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Poster Abstract – B.10

NEW METHODOLOGY FOR TOMATO TRACEABILITY IN TOMATOES SUPPLY CHAIN

TURCI M., SAVO SARDARO M.L., MARMIROLI M., VISIOLI G., MAESTRI E., MARMIROLI N.

Department of Environmental Science, Division of Genetics and Environmental Biotechnology, University of Parma, Viale G.P. Usberti, 11/A, 43100 Parma (Italy)

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The European Union (EU) has developed a legal framework to evaluate the safety of food products. In particular, internal traceability has been indicated as a production action to improve reliability of labelling, for certifying the origin and the quality of products on the market and for preventing fraudulent or deceptive labelling. On the other hand, EU has considered the use of high-quality raw material as a prerequisite to ensure a genuinity, safety and adequate nutritional value to the food product.

Molecular methodologies are acquiring great interest for traceability because they can help in tracking a given item at each stage in the food chain from “farm to the fork”. In particular DNA analyses allow for the identification of traces of raw material present in any food matrices as a principal component or contaminant. Promising results come from the application of molecular markers, especially those based on PCR such as: Random Amplified Polymorphic DNA (RAPDs), Amplified Fragment Length Polymorphisms (AFLPs) and Simple Sequence Repeats (SSRs).

In the present study we demonstrated that SSR markers are useful for the traceability of tomato food supply chain. SSRs are used in genetic analysis and in fingerprinting studies because they are characterized by an high degree of polymorphism and can be applied on high-throughput analytical platform like microarray.

The experience of our laboratories, acquired in detection of GMOs in processed foods and in olive oil traceability, allowed us to improve considerably the DNA extraction techniques from complex food matrices.

We demonstrated that traces of tomato DNA are present also in processed products like tomato sauce, concentred tomato and peeled tomato. The quality and the quantity of DNA extracted are dependent on the sample itself, the processing procedure used for production of the food, and the chemical and physical parameters of the extraction methods utilized. In fact, exposure to heat and to physical or chemical treatments are major causes of fragmentation of high molecular weight DNA that can affect its amplificability.

In this study, we report a protocol developed to extract DNA from tomato sauce and show how DNA microsatellite fragments up to about 270 bp long can be successfully amplified and used to identify the tomato cultivar in processed tomato.