Estimation of post mortem intervals in humans - a macroscopic application of developmental biology called «Forensic Entomology»

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Insect development is well-studied and thus can be used as a marker for estimation of time intervals. Blowflies and several beetles together with their larvae are used in forensic science to help diagnosing how long a corpse has been exposed to defined environmental conditions. Most times the forensic entomologist is asked if the insect fauna of an corpse can tell the time and date of a person´s dead.

For various reasons, pest control experts as well as entomologists and (forensic) medicinal practitioners have studied the correlations between temperature, humidity and speed of development of several insects. Forensic scientists put together those facts and calculated curves which now allow a precise estimation of the living time of an insect found associated to a corpse. In most cases, length, weight, and macroscopic state (e.g., filling of intestines) of larvae are determined and compared to the standard data curve.

Because of several insects visiting corpses only at a defined state of decomposition, further information about the post mortem interval is given by determination of species. Sometimes it is quite hard to determine species just by their pupae or even worse by their larvae. That is why it can be necessary to breed larvae to adultship. In doing this, developmental biology once again is in focus of research and criminal investigations.

Only a few laboratories in the world (Rosny sous Bois, Hawaii, Wien, Köln, Quantico among few others) perform(ed) studies concerning the forensic application of insect development. We present our aims to establish a database of developmental processes of insects which are specific for the western German fauna of human corpses, especially for the diptera *Lucilia caesar, Calliphora vicina* and *Calliphora erythrocephala.*