ABSTRACT

SEX DETERMINATION OF HUMAN SKULL BY DNA ANALYSIS AND MORPHOMETRY USING FOURIER ANALYSIS

Key words : DNA analysis, Fourier analysis, human skull, morphometry, sex determination

DNA profiling has been established as a valuable tool in the investigation and prosecution of violent crimes, sex offenses. It has also proven of great use in the identification of skeletal and other body remains. Although, the Restriction Fragment Polymorphism (RFLP) analysis is accepted as a reliable means for typing DNA from forensic materials, however, since not all samples always provide a sufficient of DNA for RFLP analysis, the application of PCR-based typing methods for degraded DNA and/or subanalytical quantities is rapidly becoming the primary method for identifying and distinguishing among individual. The objective of the research were: Looking for a method for DNA extraction and analysis from compact bone of human remains for sexing and that could be resolved using ordinary agarose gel electrophoresis using DNA silver staining method for visualization of DNA in agarose. Due to its fast, simplicity and the stability of the reagents used, the method herein described is especially suitable for routine clinical applications, avoiding the use of polyacrylamide gel, chemical carcinogens (ethidium bromide) and UV transilluminators. In summary, we have developed a simple, reproducible, fast, and sensitive procedure to identify the sex of a human bone.

Instead of DNA analysis this research also revealed sex determination of human skull by morphometry using Fourier analysis.In this study, Fourier analysis was applied in quantifying the shape of forehead, the back of head, neurocranium and the mandibule. The aquracy of this system to determine sex for the forehead shape of skulls was 91,58%, for the neurocranium was 93,65% and for the mandibule was 100%. Os occipitalis was correctly classified=68,00%. Using the system reported, even unexperienced operator can determine the sex of cranial specimens easily by tracing the contour line. Because the sexing program could be done using GW Basic, instalation to other PC computer was easier.