The Effects of Lemon Peel Essential Oil Coating on quality of pacific white shrimp (*Litopenaeus vannamei*) stored at 4ºC

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Abstract:
Shrimps are nutritious food that are highly susceptible to microbial and physicochemical deteriorations, such as Shrimp melanosis (black spot). Sulphiting agents are widely used to prevent melanosis and microbial deterioration in shrimp; but the hazards related to sulphated foods, have created a necessity to find the effective natural alternatives. Lemon peel is the waste product of juice industry which is usually disposed in landfills or used as animal feed in small quantities. In the other investigation we observed the antityrosinase effect of lemon peel essential oil (LPEO) on shrimp. Essential oil application as food preservatives is often limited due to flavouring considerations. So by incorporation in coatings smaller amounts of EOs would be needed due to a gradual release on food surfaces, moreover nanoemulsions of EOs have more stability and efficiency. The objective of this study was to assess the combined effect of Lemon peel Nano EO (LPNEO) and carboxymethyl-cellulose (CMC) coating on improving postharvest quality of pacific white shrimp (*Litopenaeus vannamei*) during 10 days of storage at 4 °C. Shrimps were immersed in CMC (1%) and CMC (1%) containing 0.5% LPNEO (Shrimp:CMC ratio 1:1 w/v), while sodium metabisulfite (SMS) and water were used as positive and negative controls respectively. The lower rate of the increase in Enterobacteriaceae, mesophilic, psychrophilic and lactic acid bacterial counts were observed in shrimps treated with LPNEO. The increase in thiobarbituric acid level, total volatile basic nitrogen and trimethylamine content were retarted as well in these samples compared to the other groups. The lowest melanosis formation observed in LPNEO treated shrimps followed by CMC and SMS groups. Shrimps treated with LPNEO had also the significant higher sensory score for odor, color and texture. The results suggest that the LPNEO incorporated in CMC may be promising as a new eco-friendly preservative to extend the shelf life of shrimps during refrigerator storage.

Keywords: Carboxymethyl-cellulose (CMC), *Citrus limon* peel essential oil; Pacific white shrimp; Nano emulsion.

Professional Biography

Elham Nairi has completed her MSc at the age of 27 years from Food Technology Department of Shiraz University and performing her PhD in Technology of Food Science in Tabriz University. She was a Teaching Assistant in Sarvestan Azad University for 2 years and has been a research assistant in FAU University of Erlangen (Germany) since 2017. She has published 3 papers in reputed journals and presented one speech and 20 papers in valid congress.



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