INVESTIGATION OF THE INFLUENCES OF COMMERCIAL DYE'S INHIBITION ON POLYMERASE CHAIN REACTION FOR FORENSIC APPLICATION

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Polymerase chain reaction (PCR) inhibition is the most common cause of PCR failure when adequate amount of DNA is present. Although the presence of inhibitor has a known effect, the mechanism of PCR inhibition is often unclear. Researchers set out to examine effects of inhibitors by measuring the degree of inhibition of five dyes (two reactive: Yellow 205, Blue 21 and three disperse: Red 167, Yellow 114, and Red 153), and studied whether the inhibition was concentration dependent. In this study, 1.0 µL and 2.5 µL of pathogen-free human male blood were utilized to stain 5 commercially dyed fabric samples. DNA extraction was performed by organic extraction and concentrated by ethanol precipitation. Human male DNA was quantified by real time PCR, and amplified by 7900 thermocycler, and finally processed by capillary electrophoresis on ABI 310 genetic analyzer. Data was analyzed utilizing the software *GeneMapper ID V 3.2.1.* Rates of inhibition were observed in all samples, two having been concentration independent and the rest reflecting an inverse relationship. A threshold of inhibition of 50% was observed.