Insect and Mite Succession on Carrion as Affected by Environmental Conditions

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Insects and mites are closely associated with human and their habitat. But after death, different species of forensic importance are attracted to human carcasses within few hours of death, whilst blow flies are diurnal species and usually rest at night. Therefore, a corpse deposited at night may not attracted flies until the following day (Anderson, 2010).

Surprisingly, blow flies can be attracted over great distance by the smell of death emanating from the corpse as the body decomposes. In South Africa, marked flies of genus *Chrysomya* were caught by baited traps up to 63 Km from the place of release (Braack, 1981).

As well as, although mites are easily missed by untrained eyes, but they arrive the corpse carried by air or as phoretic on insects (Rasmy, 2007; 2010 and Perotti & Braig, 2010). Therefore, forensic acarology has not yet been extensively studied compared with forensic entomology as further forensic investigations are required to ensure the role of acarines in carrion decomposition.

It is noteworthy, that each of the five successive decomposition stages of the corpse, started by fresh stage and ended by skeletal stage, is attractive to particular species of forensic arthropods (Goff, 1993). This arthropods succession plays a considerable role to determine the reliably time of death. In recent forensic investigations, the utility of arthropods evidence in other legal investigations to gather information about a crime scene in which the victim could be alive or dead, e.g., rape, physical abuse, drugging, torture and relocation of decomposing remains is reported (Hall, 1990; Gennard, 2007 and Rasmy, 2012).

However, insects and mites succession on corpses and time required to the species involved to reach the corpse are strongly influenced by different local environmental factors, e.g., geographic region, soil type, different habitats and seasons (Anderson, 2010).

Habitats

Genard (2007) reported that the relationship between species and habitats provides a source of further information. There will be variation in the species which colonize a body in different habitats, e.g., upland grasslands compared to meadows, bodies which are hanging supported a lesser diversity of arthropod species and lower overall numbers compared to those lay on or under the ground (Shalaby *et al.*, 2002 and Anderson, 2010).

Interestingly, Catts & Haskell (1990) and Erzineliouglu (1989) reported that certain species of blow flies found on corpses may be used to indicate that the decomposing remains have been moved from an urban to a rural habitat or vice versa, yet other species are not very specific to one or the other and are noted on both sites.

Succession on buried corpse

The diversity of fauna colonizing buried corpses is smaller than for those colonizing corpses above ground and the sequence of arthropods colonization will be affected (Payne *et al.*, 1968; VanLaerhoven & Anderson, 1999 and Anderson, 2010). It is assumed that bodies buried one foot or less will be colonized by dipterous larvae. Therefore, bodies buried at a crime scens may be revealed by the presence of coffin flies. Their presence on the soil surface could indicate the location of a buried body.

Sunlight

Interestingly, Hobischak *et al.* (2005) reported that mite and insect species abundance on carcasses placed in sunlight were dramatically affected compared with those placed in shade. This is related to that corpses exposed to sunlight will be decomposed faster than shaded carcasses and consequently maggots increase positively correlated with sunlight temperature (Dillon, 1977 and Dillon & Anderson, 1955), whistle other fly species were noted in both sun and shady habitats (Holdaway, 1930).

Season

Insect trapping reflected the distinct seasonal differences in blow fly composition as the most common species collected in winter were different than those noted in summer and fall (Kelly, *et al.*, 2008). As well, season has a considerable effect on the flora and arthropods of a region.

Eventually, further investigations are still required to study the effect of the aforementioned parameters under differential conditions to ensure more accurate investigations to convince local authorities with using arthropods in criminal investigation.

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