Effects of postharvest application of chitosan-based layer-by-layer assemblies on regulation of ribosomal and defense proteins in strawberry fruit (*Fragaria × ananassa*)

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Abstract

The application of a chitosan-based resistance inducer is regarded as a novel and effective strategy to elicit a defense response in strawberry fruit to protect against oxidative stress. However, the molecular mechanism behind chitosan-based inducers is not well understood. Strawberry fruits (*Fragaria × ananassa* Duch. 'Akihime') were coated by chitosan and carboxymethyl cellulose then packed into polyethylene terephthalate containers and stored for 8 d at 0 °C. In total, 161 differentially expressed proteins (fold change ≥ 1.30) were identified chitosan group compared to 362 in the uncoated control group. Comprehensive function enrichment analysis highlighted different protein modulation associated with protein metabolite processes. The metabolome study indicated the regulated abundance of some amino acids as well as the defense metabolites paralleled the proteomic analysis. The down-regulation of ribosomal proteins was observed in strawberries treated with both single-layer and layer-by layer elicitors. The proteomic output was verified using western blot and RT-qPCR for selected *ribosomal* genes. The present study demonstrates that layer-by-layer elicitors influence protein networks and highlights the potential role of ribosomal proteins in the modulation of plant immune response. The dynamic proteomics found in this study represent potential candidates to better understand plant-inducer interactions and plant immunity management.