

Detection of genetically modified organisms (GMOs) using molecular techniques in food and feed samples from Malaysia and Vietnam

Abstract

Food labeling in accordance with Novel Food Regulation has been enforced in the European Community since 1997 with a series of updated legislations namely, EC/258/97, EC/1139/98, EC/49/2000, EC/50/2000 and EC/1829/2003. Guidelines and labeling regulations for the use of GMOs materials in food and feed products has also been introduced in Malaysia and Vietnam. Therefore, the demand for the establishment and development of a robust and rapid operation procedure for GMO detection has increased recently in both countries. The procedure of GMO detection emphasizes not only on detection tests but also on confirmation assays. This study employed PCR technology for detection and direct DNA sequencing for confirmation procedures respectively. The results demonstrated for the first time the presence of GM plants with glyphosate-resistant trait led by the control of P35S promoter and NOS terminator in either Malaysian or Vietnamese feed with high frequency (20 positive samples out of 24 analyzed samples). The P35S promoter, EPSPS gene and NOS terminator sequences obtained showed some mutations on single-stranded and double-stranded targeted sequences caused by single nucleotide insertion or single nucleotide changes. These results reinforce the need for development of detection procedures to comply with food/feed labeling system