

# Insects and corpses

**Mark Benecke**

International Forensic Research & Consulting, Postfach 250411, 50520 Cologne, Germany, forensic@benecke.com, <http://www.benecke.com/>

## Summary

(I) Brief overview over early forensic entomology cases, their main misconceptions, and what we might learn from them. This touches the very modern question of what makes a person a good expert witness, compared to a bad one. (II) Perception of animals related to real, observed decompositions vs. animals of symbolic meaning. Here, we try to differentiate between snakes and maggots in medieval pictures (Dances Of The Dead), as well as mentioning toads and moth. We also show an example where a renaissance artist substituted the heart of a decomposed body (ivory skeleton, „Tödlein“) by a blow fly. (III) Five new unusual cases that we encountered during our forensic entomology co-operations with several police departments in Germany: (1) Mass invasion of spiders and dermestid beetles into flats, (2) blowfly maggots in only one eye socket of a dead person, (3) alleged maggots in a police dish, (4) Credit card fraud and forensic entomology, (5) absence of pupae as an indication that a corpse was moved.

## (I) Historic notes

Insects as inhabitants of corpses were very well observed by artists of former times. Correct descriptions of insect activity, especially the early infestation of a corpse's face, and intestines can be found in many sources, including

- German woodcuts of “Dances of the Death” (Totentänze) from the late 15th century [1]
- a painting named *Les amants trépassés* from the Musée de l'Œvre Notre-Dame (Strasbourg) from ca. 1470 (fig. 1d)
- French poet's Charles Baudelaire's (1827 -- 1876) collection of poems *Les fleurs du mal* (see poem *Une charogne*) (e.g., [2])
- an ivory skeleton from the Schnütgen-Museum for medieval arts in Cologne in which the heart is substituted by a blow fly [5].

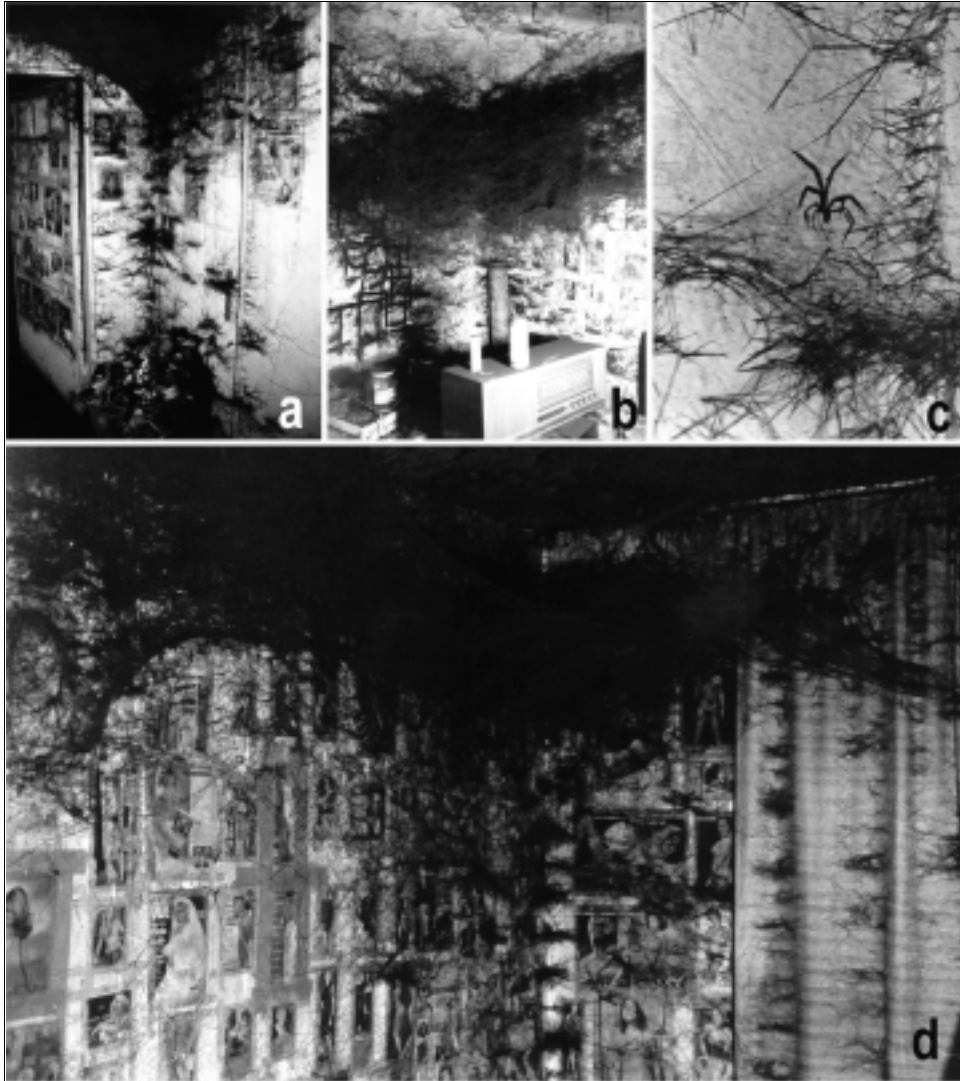
Flies were also the motive for the highest military order in ancient Egypt (fig 1c.)



**Fig. 1:** (a) *La faune des cadavres*, 1894; (b) dermestid beetle skins, and feces of dermestids in the eyes of the dead person (case 1a); (c) ancient Egypt military blow fly order; (d) *Les amants trépassés*, ca. 1470; (e) blow fly maggots in only one eye socket (case 2).

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Estimation of post mortem interval came up in the 19<sup>th</sup> century with a popular science book that included case reports already (fig 1a). The method then spread over Canada and the U.S. back to Europe. A detailed history of the early history of Forensic Entomology is given in [1, 5, 6].



**Fig. 2:** Webs built by spiders cover the complete apartment where a person was still living (see case 1b). Top left: Entrance hall; top middle: living room; top right: shadow of spider in photograph (no actual species were collected by the Fire Department); bottom: detail of living room. All the walls were covered with newspaper/magazine clips behind which the spiders could hide.

**(II) Cases***1) Mass invasion of spiders and dermestid beetles into neighbouring flats*

- 1a) Examination of a nearly skeletonized, dried out corpse in the apartment where the person had been living did show masses of dermestid larva skins but nearly no blowfly larvae, pupae, or adults. Reason: An electrical heater dried out the body very quickly so that blowflies did not find a suitable habitat.
- 1b) In the same house, another (living) person was approached by us. Inside of the flat, hundreds of living spiders, and their spider webs were found. Reason: Person refused to use the toilet, or to clean his rooms -- excrements attracted large numbers of flies -- flies attracted numerous spiders.

*2) Maggots in only one eye socket of a dead person [3]*

The corpse of a 41-year-old medical doctor was found in his bed. The body was partially dried out; parts of the hip region were skeletonized due to maggot activity. In the facial region of the corpse, blowfly maggots (*Lucilia (Phaenicia) sericata* [Meigen]) were found exclusively in one eye socket. This is an unusual occurrence since on that side, a bed-light (40 W light bulb) had been burning during the seven week post mortem interval. All other lights in the apartment were switched off, and no direct sunlight could enter the space where the body was found (only a TV set had been running all the time, ca. 2 m away from the head at the foot end of the bed). Obviously, the maggots who usually flee light had used up the one eye that was further away from the bedlight as a feeding source. Since the continuing mummification of the corpse led to a substantial restriction of feeding material, the maggots finally switched to the eye that the light was shining on.

*3) Maggots in a police dish*

During a joint task force operation against 5000 motorcycle rockers in the federal state Brandenburg, German policemen of another, richer federal state complained for many days about the local food situation. On the last day of the operations, „maggots“ were found in the food. We concluded from photographs that (a) the head parts of the alleged maggots were darkened as in beetle, or butterfly larvae, and (b) the larvae had been dead (stretched shape). These observations made it likely that the food was neither spoilt nor rotten but that somebody had thrown in the insect larvae on purpose [4].

#### 4) *Credit card fraud and forensic entomology*

In November 2000, a decomposed women's corpse was found dead in an apartment in Central Germany. Because the doors were closed, police assumed that the dead person was the tenant. Due to the severity of decay, the post mortem interval (PMI) of the body could not be determined by regular means. On the other hand, determination of PMI was important since a bank card of the woman had been used, possibly after her death. On the crime scene, numerous larvae of the „fly of the dead“ (Toten-Fliege) *Cynomya mortuorum* (Linné; family: Calliphoridae R.-D.), were found.

*C. mortuorum* larvae are known to feed on decomposing animal tissue. In this case, *C. mortuorum* could outcompete other fly species because of the closed rooms/restricted access. Following [7, 8] who found that at 15 to 16.6 °C the developmental time from egg to adult for *C. mortuorum* takes at least 26.2 days (max. 31 days), we gave a similar estimation of PMI. It was therefore possible that the bank card was used after the death of the woman, maybe by an innocent relative.

#### 5) *Absence of pupae as an indication that a corpse was moved*

In a recent investigation, the corpse of a man was found in the trunk of his own car. The body was partially decomposed. Since blood was found on the initial scene of crime, and due to witness's observations, it was expected that the person had been killed several days before in his own car, then stored somewhere, and then was either moved back, or was left all the time in the trunk of the car.

Around one year later, we were asked for an entomological expert opinion. The car was still in police custody, and could therefore be examined. We found that no pupae did enter the gaps between the trunk and the back seats. This was unusual because maggots prefer to pupate in hidden places. Furthermore, the temperature fluctuated heavily at one point so that maggots were expected to hide from the cold, and/or to enter diapause.

Apart from species determination of maggots and pupae that were collected by the police the year before, we delivered the opinion that most likely, the person was colonized by maggots at one point and then stored somewhere until many larvae went into postfeeding, or diapause state. Afterwards, the corpse was moved back into the trunk of the car where only few maggots were left on the corpse. Of those few, none entered the gaps.

This clue became interesting for the police, and the D.A.'s office since now search warrants for suspect's houses could be filed (search for matching pupae).

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Burkhard Madea, University of Bonn, kindly submitted the painting *Les amants trépassés*; Sibylle Banaschak, University of Jena, sent a good colour photograph of the ancient Egyptian blowfly order from the Museum of Kairo; Pekka Nuorteva and Marcel Leclercq sent numerous reprints of their articles. Thank you very much to all of them.

#### Few Selected References Relating to the Cases

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