

**Título: ANTIMICROBIAL ACTIVITY OF WHEY PROTEIN FILMS INCORPORATED WITH OREGANO ESSENTIAL OIL (*Origanum vulgare*)**

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**Resumo:**

The aim of this study was to evaluate the antimicrobial activity of whey protein films incorporated with different concentrations of oregano essential oil. Films were produced by casting technique from whey protein isolate and added of oregano oil at four concentrations: 0% (control film), 0.5%, 1.0% and 1.5% (v/v). The whey protein isolate was dispersed in distilled water, added with glycerol (3%) and heated at 90°C/30 minutes in water bath. The oregano oil was added to the solutions before heating. The film solution was spread on petri dishes (90 cm of diameter) and dried for 24 hours at room temperature. The films were removed from the plates with a spatula and stored at controlled humidity (52%) at 25°C/48 h before analysis. An inoculum of *Penicillium commune* was prepared from a pure strain. Circular discs (2.5 cm diameter) were aseptically placed onto the surface of solidified potato dextrose agar and inoculated with the test microorganism. The plates were incubated at 25°C/5 days. The diameter of the growth inhibition zones around the discs was measured and colony forming units (cfu/mL) were enumerated. The experiments were performed in triplicate and the results were evaluated by analysis of variance and Tukey's test at 5% significance. The mean concentration of *Penicillium commune* suspension was 5.5x10<sup>5</sup> cfu/mL. The addition of oregano oil caused no significant difference in the number of colonies and for all treatments was on average of 10<sup>5</sup> cfu/mL. Due to their heterogeneity, the inhibition zone was measured as the shortest distance between the film and closer colony. The inhibition halos ranged from 0 to 1.65 cm and increased with increasing oregano oil concentration. Films incorporated with 1.0% and 1.5% of oregano oil showed significantly higher inhibition halos than the control and 0.5% added films. There was no significant difference between the inhibition zone of films with 1.0 and 1.5% of oregano oil. Results showed that whey protein films incorporated with the oregano essential oil has potential of application as active packaging in the food and may prolong the shelf life of the products.

**Palavras-chave:** active film, whey protein, natural antimicrobial

**Agência de Fomento:** FUNADESP