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TRADITIONAL AND MODERN FRESH MARKET TOMATO VARIETIES: TOWARD AN INTEGRATED SENSORY, HEDONIC, PHYSICOCHEMICAL AND GENETIC ANALYSIS

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Growing consumers complaint about the decline in flavor of fresh market tomatoes has aroused breeders' interest toward sensory quality. However, the complexity of many of the sensory traits and the lack of efficient selection criteria make their improvement a challenging task. In order to increase tomato fruit sensory quality and to diversify this product, further insights into the factors affecting tomato flavor and consumer preferences are required. For this purpose, in the framework of the European TRADITOM project (http://traditom.eu/), 17 traditional and modern fresh market tomato varieties (belonging to three typologies: "Oxheart", "Marmande" and "Round") were selected based on their reputation of good flavour, and different partially overlapping sets were cultivated and evaluated in France, Italy and Spain. In each country fruit quality was assessed at three levels using consensus protocols: sensory profiles by trained panels, hedonic and perceived sensory properties by consumers and physico-chemical measurements. For the hedonic tests, after the overall liking, consumers were asked to answer a Check-All-That-Apply (CATA) survey with 24 questions related to fruit appearance, flavor and texture.

Here we report the Italian results obtained on 12 varieties (7 traditional and 5 modern) belonging to the typologies "Oxheart" and "Marmande", grown under plastic tunnel, and evaluated at two different ripening stages: early ripening stage (BR) and red ripe stage (R). At the BR stage, sensory profiles and overall liking results highlighted a main genotype effect and only minor differences due to traditional vs. modern varieties comparison. Sensory results were supported by good correlations with physicochemical measures. Preference maps showed that, at the BR stage, the main direction of liking was mainly related to overall odor and flavor, tomato odor and flavor, sweet taste and pulpiness. Consumers' answers at CATA highlighted 20 and 9 attributes differentiating the products tasted at the BR and R stages, respectively. Correlations between overall liking and CATA attributes indicated highest relationships with the terms aromatic/strong aroma, nice aromatic tomato and sweet tomato. In order to model sensory descriptors and consumers' preferences/perceptions in relation to metabolite composition, metabolomic profiling is also being applied in collaboration with other partners of the project. In addition, expression profiling of key genes involved in tomato flavor are being carried out by qRT-PCR.

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