

3<sup>rd</sup> International Conference on

# FOOD CHEMISTRY & NUTRITION

May 16-18, 2018 | Montreal, Canada

## Antimicrobial activity of grape seed and skin extracts coated on corona treated LDPE and PET films

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Consumer demand for ready-to-eat 'fresh' and safe food products with less synthetic preservatives together with well documented food-borne microbial outbreaks drive both research and food industry toward new innovative methods for microbial growth inhibition while keeping food freshness, quality, and safety. Incorporation of natural bioactive agents in the packaging material to increase the shelf life of meat products is a promising technology. Grapes are of special interest because of their high content of phenolic compounds that showed antimicrobial and antioxidant effects. The aim of the present work was to investigate grape seed (GSE) and skin (GSKE) extracts' antibacterial activity and developing bioactive LDPE/PET films that could be used as food packaging for poultry and meat products. Commercial corona treated LDPE and PET were coated with either grape seed or grape skin extract. Agar plate diffusion method was used for the investigation of the microbial properties of both extracts' coated films against *E.coli* as a Gram-negative bacterium and *Staphylococcus Aureus* as a Gram-negative one. LDPE and PET films coated with GSE showed inhibition zones of *E.coli* growth in the range of 16-25mm, while *Staph.Aureus* growth inhibition zones were in the range of 15-20mm. For LDPE corona films coated with grape seed extract, the minimum inhibitory concentration (MIC) was 0.002g/1cm<sup>2</sup> for *E.coli* and 0.003g/1cm<sup>2</sup> for *Staph.Aureus*. While for corona treated PET films/GSE, the MIC for both *E.coli* and *Staph.Aureus* was 0.002g/1cm<sup>2</sup>. Corona treated LDPE and PET coated with GSKE showed inhibition zone range of 13-16.3mm with *E.coli* and 12-20mm with *Staph.aureus*. For LDPE corona films/GSKE, the minimum inhibitory concentration (MIC) was 0.0009g/1cm<sup>2</sup> for *E.coli* and 0.003g/1cm<sup>2</sup> for *Staph.aureus*. While for corona treated PET films/GSKE, the MIC was 0.002g/1cm<sup>2</sup> for *E.coli* and 0.003g/1cm<sup>2</sup> for *Staph. Aureus*. The total phenolic content of both GSE and GSKE was determined using the Folin- Ciocalteu methodology to be 315.32g (GAE)/kg, and 265.326g (GAE)/kg for GSE and GSKE respectively. The coated films; LDPE/GSE or GSKE, were used to wrap fresh chicken fillets, TVC, Pseudomonads, Brochothrix thermosphacta, Lactic acid bacteria and Enterobacteriaceae counts were determined during the storage period; ten days for test samples and eight days for controls. Microbiological analysis for tested samples was done on day zero, two, four, six, eight, and ten, while for control till day eight. There was a reduction in the populations of the examined bacteria in the range of 0.2-1.4 log cfu/g in case of GSE, while with GSKE the reduction of bacterial populations range was 0.3-1.95 log cfu/g.

### Biography

Nahla Mohamed Abdel khalek Khalil has completed her MS in Food Chemistry at American University in Cairo, School of Sciences and Engineering, Chemistry Department. She is a Research Assistant at Chemistry Department, American University in Cairo. She intend to complete her research focusing on the other important characteristics of both grape seed and skin extracts e.g. anticancer and antiinflammatory.

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