Development and Evaluation of Antimicrobial Activity of Biodegradable Films Based on Galactomannan and Canola Oil Incorporated with Basil Essential Oil

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INTRODUCTION: The cell wall polysaccharides reservation, especially hemicelluloses as galactomannans, has been used widely as biodegradable polymer matrices films. Lipids as vegetable oil are used as additives in films to change the barrier properties. The incorporation of essential oils in films is highlighted as bioactive compounds associated with biodegradable packaging. **OBJECTIVES:** This study aimed to prepared films based on galactomannan (Gal) from *Delonix regia* seeds and Canola oil (CO) (*Brassica napus* L.) incorporated with Basil essential oil (BEO) (*Ocimum basilicum*) and to evaluate the antibacterial activity against pathogenic microorganisms. **MATERIAL AND METHODS:** The Gal was isolated by aqueous extraction, followed by ethanol precipitation. The films were prepared by the solvent evaporation method (*casting*) with GAL solutions 1% (w/v), CO 0.5% (w/v), BEO in different concentrations (2.5, 5.0 and 7.5 mg/mL) and characterized to the moisture content and optical properties (color and opacity). BEO was characterized by gas chromatography coupled to mass spectrometry (GC-MS); BEO isolated and the films were tested against strains *Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Salmonella choleraesuis*, *Staphylococcus aureus* and *Candida albicans* yeast by broth microdilution and inhibition zone method, respectively. **RESULTS AND DISCUSSION:** The BEO showed camphor (14.85%) and 1.8-cineole (3.48%) as the major components, minimum inhibitory concentration (MIC) ranging between 2.5 and 5.0 mg/mL and minimum bactericidal concentration (MBC) between 5.0 and 20.0 mg/ml. All the films showed low moisture content, low opacity and increase of lightness with values significantly different as higher concentrations of essential oil. *S. aureus*, *E. coli* and *P. aeruginosa* were sensitive to film (BEO 5.0 mg/ml) and showed halos of 14, 15 and 16.3 mm, respectively. **CONCLUSION:** The BEO promoted changes in physical and barrier properties of the films. BEO when incorporated into the film showed a moderate antimicrobial activity for potential application as bioactive packaging.

Key words: antimicrobial activity, essential oil, film.
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