Detection of Genetically Modified (GM) Food Items in the Market Using Real Time PCR (RT-PCR) Based Assay

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Abstract

The amount of commercially available food items containing genetically modified organisms have increased in recent years. Regulation for the labeling of Genetically Modified food is required in most of the countries. Sri Lanka is one of the countries having labeling policy for food products containing Genetically Modified Organisms. For this purpose, reliable and accurate detection methods are necessary. The Real time-PCR is the most reliable detection method to detect Genetically Modified Organisms. The aim of this study is to detect genetically modified food items in market using Real time-PCR assay. The CTAB method and Mericon food kit methods were used for the extraction of DNA from the market food products. The Mericon GMO detection kit was used to perform the Real time-PCR assays. The screening of the products was based on detection of the Cauliflower mosaic virus 35S promoter. According to the results, all of the extracted samples from CTAB method were positive while one of the four extracted samples from Mericon food kit was positive. The false positive results obtained from the CTAB extraction could be due to the infection of cauliflower mosaic virus in the food samples. However, the ratio of positive samples decreased after performing Mericon kit method. The cauliflower mosaic virus contamination could have removed by the high purification of Mericon food kit. According to the results, out of four samples one sample imported from U.S.A. was positive for CaMV 35S promoter, indicating that it is a GMO. With further evaluation, this method could be used in future testing for GMO.

Keywords - Genetically modified organisms, DNA Extraction, Real time-PCR, Cauliflower mosaic virus 35S promoter