

## **BIODEGRADABLE STARCH-BASED FILM INCORPORATED WITH VANILLIN AGAINST FOOD-CONTAMINATING BACTERIA**

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Natural phenolics can be excellent preservative agents in foods owing to their diverse bioactive activities against microorganisms. Edible film technology is a frequent approach for the development of bioactive compound-based natural products in current food preservation technologies. Our previous investigations revealed high antimicrobial effect of vanillin and cinnamic acid against spoilage microorganisms. Here, comprehensive microdilution assays were conducted to reveal the antimicrobial potential of these phenolics. This study also aimed at determining the antimicrobial efficacy of a starch-based film incorporated with phenolic compounds, specifically vanillin and cinnamic acid, against nine common foodborne pathogen and food spoilage bacteria, including *Escherichia coli*, *Staphylococcus aureus*, *Salmonella enterica*, *Pseudomonas putida*, *Pseudomonas aeruginosa*, *Bacillus subtilis*, *Bacillus cereus*, *Listeria monocytogenes*, and methicillin-resistant *Staphylococcus aureus*. Antimicrobial screening tests were set up in 96-well microtiter plates, while the casting method was used for preparation of the edible films containing phenolics. Vanillin demonstrated superior antimicrobial activity with a minimum inhibitory concentration of 2 mg/mL than cinnamic acid. In addition, vanillin exhibited the highest susceptibility against *E. coli*, *S. aureus*, *S. enterica* and *L. monocytogenes*. The inclusion of vanillin in the starch-based film exhibited a reduction in bacterial counts determined in 24-well microtiter plates compared to the control. Starch/vanillin films also demonstrated diminished bacterial colony numbers on solid media, emphasizing the potential of vanillin for enhancing the antimicrobial properties of starch-based films. The developed bioactive films can be a good basis for future food preservation technologies. This research was supported by the projects NKFI FK 134886 and TKP2021-EGA-28.