

Potential Use of *Thymus mastichina* L. Extract as a Natural Agent against Cheese Spoilage Microorganisms

Authors : Susana P. Dias, Andrea Gomes, Fernanda M. Ferreira, Marta F. Henriques

Abstract : *Thymus mastichina* L. is an endogenous medicinal and aromatic plant of the Mediterranean flora. It has been used empirically over the years as a natural preservative in food. Nowadays, the antimicrobial activity of its bioactive compounds, such as essential oils and extracts, has been well recognized. The main purpose of this study was to evaluate the antimicrobial effect of *Thymus mastichina* ethanolic and aqueous extracts on pathogens and spoilage microorganisms present in cheese during ripening. The effect that the extract type and its concentration has on the development of *Staphylococcus aureus*, *Escherichia coli*, and *Yarrowia lipolytica* populations during 24 hours, was studied 'in vitro' using appropriate culture media. The results achieved evidenced the antimicrobial activity of *T. mastichina* extracts against the studied strains, and the concentration of 2 mg/mL (w/v) was selected and used directly on the cheese surface during ripening. In addition to the microbiological evaluation in terms of total aerobic bacteria, Enterobacteriaceae, yeasts (particularly *Y. lipolytica*) and molds, the treated cheeses physicochemical evaluation (humidity, a_w , pH, colour, and texture) was also performed. The results were compared with cheeses with natamycin (positive control) and without any treatment (negative control). The physicochemical evaluation showed that the cheeses treated with ethanolic extract of *Thymus mastichina*, except the fact that they lead to a faster water loss during ripening, did not present considerable differences when compared to controls. The study revealed an evident antimicrobial power of the extracts, although less effective than the one shown by the use of natamycin. For this reason, the improvement of the extraction methods and the adjustment of the extract concentrations will contribute to the use of *T. mastichina* as a healthier and eco-friendly alternative to natamycin, that is also more attractive from an economic point of view.

Keywords : antimicrobial activity, cheese, ethanolic extract, *Thymus mastichina*

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