Rapid and sensitive detection of *Vibrio cholerae* using loop-mediated isothermal amplification targeted to the gene of outer membrane *ompW*

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Abstract

Loop-mediated isothermal amplification (LAMP) assay for rapid and specific detection of *Vibrio cholerae* was developed using a set of five designed primers that recognized specifically the *V. cholerae ompW* gene. The optimized time and temperature conditions for the LAMP assay were 75 min at 65^{o}C, respectively. The LAMP method accurately identified 16 isolates of *V. cholerae* but did not detect 28 non-*cholerae Vibrio* isolates and 37 non-*Vibrio* bacterial isolates. The sensitivity of LAMP for *V. cholerae* detection in pure cultures was 2.2 x 10^3 CFU/ ml or equivalent to 8 CFU per reaction. In the case of spiked shrimp samples without enrichment, the detection limit for *V. cholerae* was 2.2 X 10^4 CFU/g or equivalent to 20 CFU per reaction, while that of PCR was 100 CFU per reaction. The developed LAMP assay targeting *ompW* gene was rapid, specific and sensitive for V. cholerae detection. This assay can replace laborious biochemical test for identification of *V. cholerae* in contaminated food sample.

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Keywords: *Vibrio cholerae*, loop-mediated isothermal amplification, *ompW*, PCR.