Modification of gelatin–DNA interaction for optimised DNA extraction from gelatin and gelatin capsule

ABSTRACT

BACKGROUND: Poor quality and quantity of DNA extracted from gelatin and gelatin capsules often causes failure in the determination of animal species using PCR. Gelatin, which is mainly derived from porcine and bovine, has been a matter of concern among customers in order to fulfill religious obligation and safety precaution against several transmissible infectious diseases associated with bovine species. Thus, optimised DNA extraction from gelatin is very important for successful real-time PCR detection of gelatin species. In this work, the DNA extraction method was optimised in terms of lysis incubation period and inclusion of pre-treatment pH modification of samples.

RESULTS: The yield of DNA extracted from porcine gelatin was significantly increased when the pH of the samples was adjusted to pH 8.5 prior to DNA precipitation with isopropanol. The optimal pH for DNA precipitation from bovine gelatin solution was then determined at the original pH range of solution: pH 7.6 to 8. A DNA fragment of approximately 300 base pairs was available for PCR amplification.

CONCLUSION: DNA extracted from gelatin and commercially available capsules has been successfully utilised for species detection using real-time PCR assay. However, significant adulterations of porcine and bovine in pure gelatin and capsules have been detected, which require further analytical techniques for validation.

Keyword: Gelatin; DNA extraction; Gelatin capsule; Real-time PCR