

A CASEWORK STUDY OF DEGRADED BONE USING GlobalFiler™ AND ForenSeq SIGNATURE KIT

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DNA analysis from human remains is of immense relevance in missing persons identification and disaster victim identification (DVI). DNA degrades gradually in hard tissues, such as bones and teeth under a high temperature, humidity, pH, geochemical properties of the soil, the presence of microorganisms and all other factors that affect the preservation of DNA in skeletal remains. The GlobalFiler™ kit simultaneously amplifies and detects 21 autosomal loci including CODIS extended set of STR loci. The kits was designed to combine all 21 autosomal STR loci along with a novel male specific Y insertion/deletion marker the sex-determining marker, amelogenin. Thus, GlobalFiler™ combines the CODIS extended set of loci and includes seven autosomal STR loci from the expanded European Standard Set of Loci (ESSL). The kit also includes the highly discriminating SE33 locus. The aim of this study was to profile the old bone sample using GlobalFiler™ for casework that previously profiled using Identifiler Plus kit using 3500 capillary electrophoresis (CE). This study investigated the success rate of short tandem repeat (STR) typing of casework bone samples from Qatar forensic laboratory observed a higher STR success rate using GlobalFiler™ PCR kit and ForenSeq Signature kit, which contains more than 10 loci with a maximum size of 200 bp. Thus, GlobalFiler™ could potentially be the optimum amplification choice for the limited amounts of DNA obtained from challenged bone samples. The performance of the GlobalFiler™ kit and the profile quality was examined for the degraded bone sample to determine if it could generate more robust genetic information in addition to the MPS results.

Keywords: GlobalFiler™; Autosomal STR; Validation; Forensic; Qatar.