RECOVERY OF FIBRES FROM PARTIALLY BURIED CLOTHING

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ABSTRACT: In many incidents the clothing of the suspect or the victim is recovered from vegetation or has been partially buried and therefore the surfaces of the fabrics are covered in vegetation, mud or sand. This debris hinders the recovery of the fibres. Various methods of fibre recovery were examined to determine if fibres could be recovered from such surfaces and to estimate the efficiency of the recovery methods.

KEY WORDS: Fibres; Fibre recovery; Buried clothing.

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INTRODUCTION

There are many incidents in which clothing has been recovered from heavy vegetation or has been partially buried. Examples might be:

- On the escape route the gloves, mask, or jacket has been pushed into a hedge.
- A struggle has occurred on the ground when the suspect was apprehended and mud, sand or vegetation adheres to the clothing.
- The murder victim is found concealed in vegetation or partially covered with soil.

In these situations the surface of the clothing may be covered in vegetation, mud or sand. This hinders the recovery of the fibres. We carried out experiments to see if it was possible to recover the fibres from these surfaces and to see what would be the most efficient method of recovery. Various methods of fibre recovery were examined. These included taping, brushing and shaking the fabrics.

MATERIALS AND METHODS

Two sets of fabric squares, approximately 15 × 15 cm in size, were used for the experiments: 3 retentive fabrics (e.g. wool) and 3 non-retentive fabrics

(e.g. denim). An average of the number of fibres recovered was obtained using the 3 different fabrics in each set.

One surface of each of the squares was seeded with various lengths (2 –10 mm approximately) of fluorescent red fibres by rubbing the red fabric across the surface. The number of fibres was counted by viewing the surface of the fabric under UV light (360 nm).

The fabrics squares were pinned onto a sheet of cardboard. Pieces of vegetation, wet soil or sand were then placed onto the seeded surface of the fabric squares. A "clean" seeded fabric square was also prepared as a control.

The sand covered fabrics were examined immediately. The vegetation and mud-covered fabrics were left outside for a week after which the fabrics were dried.

FIBRE RECOVERY

Vegetation and soil

- The vegetation and caked pieces of soil were carefully removed from the surface of the fabric squares using forceps or adhesive tape. The underside of this was examined under UV light and any of the fluorescent red fibres were removed using forceps. The surface of the fabric was then taped 10 times until the background fibres were easily removed. The tapelifts were viewed under the UV light and the number of fibres noted.
- The vegetation and caked pieces of soil were removed as above. The surface of the fabric was taped once to remove any loose soil or vegetation. The tapelifts were examined under UV light. The fabric surface was then brushed using a toothbrush. The bristles of the brush and the fabric surface were examined under UV light and any remaining fibres noted.

Sand

- The sand was gently shaken from the fabric. The fabric surface was then taped 10 times. The debris and tapelifts were viewed under the UV light and the number of fibres noted.
- The sand was shaken gently from the fabric. The fabric surface was then brushed using a toothbrush. The bristles of the brush, the debris and the fabric surface were then examined under UV light and any fibres noted.

DISCUSSION

The bulk of the vegetation and soil was removed from the surface of the fabric squares either using forceps or adhesive tape. This debris was examined and less than 7% of the seeded fibres were recovered from the underside of the debris (Table I).

TABLE I. RECOVERY OF FIBRES FROM VEGETATION COVERED SURFACE

	recovery of fibres [%]
Vegetation	6
Tape no. 1	59
Tape no. 2	12
Tape no. 3–6	0
Total recovery [%]	77

After the larger pieces of debris were removed the fabric squares were taped. Multiple tapings were used i.e. until the background fibres from the fabric were easily removed. In the vegetation covered fabrics on average between 3 and 5 tapelifts were required to remove the majority of the seeded fibres. Similar results were obtained for the soil covered fabrics however this was dependent on the quantity of soil present (Table II) as can be seen in the variation of % recovery within each set of fabrics. With this method 40–100% recovery of the seeded fibres was achieved (see Table III). In the more heavily soiled fabrics up to 8 tapelifts or more were required.

TABLE II. RECOVERY OF SEEDED FIBRES FROM LIGHTLY SOILED FABRIC BY TAPING THE FABRIC SURFACE [%]

	Fabric, poor retention	Fabric, good retention
Fabric 1	69	94
Fabric 2	100	87
Fabric 3	48	38
Average [%] recovery	72	73

TABLE III. RECOVERY OF SEEDED FIBRES OBTAINED BY TAPING THE FABRIC SURFACE

Tape no.	recovery of fibres on each successive tapelift [%]			
	Vegetation	Heavy soiling	Light soiling	Sand
1	27. 5	26	63	39
2	14	11.5	34	26
3	12	14.5	3	13
4	2	14.5	–	–
5	4	17	–	–
6	–	14. 5	–	–
Total recovery [%]	59.5	98	100	78

In the brushing method again the larger pieces of debris were removed from the surface of the fabrics. A toothbrush was then used to brush the surface of the fabric. This did not appear to be an efficient method of recovery as the fibres were difficult to locate in the debris. It was found that the fibres were caught in the bristles of the toothbrush. Also fibres still remained on the surface of the fabric (Table IV), and were removed by a further taping of the fabric surface.

TABLE IV. RECOVERY OF FIBRES BY BRUSHING THE FABRIC SURFACES

	Recovery of fibres [%]		
	Vegetation	Light soiling	Heavy soiling
Bulk debris	23	19	15
Bristles of brush	19	19	25
Remaining on fabric	5	19	15
Total recovery [%]	47	57	55

Gentle shaking of the fabric removed the loose sand, soil or vegetation. However fibres were also removed and were difficult to locate in the quantity of debris removed.

CONCLUSIONS

Fibres can be recovered from the clothing if it's covered with vegetation, sand or soil. The bulk of the debris should first be gently removed and the surface of the debris, that was in contact with the fabric, examined for fibres.

There was variation of % recovery of the seeded fibres within each set of fabrics however this did not appear to be fabric dependent. The % recovery was dependent on the quantity of soil or vegetation on the fabric surface. If the mud has soaked into the fabric this tends to bind the fibres to the fabric surface and this may prevent the recovery of the fibres.

Shaking and brushing the fabric resulted in large quantities of debris. It was difficult to recover the fibres from this. Some fibres were trapped in the bristles of the toothbrush and were recovered using forceps.

Tapelifting was found to be the best method of recovering the seeded fibres from the fabric surface. On average 72% recovery was achieved from the fabrics using this method, whereas 58% recovery was obtained by brushing the fabric. Multiple tapelifts were required and each tapelift removed a proportion of the fibres. In these experiments it was shown that a minimum of 3 tapelifts of the fabric surface should be carried out. The more heavily soiled surfaces required 8 or more successive tapelifts to recover the seeded fibres.