

Neglect of the elderly: forensic entomology cases and considerations[☆]

Mark Benecke^{a,*}, Eberhard Josephi^b, Ralf Zweihoff^b

^aInternational Forensic Research and Consulting, Postfach 250411, 50520 Cologne, Germany

^bInstitute for Legal Medicine, City of Dortmund, Bünnerhelfstraße 31, 44379 Dortmund, Germany

Available online 13 October 2004

Abstract

Wounds of living persons are a potential target for the same flies that live, or feed early on corpses. This can lead to complications in estimation of PMI but also allows to determine additional information that might be valuable in a trial, or during the investigations [e.g., M. Benecke, R. Lessig, Child neglect and forensic entomology, *Forensic Sci. Int.* 120 (2001) 155–159]. With forensic entomology, and forensic entomologists being more and more present, even lower profile cases like the neglect of elderly people (without violence being used against them; i.e., natural death) comes to our attention. Furthermore, much more people grow older than in the past years which leads to increased awareness of malpractice of caregivers in the professional, and personal environment [DPA (German Press Agency), Studie an 17000 Leichen: Jeder Siebte vor Tod falsch gepflegt (Every seventh elderly person not cared for sufficiently), German Press Agency dpa # 051402, Jan 3, Jan 5, 2003]. We briefly sketch three cases in which forensic entomology helped to better understand the circumstances of death, and the type and intensity of neglect before death.

© 2004 Elsevier Ireland Ltd. All rights reserved.

Keywords: Forensic entomology; Neglect of elderly persons; *Lucilia sericata*; *Muscina stabulans*; Insect infestation of living persons

1. Case 1: Clean apartment with dead *Muscina stabulans*

An elderly woman was found dead in October 2002 in her third floor apartment in urban Cologne, Germany (Fig. 1). The apartment was very clean except of the bath room in which a bath tub had been filled with water and clothing.

Apart from larvae, exclusively dead adult flies of the species *Muscina stabulans* FALLÉN (determination after [10]) were found spread on the floor, and on a window sill pointing towards North–West (the apartment had no windows on the South) (Fig. 2A). No blowflies (in the zoological sense of the meaning) were present in any developmental

stage. However, crawling tracks of larvae could clearly be seen (Fig. 2B).

We decided to base our statement on the fact that all adult flies had already emerged from the pupae. We used the following developmental data [6,7] at a range of reasonably possible room temperatures:

MARCHENKO	19 °C	22, 8 d
	20 °C	21, 0 d
	21 °C	19, 5 d
NUORTEVA	ca. 16 °C	26–28 d

The minimum interval of around 3 weeks would have been a misconduct of the paid professional care giver who was supposed to check for the women every week. The care giver, however, claimed that she had called the women ca. 2 weeks ago to check on her; the now dead women allegedly rejected any visits. This possibility could not be ruled out

[☆] Based on a speech given at the First Meeting of the European Association for Forensic Entomology (EAFE), Frankfurt, 2003.

* Corresponding author. Tel.: +49 173 287 3136; fax: +49 221 660 2641.

E-mail address: forensic@benecke.com (M. Benecke).



Fig. 1. Case 1: Note that the eyes are intact whilst the lower part of the body is partially decayed due to influence of faces and urine/bacteria. Upper part of body mummified (dried out).

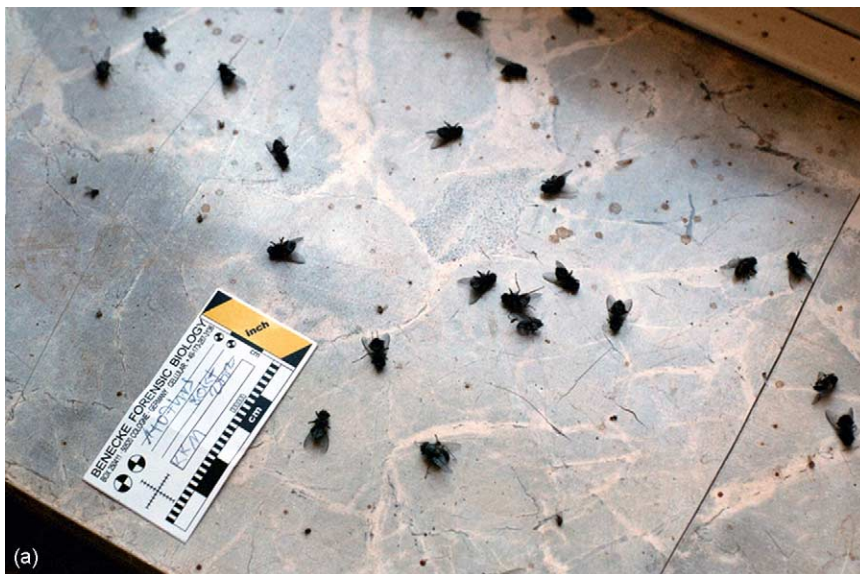


Fig. 2. Case 1: (a) Dead flies on window sill as indicators of neglect (stable fly); (b) Maggot crawling tracks—note the curved shape of tracks indicating that they are not simple tracks caused by oozing decomposition fluids or blood.

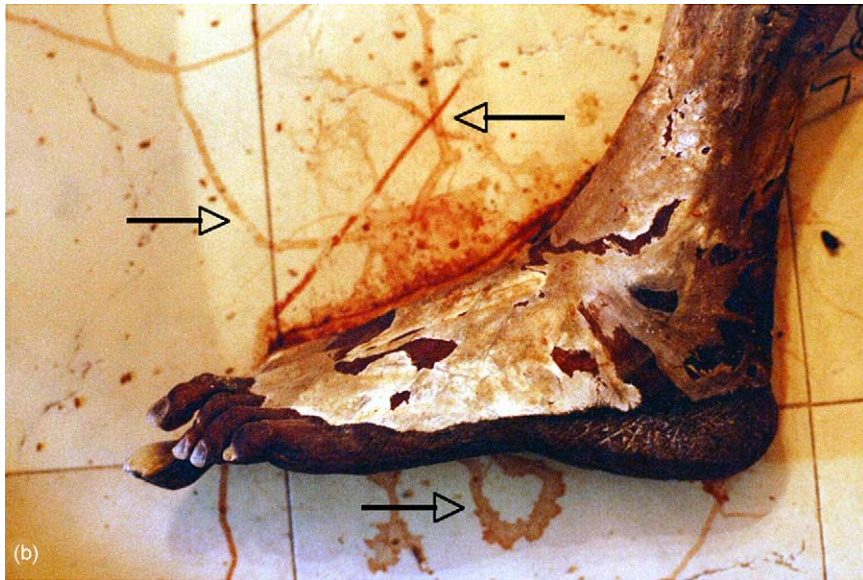


Fig. 2. (Continued).



Fig. 3. Case 2: (a) Regular post mortem state of corpse, no external signs of violence; (b) Influence of maggots on live tissue. Note the shoe lace which was used to close the plastic bag wrapped around the wound; (c) non-functional toilet aided in establishing fly population before wound was present.



Fig. 4. Case 3: Note the matching pressure marks indicating that the head had been resulting on the neck for a prolonged time interval whilst the woman was still alive yet severely neglected by her son.

since the old woman was known to be healthy, yet mentally unstable and behaving “difficult” against everybody.

This case also shows how very important a crime scene visit of the forensic entomologist is: the insects from the window sill would not have been collected by the police since the insects seemed to be not feeding on the corpse (as if they were just “laying around by chance”).

In clear contrast to the entomological findings, the prosecution assumed that the care giver tried her best, and therefore, the D.A.’s office closed the case.

2. Case 2: Deep tissue loss at foot

In September 2002, an old woman was found dead in her apartment in an urbanized town in Western Germany. Her foot was wrapped in a plastic bag (Fig. 3); inside, numerous larvae of *Lucilia sericata* (determination after [10]) were found.

The police explicitly stated the absence of adult flies inside of the flat. However, the apartment was in a bad condition, and even the landlord had noted in January 2002 that renovations were urgently necessary due to wet spots in the walls. He also noted the presence of “small flies”.

The women did not clean her toilet appropriately, and in the washbowl, wet clothing was found. Therefore, a fly population could have been established even without injuries of the woman. To everybody’s surprise, the care giver openly stated that “it is well possible that the foot of the person was wrapped in a plastic bag, and that maggots may have been present inside of the plastic bag during the lifetime of the woman”.

The general practitioner estimated the post-mortem interval as ≥ 2 days.

The age of the maggots was estimated from their size (11 mm) as approximately 4 days (4×24 h) at recorded outside temperatures of 20 °C [5].

However, judging from the deep tissue loss at the foot, it was discussed that most likely, the maggots had been feeding on the living woman for at least a week whilst she was still alive but then left the bag to pupate elsewhere. The apartment could not be checked for pupae, however.

3. Case 3: Dead mother on couch

In March 2002, the corpse of an old woman found in her apartment in an urban apartment in a Western German town (Fig. 4).

The apartment was untidy in non-organic terms but no rotten organic matter was seen. On the actual corpse, the following insects were found: larval *Fannia canicularis* flies, larval *Muscina stabulans* flies, and adult *Dermestes lardarius* beetles. These insects are known to build up populations inside of human housings (e.g. [2,9]) but the presence of *Fannia* frequently hints towards the presence of feces, and urine in cases of neglect [1].

In this case, further evidence for neglect of the living person was found in the fact that the skin of the corpse was not fed on by the larvae, and that pressure spots (arrows in Fig. 4) had formed. The eyes of the corpse were intact. Pupae of an unknown species were reported to us but had not been collected. This led us to the conclusion that the foot was inhabited pre-mortem. If the eggs would have been deposited post-mortem, there should have been at least a minimal presence of eggs, or larvae, in the region of the eyes, ears, or nose since these are—together with wounds—preferred spots for colonization.

The son of the woman was accused of misconduct of taking care of his mother. He claimed that he fed his mother the evening before she died, and that she was well at this point. Referring to the entomological findings, and the pressure spots, his statement was not believed by the judge.

The question if the woman suffered from pain by larvae living on her body could not be answered by us. It is known that blowfly maggots inside of wounds may cause no pain at all, or severe pain [4,8].

4. Conclusion

From the actual case work, we get the impression that misconduct of elderly people currently becomes a severe problem in aging societies. From a juridical standpoint, it is—and will be—very difficult to judge if the care giver is guilty of misconduct, or not. Forensic entomology can give important insights into the dynamics, the amount, and the final state of bodily care that was given to the neglected person.

At the same time, forensic entomology helps to excuse care givers who did actually do their duty whilst maggot infestation of a person's wounds occurred during a normal interval of non-visits.

It needs to be stressed that the forensic entomologist should be present at the scene of crime because the complex interactions with the environment as well as collection of dead animals, and pupae, can be problematic for untrained police personnel.

Acknowledgements

The criminal police forces, and the D.A.'s offices (Staats-Anwaltschaft) of the cities of Hagen, Dortmund, Cologne, and Bonn. I also wish, KHK' in Doro Christmann (case 1), and the departments KK 11 (homicide detective's bureaus) of the PP's (Police HQ's) of Cologne, Dortmund, and Bonn.

References

- [1] M. Benecke, R. Lessig, Child neglect and forensic entomology, *Forensic Sci. Int.* 120 (2001) 155–159.
- [2] M. Benecke, Forensic Entomology: Arthropods on Corpses, in: M. Tsokos (Ed.), *Forensic Path Rev.*, vol. II, Humana Press, Totowa, NJ, in press.
- [3] DPA (German Press Agency), Studie an 17000 Leichen: Jeder Siebte vor Tod falsch gepflegt (Every seventh elderly person not cared for sufficiently), German Press Agency dpa # 051402, Jan 3, Jan 5, 2003.
- [4] W. Fleischmann, M. Grassberger, Erfolgreiche Wundheilung durch Maden-Therapie (Successful wound healing by use of maggots), Thieme & Karl F. Haug Fachbuchverlag, 2002.
- [5] M. Grassberger, C. Reiter, Effect of temperature on *Lucilia sericata* (Diptera: Calliphoridae) development with special reference to the isomegalen- and isomorphen diagram, *Forensic Sci. Int.* 120 (2001) 32–36.
- [6] M.I. Marchenko, Medicolegal relevance of cadaver entomofauna for the determination of the time of death, *Forensic Sci. Int.* 120 (2001) 89–109.
- [7] P. Nuorteva, Age determination of a blood stain in a decaying shirt by entomological means, *Forensic Sci.* 3 (1974) 89–94.
- [8] L. Oesterhelweg, Personal communication (2003).
- [9] H. Schröder, H. Klotzbach, L. Oesterhelweg, K. Püschel, Larder beetles (Coleoptera, Dermestidae) as an accelerating factor for decomposition of a human corpse, *Forensic Sci. Int.* 127 (2002) 231–236.
- [10] K.G.V. Smith, *A Manual of Forensic Entomology*, The Trustees of the British Museum (Natural History), London, 1986.