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Comparison of Real-Time PCR and FTIR with Chemometrics Technique in Analysing Halal Supplement Capsules

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Abstract : Halal authentication and verification in supplement capsules are highly required as the gelatine available in the market can be from halal or non-halal sources. It is an obligation for Muslim to consume and use the halal consumer goods. At present, real-time polymerase chain reaction (RT-PCR) is the most common technique being used for the detection of porcine and bovine DNA in gelatine due to high sensitivity of the technique and higher stability of DNA compared to protein. In this study, twenty samples of supplements capsules from different products with different Halal logos were analyzed for porcine and bovine DNA using RT-PCR. Standard bovine and porcine gelatine from eurofins at a range of concentration from 10⁻¹ to 10⁻⁵ ng/µl were used to determine the linearity range, limit of detection and specificity on RT-PCR (SYBR Green method). RT-PCR detected porcine (two samples), bovine (four samples) and mixture of porcine and bovine (six samples). The samples were also tested using FT-IR technique where normalized peak of IR spectra were pre-processed using Savitsky Golay method before Principal Components Analysis (PCA) was performed on the database. Scores plot of PCA shows three clusters of samples; bovine, porcine and mixture (bovine and porcine). The RT-PCR and FT-IR with chemometrics technique were found to give same results for porcine gelatine samples which can be used for Halal authentication.

Keywords : halal, real-time PCR, gelatine, chemometrics
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