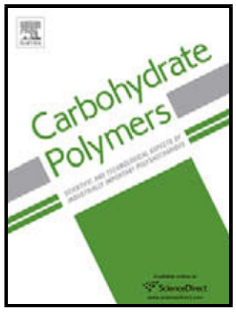

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PII: S0144-8617(17)30843-3
DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2017.07.067
Reference: CARP 12584

To appear in:

Received date: 18-5-2017
Revised date: 15-7-2017
Accepted date: 21-7-2017

Please cite this article as: Talón, Emma., Trifkovic, Kata T., Vargas, María., Chiralt, Amparo., & González-Martínez, Chelo., Release of polyphenols from starch-chitosan based films containing thyme extract.*Carbohydrate Polymers* http://dx.doi.org/10.1016/j.carbpol.2017.07.067

Release of polyphenols from starch-chitosan based films containing thyme extract

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Abstract

The release kinetics of thyme extract polyphenols (TE) from chitosan (CH), pea starch (S) and CH:S blend films in different solvents was evaluated, as well as their antioxidant activity in each release media. Pure starch films showed the fastest delivery rate and the highest delivery ratio of polyphenols, although the corresponding release media exhibied the lowest antioxidant capacity. TE provided CH based films with remarkable antioxidant activity, despite the lower polyphenol release obtained in all solvents, due to the strong polyphenols-chitosan interactions. The maximum amount of polyphenols delivered was found in the acetic acid solution, due to the high solubility of CH. The incorporation of tannic acid (TA) into CH films promoted cross-linking effect, which delays the TE release rate in water and ethanol aqueous solutions, except for CH:S:TA films. Thus, the polarity of the solvents and the polyphenols-matrix interactions markedly affected the polyphenol release and the antioxidant activity of the films.

Keywords: starch, chitosan, thyme, tannic acid, antioxidant activity, kinetics.