



Master Thesis Defense

<u>Entitled</u> SHORT TANDEM REPEAT DIVERSITY IN INDIAN AND PAKISTANI POPULATION LIVING IN THE UNITED ARAB EMIRATES

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https://eu.bbcollab.com/guest/06a863bcf3b94aa696b6878982901514

<u>Abstract</u>

Short Tandem Repeats (STRs), have become increasingly popular markers of choice due to its wide array of advantages in the sector of forensic investigation. It is necessary to expand genetic research into residing populations *i.e.*, Indian and Pakistani, in the same geographic region such as in the United Arab Emirates (UAE). The objectives of this study were to: (1) develop an allelic frequency database for the most potent amplification kit; and (2) determine the significance of increasing the number of STR loci used in forensic DNA analysis. This study focused on 23 autosomal STR loci, namely D3S1358, vWA, D16S539, CSF1PO, TPOX, D8S1179, D21S11, D18S51, D2S441, D19S433, TH01, FGA, D22S1045, D5S818, D13S317, D7S820, D10S1248, D1S1656, D12S391, D2S1338, D6S1043, Penta D and Penta E which were evaluated in a total of 701 Indian and Pakistani population, living in the UAE. Blood samples were collected and the studied loci were amplified using VeriFiler™ Express PCR Amplification Kit and electrophoresed using ABI 3500 Genetic Analyzer. Arlequin and Powerstat software were utilized to analyze the forensic parameters and population structure analysis. A total of 248 and 298 alleles were observed in the Indian and Pakistani population, respectively. Among all studied loci, prominent results were attained from Penta E. Genetic diversity between the two populations, ranged from 70% (TPOX) to 92% (Penta E). The combined probability of power of exclusion (CPE), power of discrimination (CPD) and random match probability (CMP) in the Indian population was 0.999999991519, combined Pakistani population showed probability of 0.999999990719, 0.9999999999999999999999999999901 and 4.4x10⁻²⁶, following the same order of parameters previously mentioned. This confirms that these 23 loci are suitable for individual identification, paternity testing, kinship analysis and population diversity studies used in forensic practice.

Keywords: Forensic science, Indian population, Pakistani population, Penta E, population diversity, power of discrimination, short tandem repeats, United Arab Emirates.