DEVELOPMENT AND VALIDATION OF A RAPID PCR METHOD FOR THE POWERPLEX® 16 SYSTEM FOR FORENSIC DNA IDENTIFICATION

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Currently, the amplification step of most forensic DNA profiling systems takes 3-4 h to complete. A decrease in the amplification time would allow for increased laboratory throughput, which may help reduce backlogs. By using the *SpeedSTAR*™ HS Polymerase (Takara Bio, Otsu, Japan) in combination with the Veriti® (Applied Biosystems, Foster City, CA, USA) rapid thermal cycler, the amplification time for the PowerPlex® 16 HS (Promega, Madison, WI, USA) kit was reduced by 66% (1h). The sensitivity of this fast method was comparable to the standard system (0.13 ng). Although this rapid protocol showed an increase in average stutter ratios (2.8%) and a decrease in average peak height ratios (7%) across all loci when compared with standard conditions, it was able to consistently generate reliable DNA profiles. The results of this study indicate that the rapid protocol could be implemented in forensic laboratories with an optimal range of 0.25 ng – 2 ng of input DNA using appropriate analytical interpretation guidelines.

Keywords: Forensic DNA · Short tandem repeats · Rapid PCR · PowerPlex®