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Chitosan coating efficiently delays post-harvest ripening of tomato fruits

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Among the different approaches currently used to improve shelf life and prevent the gradual storage loss of nutraceutical quality after harvest, the use of edible coatings (ECs) has attracted increasing interest. ECs act as protective barriers controlling gas transfer reducing respiration and transpiration rates, lowering ethylene emission, sealing small wounds and inhibiting microorganism growth. ECs may be also employed as effective carriers of bioactive ingredients as vitamins, antioxidants, antimicrobial agents which increase the functional potential of the bio-based food coatings. Chitosan is a non-toxic, antimicrobial and highly biodegradable polysaccharide derived from deacetylation of chitin, the principal component of crustacean shells and of some fungi which has good film-forming capacity. The research was aimed to test the effectiveness of chitosan coating containing the apocarotenoid bixin in delaying the post-harvest ripening of tomato fruits. Ethylene emission, technological parameters and the content and profile of carotenoids and phenylpropanoids were determined during two weeks of storage at room temperature. Chitosan coating reduced ethylene emission of about 30-50% during the storage. In accordance with ethylene behavior, lycopene and β -carotene peak of accumulation was delayed of three-four days confirming the slower ripening rate of chitosan-coated fruits. Most phenyl propanoids were more concentrated in chitosan-coated fruits after one week of storage and similarly to what observed for carotenoids, caffeic and ferulic acids and quercetin showed a 3-days-delayed peak of accumulation in respect to control fruits. These results suggest that chitosan coating could be a valuable tool to prolong the shelf life of tomato fruits.

Biography

Castagna A graduated with honor in Biological Sciences, she obtained her PhD title at the University of Pisa, where she presently works at the Department of Agriculture, Food and Environment. She is involved in researches on the nutritional properties of plant food with a particular focus to the bio-protective secondary metabolites and the possibility to increase the shelf-life of fruits and vegetables and to promote accumulation of nutraceuticals by eco-friendly approaches. Another field of research deals with the evaluation of the possibility to valorize by-products of food technological process aimed to reduce wastes and to recover important sources as feed and food..

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