1: 142-151.
- Kelly, J.A.; van der Linde, T.C. and Anderson, J.S. 2008. The influence of clothing and wrapping on carcass decomposition and arthropod succession: A winter study in Central Africa. *Canadian Society of Forensic Science Journal*, 41(3): 135-147.
- Payne, J.A.; King, E.W. and Bienhart, G. 1968. Arthropod succession and decomposition of buried pigs. *Nature*, 219: 1180-1181.
- Parker, M.A.; Benecke, M.; Byrde, J.H.; Hawkes, R. and Brown, R. 2010. Entomological alteration of bloodstain evidence. In *Forensic Entomology: The utility of arthropods in legal investigations*, 539-580. Eds. J.H. Byrd and J.L. Castner, CRC Press, 580.
- Rasmy, A.H. 2010. Perception and status of medicocriminal acarology/entomology. *Acarines*, 4: 1-2.
- Rasmy, A.H. 2012. Insects and spiders as indicators for war crimes and torture. *Acarines*, 6: 1-2.
- Walsh-Honey, H.; Katzmarzyk, C. and Falsetti, A. 1999. Identification of human skeletal remains: Was he a he or was he a she? In: S. Feirgrieve, Ed. *Forensic osteological analysis: a book of case studies*. Springfield, IL: Charles C. Thomass Press, 17-35.