Fluorescence biosensor based on *n*-(2-aminoethyl) glycine peptide nucleic acid for a simple and rapid detection of *Escherichia coli* in fresh-cut mango

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Abstract

Safety of fresh-cut produce is essential in quality control management and quality assurance. Conventional methods used for quality and safety monitoring, including plate counting, immunological methods, so far are time demanding 2-7 days, and relies heavily on laboratory facilities. These demonstrate the need for a better quality and safety monitoring method to control risks associated with these products. We have developed a simple and rapid *Escherichia coli* detection method less dependent on laboratory facilities for fresh-cut mango based on loop-mediated iso¬thermal DNA amplification with fluorescence signal detection upon hybridization of the target DNA products with peptide nucleic acids. Detection processes were based on an enrichment procedure made directly from fresh cut mango to enable DNA ampli¬fication without any sample pre-treatment such as DNA extraction and a specific DNA amplification of *mal*B gene at 65°C isothermal temperature. DNA signals were measured by fluorescence visualization on a UV light source after hybridization with *N*-(2-aminoethyl) glycine peptide nucleic acid probe and its corresponding quencher. The method had a limit of detection at 100 copies of *E. coli* DNA per 50 g of sample. No cross-reactivity was observed from samples contaminated with other bacteria. Detection could be completed within 1 hour of operation without the need of a thermo cycler. This method constitutes a basis for a rapid, yet simple detection of pathogenic bacteria and is suitable for field application.