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**Allele frequencies of the New European Standard Set (ESS) loci plus SE33 locus in Dalmatian Human Population****Dujić Bilušić S**<sup>1</sup>, Džehverović M<sup>2</sup>, Čakar J<sup>2</sup>, Buljugić D<sup>2</sup>, Kovačević L<sup>2</sup>, Pehlić M<sup>1</sup>, Polašek O<sup>1</sup>, Rudan I<sup>3</sup>, Anđelinović Š<sup>4</sup>, Primorac D<sup>4</sup>, Škaro V<sup>5</sup>, Projić P<sup>5</sup>, Marjanović D<sup>2,5</sup>

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In response to the ENFSI and EDNAP groups' call for new STR multiplexes for Europe, Promega developed a suite of four new DNA profiling kits. One of them is PowerPlex ESX 17 that we have used in this study. In previous population studies of Dalmatian (Southern Croatian) human population, 15 STR loci included in the AmpFISTR®Identifiler® and Powerplex 16 were used. Additionally, we have decided to analyze 6 additional new STR loci (D22S1045, D1S1656, D10S1248, D2S441, D12S391, SE33). This study is based on an observation of representative sample of Dalmatian human population. A total of 120 unrelated individuals from different parts of Dalmatia participated in this study. Qiagen Micro™ Tissue Kit was used for DNA extraction from whole blood, Quantifiler® assay for quantification and PowerPlex ESX 17® System for amplification and detection. The total volume of each reaction was 5 ml. The PCR amplifications have been carried out in ABI 9700 Thermal Cycler. Electrophoresis of the amplification products was performed on an ABI 310 PRISM. Numerical allele designations of the profiles were obtained by processing with Gene Mapper® IDv 3.2 Software. Deviation from Hardy-Weinberg equilibrium, observed and expected heterozygosity, power of discrimination and power of exclusion were calculated. Also, we have compared Macedonian data with data obtained from other neighboring populations with available data for observed loci. Deviation from Hardy-Weinberg equilibrium, observed and expected heterozygosity, exact test of population differentiation and pairwise  $F_{st}$  were calculated within Powermarker v3.25, since power of discrimination and power of exclusion within PowerStats.

**Keywords:** New European Standard Set, PowerPlex ESX, Dalmatia