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Abstrak :

Until recently in Indonesia, personal identification through cigarette butts with the method of DNA analysis (DNA profiling) have not been used, then this research may provide answers on issues related to the effectiveness of the use of cigarette butts as a forensic identification. In the field of molecular forensic medicine, one of the very helping investigation examination is examination of the evidence (trace evidence) that exist in the body of the victim/perpetrator of crime and crime scene/crime scene (crime scene investigation), but the problem often encountered in cases such as crimes accompanied by efforts disappearance of evidence, for example by burning the victim so that victims can not be identified. This study has found that cigarette butts can be used as alternative materials in personal identification. Good cigarettes butts on cigarettes and cigarette filters consist of two parts, namely a pack of cigarettes / papers and filter / tobacco. Cigarette packages in the form of paper in direct contact with the lip or lip mucosa. Use THO1 loci, D17S5 and vWA loci given that the first locus is one developed by the Forensic Science Service, as well as loci has a probability of a match with the comparison: 50 million.

Keyword :

DNA isolation, cigarette butts, identification

Daftar Pustaka :

Albert B et.al Molecular biology of the cell.3nd ed Garland Publishing 1994 New York
Bhaskar SN Orban\â€™s Oral Histology and Embryology, eleventh edition Mosby Year Book 1986 London

EFFECTIVENESS OF CIGARETTE BUTTS AS AN ALTERNATIVE MATERIAL FOR FORENSIC DNA IDENTIFICATION WITH POLYMERASE CHAIN REACTION (PCR) IN SHORT TANDEM REPEAT (STR) LOCI

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ABSTRACT

Until recently in Indonesia of personal identification through cigarette butts with the method of DNA analysis (DNA profiling) have not been used, then this research may provide answers on issues related to the effectiveness of the use of cigarette butts as a forensic identification. In the field of molecular forensic medicine, one of the very helping investigation examination is examination of the evidence (trace evidence) that exist in the body of the victim/perpetrator of crime and crime scene/crime scene (crime scene investigation), but the problem often encountered in cases such as crimes accompanied by efforts disappearance of evidence, for example by burning the victim so that victims can not be identified. This study has found that cigarette butts can be used as alternative materials in personal identification. Good cigarettes butts on cigarettes and cigarette filters consist of two parts, namely a pack of cigarettes / papers and filter / tobacco. Cigarette packages in the form of paper in direct contact with the lip or lip mucosa. Use THO1 loci, D17S5 and vWA loci given that the first locus is one developed by the Forensic Science Service, as well as loci has a probability of a match with the comparison: 50 million

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INTRODUCTION

In criminal or civil, personal identity plays a large. Accurately determine the personal identity is very important in the investigation because of the mistake can be fatal in a judicial process (Idries, 1997). Forensic molecular first introduced by Sir Alex Jefreys year 1985, which utilizes the knowledge of medicine and biology at the molecular or DNA level (Deoxyribonucleotic acid). In one forensic medical examination is very helpful investigation of the examination of evidence, which is in the body of victim/offender and the crime scene (the scene). During this specimen/sample that is widely used in the examination of DNA to identify, is spotting blood/blood, patches of sperm, vaginal swab, buccal swab and bone (Kusuma, 2004).

Cigarette butt found at the scene suspected the former, there is still liquid saliva and mucosal epithelium attached lip. Discarded cigarette butts at the scene could contain DNA can be obtained from the saliva and mucosal epithelial lip. So that the mouth mucosa epithelium attached to the cigarette butts that allows for examination of DNA identification by the profiling. Until recently in Indonesia of personal identification through cigarette butts with the method of DNA analysis (DNA profiling) is not much to do, then this research may provide answers on issues related to the effectiveness of the use of cigarette butts as a forensic identification.

Based on the above background, then the problem can be formulated is whether examination of DNA analysis on DNA isolated from cigarette butts can be used as alternative materials for the identification of someone's identity. This study aims to prove personal identity through DNA analysis of isolated DNA from cigarette butts with the special purpose to determine the personal identity through an analysis of the isolated DNA from cigarette butts on the loci TH01, vWA and D17S5 and to compare the results of electrophoresis of DNA banding pattern of DNA isolated from cigarette butts and isolation of DNA from blood. Results of this study are expected to provide scientific information for Forensic Medicine, especially in personal identification and able to provide assistance to investigators in this case the police in enforcing the law in Indonesia.

MATERIALS AND METHODS

The research design used in this study is an observational laboratory. Samples taken from a cigarette butt volunteers and volunteer blood as a comparison. The criteria in the study sample are (1) volunteers are a man or a clove cigarette smokers, aged 30-45 years, started smoking at least five years, and at least one pack a day spent going in a week; (2) blood samples from the same volunteers as a comparison material. The research activities conducted at the Human Genetic Laboratory of Tropical Disease Center (TDC) UNAIR. Schedule study began in July 2006 until August 2006. Materials research of this study are DNAzol Reagent, solution 100% & 70% ethanol, PCR Mix, Bus acrylamid, agarose, Temed, Tris Boric EDTA (TBE) 0.5%, 100 bp marker and marker K562 and THO1, and D17S5 vWA as primary.

RESULTS

Table 1. Concentration and Purity of DNA on Cigarette Butts

Sample	Quality (λ 260/ λ280)	Levels (μg/ml)
1	1,21	28,3
2	1,1	24,5

From Table 1, the levels of DNA isolated from a cigarette butt from two samples of each: g / ml.μ g / ml and 24.5 μ28.3 DNA content can still be used in the process of DNA profiling, according Notosoehardjo (1999) g / ml forμrequires the number or DNA content of approximately 20 typing. The purity of DNA isolated from patches of sweat on clothes samples: 1-2 (ideally 1.8), allowing for PCR amplification (Muladno, 2000).

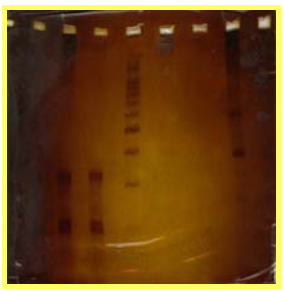

Figure 1. Visualization of Loci THO1, vWA & D17S5, Sample No. 1
A : Cigarette butts,
M : Marker ladder 100 bp
B : Blood

Table 2. Results of Electrophoresis Visualization Reading between Cigarette Butt with Blood Samples at THO1 locus, D17S5 and vWA.

No.	Sample	Locus THO1	Locus vWA	Locus D17S5
1	1 Cigarette butts / Blood	Identical	Identical	Identical
2	2 Cigarette butts / Blood	Identical	Identical	Identical

DISCUSSION

This study has found that cigarette butts can be used as alternative materials in personal identification. Good cigarettes butts on clove cigarettes and cigarette filters consist of two parts, namely a pack of cigarettes / paper and the filter / tobacco. Cigarette packages in the form of paper in direct contact with the lip or lip mucosa.
By histology lips have the same layer with other skins. In the area there lips lips transition zone between the skin and lining of the lips that lenders are often called red zone. This zone is only in humans.

Leather outer lip surface coated by a thick epithelial keratinization by a corneum layer, the dermis area, while there are many sebaceous glands and sweat glands. This transition zone on the inner lip mucosa ketatinated, where the transition zone ends. Furthermore, not lip berkeratinisasi mucosal epithelium. This zone is characterized by papilla formation in propria reaching the epithelial and capillaries near the surface, thus giving the red color on lips, there are also some of the sebaceous glands to keep moisture by the tongue (Lesson et al, 1981; Bhaskar, 1986). Saliva / saliva produced by the parotid gland and labial gland (lip), which produces the form of fluids and electrolytes that help the digestive process in the mouth it is also the glandular epithelial cells are degraded with saliva (Atmaja, 2006).

So that the cigarette butts that have been used by many smokers there are inherent or independent existence lip epithelium and gland fluid secretion results in the lips and the saliva. With the epithelium derived from lip epithelium, glandular epithelial cells of glands on the lips degraded and the saliva, which alleged the existence of DNA. The presence of amplification method Polymerase Chain Reaction (PCR) with minimal levels of DNA typing can be used in the examination. From various studies on the use of PCR in the field of forensic medicine in amplify the target DNA, it was reported that the PCR technique has a very high success rate, because it requires relatively very little DNA and the level of 'freshness' is relatively low compared to techniques

Restriction Fragment Length Polymorphisms (RFLP). Use THO1 loci, vWA and D17S5 loci mengingta that the first locus is one developed by the Forensic Science Service, as well as loci has a probability of a match with the comparison of one in 50 million (Butler, 2003)

CONCLUSIONS

From the results of this study was that the isolation of DNA from cigarette butts can be an alternative material in forensic identification. Which are generally isolated DNA from cigarette butts to get a low grade or quantity of DNA or even less so with the PCR amplification method, target DNA can be amplified even minimal levels.

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