Detection and identification of genetically-modified tomatoes using PCR technique and sequencing

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Abstract

Genetically modified (GM) plants are one of the great achievements of modern biotechnology in agriculture, which their cultivation has been increased in recent years. According to the international biosafety law, the import of genetically modified plants without the permission of Biosafety Committee into the country is prohibited. Therefore, we need an accurate method for assessing whether they are transgenic or not. In this study, samples of tomatoes were collected from various sources such as shops and greenhouses in Isfahan province to evaluate if they are transgenic. The initial screening of all samples was performed using primer pairs P35S F/R for CaMV35S promoter and NOS-1/NOS-3 for NOS terminator, amplified 195 bp and 180 bp of 35S promoter and NOS terminator sequences, respectively. The sequence of fragments was verified by comparison with known sequences in GeneBank and indicated a 100% homology, showing the studied samples are genetically engineered. The tomato samples were also tested for the presence of antisense polygalactoronase (PG) gene using the primer pair PG F/R, which amplified 384bp in all samples. Sequence analysis of this fragment resembled 100% similarity with the sequence of PG antisense gene in Gene Bank database. Results of this study showed that there is a transgenic tomato in the Iranian market. But, the consumers are not aware of its changed nature.

Keywords: Tomato, GMO, PCR, Detection.

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