

[BIO13]

Detection of genetically modified food (soybean and maize) (raw and processed food) by using polymerase chain reaction (PCR)

Rozila Alias, Son Radu, Suhaimi Napis, Noorjahan Banu Mohamed Alitheen

A large number of Genetically Modified Organisms (GMOs) are approved for use and are grown on large and increasingly scale. Some of these GMOs are approved in the European Union (EU) and other countries. According to EC Novel Food Regulation 258/97 and Regulation 1139/98/EG and 49/2000, foods are require labeling if more than 0.9% of any ingredient originates from a GMO. Since GMOs are widely used and entered the worldwide market especially in food industry, the reliable and sensitive methods are needed to provide the detection of GMOs in food matrices. The methods are based on PCR method. In this study, the objectives are to develop and establish a standard DNA extraction methods for raw and processed foods, to detect the element genes of GMO (CaMV35S promoter, NOS terminator, EPSPS gene and Cry1A gene) using by PCR method and lastly to screen the Genetically Modified Roundup-Ready Soybean (GTS 40-3-2) from the samples in a market. The PCR methods have been proven as an effective, accurate and reproducible method for GMOs detection. 6 pairs of primers were suitable for used in this procedure to detect GMO in raw and processed soybean, maize and animal feeds. From the results, there were 7 patterns of PCR analysis which showed the positive results by using 4 pairs of primers for GMOs detection. From the 111 samples, there were 17 samples showed positive results for detection of Genetically Modified Roundup-Ready Soybean (4 raw soybeans, 1 taufufa and 12 animal feed samples) and 6 samples showed positive results with Cry1A gene which was 1 sample from animal feed and 5 samples from maize. 50% of animal feed (12 out of 24) samples tested, were positive with three genetic elements (35S promoter, NOS terminator, EPSPS gene or Cry1A gene). All of them were 28 samples containing GMOs. Thus, it is expected that more genetically modified organisms (GMOs) will come into the market over the next few years. In Malaysia, there is a need for labeling the GMO products and monitoring incoming raw GMOs materials with standard regulation for imported of GMOs contaminated food.