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Biopolymers-based active edible coatings to improve quality and safety of food products

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Biodegradable and edible biopolymers can be utilized as active coatings to control safety and enhance quality of food products. Edible coatings based on natural components respond to customer demands for safe and healthy approaches for food quality management and satisfy environmental concerns. Edible coatings may protect food products from physical, mechanical and microbial damages and also allows delivery of beneficial components. In our laboratory, we utilize advanced materials science approaches to develop highly effective, safe and applicable edible coatings based on biopolymers. Layerby- Layer (LbL) approach enables to control properties and functionality of materials. Natural polysaccharides-based coatings were implemented for various fresh fruits (melon, orange, mandarin, grapefruit and sweet pepper) by utilizing LbL method. The LbL coatings were combined with good adhesion of the inner poly-anion layer and beneficial activity of the outer poly-cation layer. The LbL arranged biopolymers resulted in significant elongation of product shelf life, since they slowed down tissue degradation, prevented development of hypoxic stress and off-flavors and effectively inhibited microbial spoilage. Nanoemulsions were utilized to incorporate active component into the edible coatings. Food-source citral, a natural antimicrobial and aroma agent was introduced in matrices of various biopolymers. The nano-emulsified active coatings were compared to those of the coarse-emulsified.

Biography

Elena Poverenov has completed her PhD in Organic Chemistry from Weizmann Institute of Science and Post-doctoral studies in Polymers and Material Chemistry from Weizmann Institute of Science. Since 2011, she is Research Scientist in the Institute of Postharvest and Food Sciences at Agricultural Research Organization, The Volcani Center. Her research group is implementing new advanced approaches from chemical science to improve quality and safety of food and agricultural products. She has published 30 papers in international journals including top journals, such as Nature and JACS and has been serving as an Editorial Board Member.

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