

Suicide or homicide?

A case report involving textile fibre investigations

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ABSTRACT: A woman was found hanging dead in the garage of her house by her new boyfriend. Crime scene officers did their work on the scene. The hands, the clothing worn by the woman and the rope were taped to collect any adhering fibre material. The medical examiner stated that the case was a suicide. Fibre investigations included primary and secondary transfer processes. The tape lifts taken from the deceased were also searched for conspicuous foreign fibre material. By means of the fibre investigations it could be determined in which way the woman had died.

KEY WORDS: Textile Fibres, Primary and Secondary Transfer, Foreign Fibres,
Suicide, Homicide

INTRODUCTION

Fibre investigations have been carried out in many countries all over the world to provide useful evidence that two persons or a person with an object had been in contact. The use of adhesive tape was first proposed by Frei-Sulzer (1). Primary transfer of textile fibres was investigated by Kidd and Robertson (2). Research results of secondary transfer processes of

fibres were published by Lowrie and Jackson (3). Casework investigations according to the principle of guideline traces were introduced by Neubert-Kirfel (4), the possibilities and limits were pointed out in a case report by Decke (5, 6). The purpose of this article is to demonstrate the potential of textile fibre investigations to solve a real case.

CASE SCENARIO

One November evening a woman was found hanging dead in the garage of her house by her new boyfriend (Fig. 1). Strands of her hairs and an earring were found on the garage floor. Signs indicating a struggle could not be detected. In the past, the deceased had had heavy quarrels with her husband. The couple had lived separately for the last year and a half. The woman wanted a divorce.



Fig. 1: Dead woman hanging in the garage

In the morning of that fatal day the deceased had breakfast with her new friend. They both then left the house in order to drive to work. The car of the deceased was in the garage, about 20 meters away from the entrance of the house, whereas the car of her friend was parked on the street in front of the house.

The time of death was estimated by the medical examiner to be between 5 am and 11 am. Crime scene officers did their work in the garage. The hands of the dead woman were taped to collect any adhering fibre material. The clothing worn by the woman and the rope were taken by the police and taped later. The garage, the apartments of the dead woman, of her mother, of her boyfriend, of her estranged husband and all other places of interest were taped too.

The result of the investigation by the medical examiner was that the case was a suicide. Nothing was found, which could be interpreted as a homicide.

About two weeks later, after the body had been buried, the police asked us to undertake an investigation of fibre evidence.

During our investigations we had to take into account the following facts:

- Information from the police: First, there was no contact between the woman and her husband during the past 1.5 years. Later, police found out that the last contact was probably one day before she died.
- Regular exchange of their dog Arnie
- Both used the staircase in the house (His office was on the 3rd floor)
- Both used the garage of the house.

MATERIALS AND METHODS

Tape lifts were performed using the adhesive tape “Sellotape”. Tape searches were carried out under low magnification using a stereo microscope. Fibres of interest were marked with a felt tip pen and then removed by cutting open a flap of the tape. The fibres were removed with fine tweezers and mounted on glass slides. The following microscopical techniques were used to identify, to characterize and to compare the fibre material: Bright-field microscopy, polarizing microscopy, fluorescence microscopy, UV-VIS spectroscopy and FTIR spectroscopy. Trace fibres which match the comparison material must be identical in material composition, colour, fluorescence, delustrant, diameter and cross-sectional shape.

RESULTS

We had to search for flax fibres on the tapes taken from the hands of the woman and then to compare them to the constituent fibres of the rope (Fig. 1). Altogether we found 4 matching fibres on the tape liftings. Our interpretation of this finding is that these fibres could have been transferred during a suicidal action or during the victim defending herself from attack.

One day after the dead woman was found the estranged husband, the suspect, delivered the clothing (jacket, shirt, trousers) he had worn to the police. In the tape liftings from these garments we found not one single fibre matching the fibre material of the garments worn by the deceased (jacket: brown viscose fibres, T-shirt: blue cotton fibres). Black cotton fibres of the suspect’s clothing could not be searched for on the tape liftings taken from the garments of the dead woman.

The suspect lived 15 km away from the place the dead woman was found. We speculated that he possibly drove by car close to the garage. While driving, fibres originating from the drivers seat could have been transferred to his clothing. These fibres could then have been transferred in a secondary transfer to the victim. Unfortunately the driver seat consisted of uncharacteristic black wool fibres.

In a next attempt we searched the tape liftings taken from the deceased for conspicuous foreign fibre material. During this investigation we found the following interesting foreign fibres:

- Greyish-blue polyester fibres. Particular characteristics are, that they show forms of a bulb and that the ends are often very thin (Fig. 2)
- Grey viscose fibres (Fig. 3).

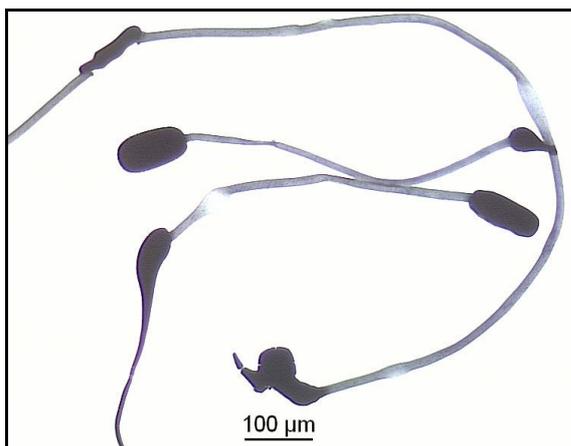


Fig. 2: Greyish-blue polyester fibres on victim's clothes (12-15 µm diameter)

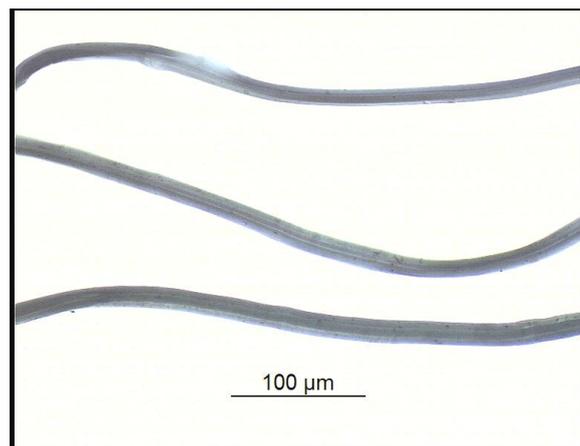


Fig. 3: Grey viscose fibres on victim's clothes (20-22 µm diameter)

The following contamination was found:

Victim:

	Greyish-blue polyester fibres	Grey viscose fibres
Jeans trousers	4000	2000
Jacket	1100	Present
T-shirt	350	Present
Hands	10	6

Garage:

	Greyish-blue polyester fibres	Grey viscose fibres
Bench	25	Present
Walls	150	Present
Floor	80	Present
Rope	32	Present

First investigations concerning the former husband, who was becoming more of a suspect:

Suspect:

	Greyish-blue polyester fibres	Grey viscose fibres
Clothing	300	Present
Car	450	Present
Apartment	150	Present
Office	400	Present
Apartment of girlfriend	40	Present

No matching fibres have been found in the following households:

- Apartment of victim's mother
- Apartment of victim's boyfriend
- Apartment of boyfriend's mother.

70 matching fibres have been found in the car of the victim's daughter, in her apartment and on her clothing.

Investigation in the apartment of the victim:

We had found several thousand foreign fibres (greyish-blue polyester fibres and grey viscose fibres), which did not originate from the clothes worn by the dead woman. We expected to find the donor fabric of these fibres in her apartment.

We took many tape liftings from the floors, bedding, chairs, sofas, cushions etc. of the victim's apartment. In the entire living area of the woman we found only 21 greyish-blue polyester fibres with bulbs and thin ends, 15 of which were on the floor.

CONCLUSION

The conclusion we drew at this stage of the investigation was that the donor of these greyish-blue polyester fibres and the grey viscose fibres were never in the household of the deceased woman. The logical consequence of our considerations must be as follows:

The transfer of the fibres onto the clothing of the dead woman cannot have taken place inside her apartment. Further, this transfer took place after she has left her apartment. There must have been a contact with a garment of an unknown person.

The logical consequence: The case is a homicide and not a suicide.

In our opinion, the greyish-blue polyester fibres and the grey viscose fibres originate from a garment of the offender. We are sure that we can find these fibres in the living area of the offender. This means, that these textile fibres can show us the way to the murderer.

We went back to the apartment of the estranged husband and searched among hundreds of garments for the donor of the fibre traces we have found on the victim. We collected fibres from all garments on tapes. All the tape liftings were microscopically examined in the apartment of the suspect. Finally we found a pair of black trousers whose fibres matched the fibres we had found on the victim. The brand name of the trousers was “s.Oliver”.

The greyish-blue polyester fibres and the grey viscose fibres matched in all aspects the fibres we found on the clothing of the victim (Fig. 4 and 5).

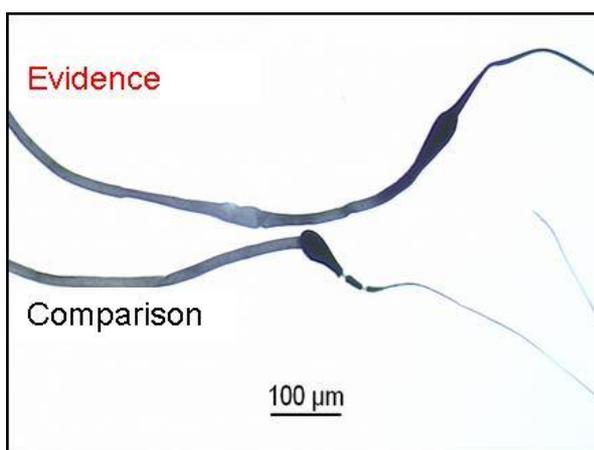


Fig. 4: Greyish-blue polyester fibres

Evidence: from victim's clothes

Comparison: suspect's trousers

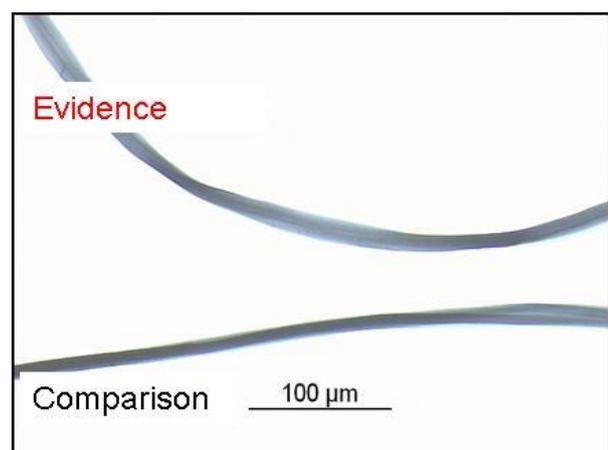


Fig. 5: Grey viscose fibres

Evidence: from victim's clothes

Comparison: suspect's trousers

In additional investigations we found matching fibres on the clothing that the offender had delivered to the police one day after the deceased had been found. This is evidence that the offender was the owner of the s.Oliver-trousers at the time the victim was found.

The evidential value of the greyish-blue polyester fibres is enhanced by the uncommon nature of the fibre ends we had never seen before in such an amount in our daily casework investigations. We suppose that these fibre ends are the result of manufacturing errors.

In our opinion the presence of 21 greyish-blue polyester fibres in the victim's apartment may be explained either by a secondary transfer process by crime scene officers, who worked in the garage but also entered victim's apartment, or by secondary contact via the dog Arnie as we found a small quantity of matching fibres in the dog's beds.

During the judicial hearing the medical examiners changed their minds. They now concluded that their findings could be interpreted in two ways: The case could have been a suicide or a homicide. Based on the findings of the fibre investigations the accused was punished to lifelong imprisonment.

LITERATURE CITATIONS

The case was presented at the EAFS meeting 2006 in Helsinki, Finland and was published in Global Forensic Science Today, 2nd edition, 2007, 16-18. (www.global-forensic-science-today.net).

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