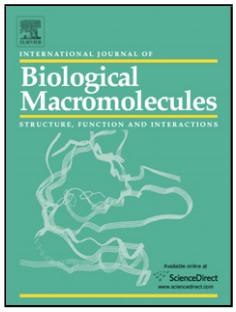

Title: Use of *Plantago major* seed mucilage as a novel edible coating incorporated with *Anethum graveolens* essential oil on shelf life extension of beef in refrigerated storage

Author: Behrooz Alizadeh Behbahani Fakhri Shahidi Farideh Tabatabaei Yazdi Seyed Ali Mortazavi Mohebbat Mohebbi

PII: S0141-8130(16)31791-3
DOI: http://dx.doi.org/doi:10.1016/j.ijbiomac.2016.10.055
Reference: BIOMAC 6635

To appear in: *International Journal of Biological Macromolecules*

Received date: 27-9-2016
Revised date: 3-10-2016
Accepted date: 17-10-2016

Please cite this article as: Behrooz Alizadeh Behbahani, Fakhri Shahidi, Farideh Tabatabaei Yazdi, Seyed Ali Mortazavi, Mohebbat Mohebbi, Use of Plantago major seed mucilage as a novel edible coating incorporated with Anethum graveolens essential oil on shelf life extension of beef in refrigerated storage, International Journal of Biological Macromolecules http://dx.doi.org/10.1016/j.ijbiomac.2016.10.055

Use of *Plantago major* seed mucilage as a novel edible coating incorporated with *Anethum graveolens* essential oil on shelf life extension of beef in refrigerated storage

Behrooz Alizadeh Behbahani, Fakhri Shahidi*, Farideh Tabatabaei Yazdi, Seyed Ali Mortazavi, Mohebbat Mohebbi

Department of Food Science and Technology, Ferdowsi University of Mashhad, P.O. Box: 91775-1163, Mashhad, Iran

Corresponding author: E-mail address: fshahidi@um.ac.ir (Fakhri Shahidi)

Highlights

- *Plantago major* seed mucilage (PMSM) extended the shelf life of beef.
- PMSM incorporated with *Anethum graveolens* essential oil extended the shelf life of beef.
- PMSM could be an effective coating material for beef.
- PMSM coatings suppressed bacteria and fungi growth in beef
- Thiobarbituric acid (TBA) and peroxide value (PV) correlated well with the microbiological data and sensory characteristics.

Abstract

In this study, *Plantago major* seed mucilage (PMSM) was extracted from whole seeds using hot-water extraction (HWE). The dill (D) essential oil components were identified through gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS) and its antioxidant properties were examined through the methods of 2,2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant potential (FRAP) and ß-carotene-linoleic acid assay (B-CL). Total phenolic content (TPC) was characterized through the Folin-Ciocalteu method and the antimicrobial effect was evaluated on 10 pathogenic microorganisms. PMSM edible coating incorporated were prepared in four different concentrations of essential oils, including 0, 0.5, 1 and 1.5% (w/w). The control and the coated beef samples were analyzed periodically for microbiological (total viable count,