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# CAN DNA BE EXTRACTED FROM TOOTH PULP? A PRELIMINARY STUDY

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Forensic identification is easy if an entire human body is available with minimal decomposition. Once decomposition has set in or when parts of the body are missing, identification becomes difficult or at times impossible using classical methods. In such situations DNA has proved to be useful for identification and increasingly, forensic studies utilize DNA profiles of individuals to establish identity.

Of the many parts of a human body, the tooth which is composed of a highly mineralized tissue, survives most postmortem circumstances like decomposition, immersion in water, burial and fires that reach high temperatures. Enclosed within this hard tissue (enamel and dentine), lies the dental pulp, which consists of a specialized connective tissue with many types of nucleated cells. Thus, the dental pulp could be utilized as a source for the extraction of genomic and mitochondrial DNA, for purposes of forensic studies.

This study describes a method for the extraction of DNA from Human teeth. Teeth and blood samples were collected from individuals who visited the Dental Hospital, Peradeniya. Non-carious teeth that were extracted for orthodontic purposes and blood samples of the same individuals were used for the extraction of DNA. The surface of the tooth was cleaned with distilled water and split longitudinally in order to extract the DNA rich pulp. It is possible to isolate and extract DNA from human tissues using Phenol-Chloroform method, Chelex-100 method, using liquid Nitrogen etc.

The pulp of the tooth was collected using pipettes, an excavator and a surgical syringe where necessary. In this study the DNA was extracted using the Phenol/Chloroform method. The pulp was taken into a 1.5 ml polypropylene tube. Equal amount of digestion buffer was added and incubated for 1 hour at 37 °C. Furthermore, an equal volume of phenol – chloroform – isoamyl alcohol 25:24:1 was added and mixed. The suspension was centrifuged at 4000 rpm for 10 minutes. The top aqueous layer was aspirated and an equal volume of chloroform: isoamyl alcohol 24:1 was added to the aspirate. Again the top layer was centrifuged and aspirated and 2 volumes of cold absolute ethanol and 1/10 volume of 3 M Sodium Acetate of pH 5.2 was added and left at – 20 °C temperature to precipitate the DNA.

The extracted DNA was visualized on an agarose gel, stained with ethidiumbromide and viewed under UV light. In the gel, a smear produced by the DNA was found and a photograph was taken. It can be concluded that DNA from tooth pulp can be extracted using this method.