INCORPORATION AND QUANTIFICATION OF CARVACROL IN CHITOSAN FILMS

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Introduction. Chitosan and essential oils have been used as natural compounds to preserve the quality of different foods (1). Chitosan [N-acetyl-D-glucosamine and D-glucosamine] is a biopolymer nontoxic, bio-compatible and biodegradable. Moreover, is an excellent film-forming substance and biocompatibility with other substances (2). On other hand, carvacrol is a major component of essential oil of oregano and is recognized as a safe food additive. Carvacrol is volatile compound which can easily be decomposed during food processing. The incorporation of carvacrol into chitosan films is an alternative to extend its shelf life and retain its functional properties.
The objective of this work was to incorporate carvacrol into chitosan films by emulsion method.

Methods. Chitosan (128 kDa and 34% degree of acetylation) coating was prepared at 2% (w/v) and carvacrol was incorporated as emulsion: 0 (control), 0.5, 1.0, and 1.5% (v/v). Thereafter, the emulsions formed were poured on glass Petri dishes. The films were obtained by dry in an oven at 37 ºC during 24 h. Dried films were peeled from the plate and were utilized to evaluate the microstructural properties by Scanning Electron Microscoscopy (SEM). A films extract was obtained with 50 mg of film and 5 mL ethanol 50% (v/v). Theextract was injected into HPLC utilized a method reported by Du *et al*. (2008) (3). The results were expressed in percentage of recovery in films.

Results. Chitosan film only (control) shows an irregular surface with apparent absence of pores (**Fig. 1a**).

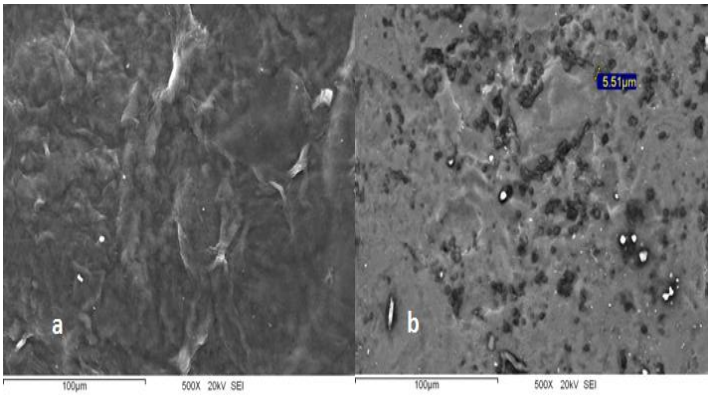

Fig 1. SEM pictures of chitosan film (a) and chitosan film with carvacrol 1.5% (b).

In changes on surface of chitosan film incorporated with carvacrol (**Fig. 1b**) we observed a smooth surface and presence of microcapsules with spherical forms with approximate size of 2-7 µm of diameter. The samples of extract films injected in HPLC confirmed the presence of carvacrol in the films incorporated. The recovery of carvacrol of films incorporated was of 47.2% at 48.2% (**Fig. 2**). This result suggests the presence of carvacrol in the microcapsules observed in SEM picture. Our result are higher to reported by Liolios *et al*. (2009) (4), they utilized a combination of emulsion and gelation ionic for encapsulation of carvacrol, where obtained 3-21% of recovery of carvacrol.

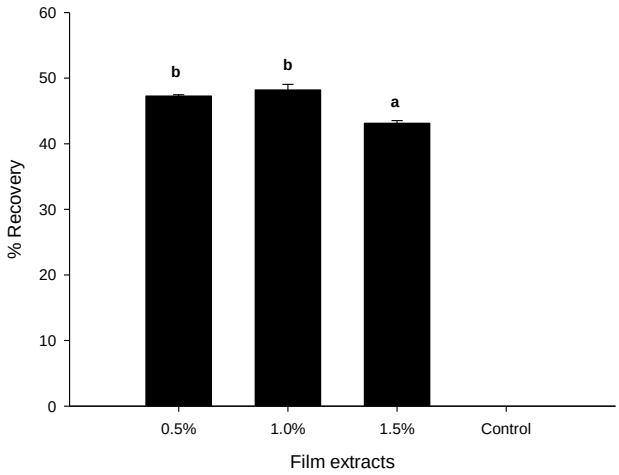

Fig 2 Percentage of carvacrol retention of films.

Conclusions. Our results indicate that is possible incorporated a high concentration of carvacrol in chitosan films by emulsion method.

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