

Technical Poster No. 29



Study of Suitable Bone Region for DNA Extraction and Downstream Applications – A Case Study

Poster No. 29

International Symposium on Human Identification (ISHI) 2018, Hyderabad, India

15-17 November 2018

Sujatha TD¹, Arunagiri S¹, Radha H¹, Mahalakshmi M¹, Kavita K¹, Rajas W^{2*}

¹ DNA Division, Forensic Sciences Department, Chennai, India
² Molecular Biology, HiMedia Laboratories Private Limited, Mumbai, India

*Email ID: rajas@himedia.in

Introduction

Bone and dental remains often represent the best resource for victim identification as DNA is preserved better in the calcified matrix. However, DNA profiling from bones is a time-consuming process. Current sampling strategy for laboratories typing bones for human identification include samples obtained from femur, tooth, and temporal bone. Latest studies suggest that the small bones of the hands and feet were very similar or even better in DNA yield. These bones can be easily sampled with a disposable scalpel and thus reduce potential DNA contamination.

Objective

The objective of the study was to compare two automated nucleic acid extraction systems for DNA recovery and STR profiles from two anatomical locations in a single bone sample. The two locations include metatarsals and distal phalanx (shaft) region.

Materials and Methods

Results

Figure 1 Average concentration of small autosomal target quantified from bone samples.

Figure 2 Average concentration of large autosomal target quantified from bone samples.

Figure 3 Average concentration of male target quantified from bone samples.

Figure 4 Degradation index calculated from bone samples.

Figure 5 Amplification of bone DNA from the metatarsals region using ISHI's Meta Nxt Mag32.

Conclusion

This study demonstrated that the metatarsals region yielded a significantly higher DNA recovery than the distal phalanx region.

1. Unlike STR profiles are generated from the metatarsals region (table 1).
2. The DNA concentration obtained from 'Metatarsals' was 40% higher than 'Distal phalanx' (table 1 and figure 1-4) (table 1).
3. The degradation index of the samples collected from the 'Metatarsals' was 80% higher than the 'Distal phalanx' (table 1).
4. The amplification index of the samples collected from the 'Metatarsals' was 80% higher than the 'Distal phalanx' (table 1).
5. The studies show that the 'Metatarsals' region yielded a significantly higher DNA recovery than the 'Distal phalanx' region.
6. The study showed that the 'Metatarsals' region yielded a significantly higher DNA recovery than the 'Distal phalanx' region.

References

1. ...
2. ...
3. ...
4. ...
5. ...
6. ...