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Poster Communication Abstract – 7.13

GENETIC CHARACTERIZATION OF THE LANDRACE GIAGIù FOR ITS TRACEABILITY IN THE TOMATO FOOD CHAIN

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In the last few years, considerable interest is growing for the tomato “Pomodorino giallo del Vesuvio” which differs from the traditional “Pomodorino del Piennolo” for the yellow color of its fruits. Among the great variability of yellow tomatoes, one landrace named GiaGiù (E40) shows high interest for its quality traits, such as high titratable acidity and glutamic acid and pectin content in the fruit, thus increasing its demand for both fresh consumption and cooking purposes. The aim of this work is to distinguish the GiaGiù landrace from other yellow tomatoes by the aid of molecular markers, which can be used for food traceability. To achieve this goal, 18 yellow fresh tomatoes and 16 processed market tomatoes were used to validate the selected molecular markers. Total genomic DNA was extracted from different tissues/matrixes: young leaves, fresh fruit, whole fruits preserved under water and salt, sliced fruits and juice, firstly using the CTAB method using a slightly modified protocol (Doyle and Doyle 1987). In order to clearly distinguish E40 from the other genotypes, a first CAPS marker (CAPS1) was designed starting from a private SNP for this genotype in the Phytoene synthase 1 gene (Solyc03g031860) previously reported by Terracciano et al. (2017). Since this marker only amplified DNA extracted from young leaflets, a second CAPS marker (CAPS2) was designed, which amplifies a smaller region of the Psy1 gene including the mutation. PCR amplified products were loaded in 1.2% agarose gels, visualized in the BioRAD transilluminator and then digested by using HphI restriction enzyme. Digested products were finally loaded and visualized in 3% agarose gels. PCR analysis performed with the CAPS1 marker used on leaves generated a fragment of 541 bp in all the samples tested. After digestion with HphI restriction enzyme, two fragments of 100 bp and 438 bp were produced from

E40 genotype, while three fragments of 100 bp, 210 bp and 228 bp were generated from the others genotypes. The amplified product obtained with the primer pairs CAPS2 using DNA extracted from fresh and processed tomato fruits resulted in one fragment of approximately 127 bp. Digestion of this products with HphI restriction enzyme did not produce any restriction fragment in the E40 genotype, while generated two fragments of 90 bp and 37 bp in the others ones. The use of the two CAPS markers designed allowed to clearly distinguish the genotype E40 from the others. In particular, the CAPS2 provides a suitable tool to trace the tomato supply chain from the field to the table, to prevent food fraud and to guarantee authenticity of products and the absence of any possible source of genetic contamination.