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Screening for GMOs in Sri Lanka: A preliminary study with maize

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Maize is the second most cultivated coarse grain in Sri Lanka. A massive increase in the production of maize in Sri Lanka has been observed over the last decade. Maize has been genetically modified (GM) to provide characteristics such as herbicide tolerance, insect resistance and changed crop composition and it is the second most cultivated genetically modified crop in the world. Various countries including the European Union have implemented rules and regulations to regulate GM food cultivation and its consumption. Sri Lanka is yet to implement laws to regulate the cultivation and labeling of GM food. Consumers are currently unaware of the cultivation of GM maize and its presence in various food products in Sri Lanka. The aim of this study was to establish a qualitative method to screen for the presence of GM elements in maize seeds obtained from various regions of Sri Lanka and selected food products containing maize as an ingredient. Therefore, the CaMV35s promoter and the NOS terminator were targeted for detection using the Polymerase Chain Reaction (PCR). Maize samples (n = 10) cultivated in Sri Lanka and food products (n = 7) with maize as the major ingredient were purchased from different regions of Sri Lanka. A cetyltrimethylammoniumbromide (CTAB) based column method was used to extract genomic DNA and it was subjected to PCR to detect the presence of GM elements. An internal control for maize (maize invertase gene) and DNA from certified reference material (European Reference Materials, Belgium) was included in each assay as a positive control. Furthermore, each assay contained a non-template control and an extraction reagent control. The primers for the assay were custom synthesized. A 225 bp region of maize invertase gene, a 123 bp region of CaMV 35s promoter and a 180 bp region of NOS terminator was PCR amplified. The results indicated that nine out of ten cultivated maize samples and two out of seven maize based food products contained GM elements. Our study confirms the cultivation of GM maize in Sri Lanka and the presence of it in commercially available food products.

Keywords: PCR, GM Crops, maize, GM Food

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