

PP-207. Efficacy of parsley and celery essential oils against the growth of *Bacillus cereus* in commercial chicken soup

Zorica Stojanović-Radić¹, Niko Radulović², Milena Živković²

¹ Department of Biology and Ecology, Faculty of Science and Mathematics, University of Niš, Serbia

² Department of Chemistry, Faculty of Science and Mathematics, University of Niš, Serbia

Parsley (*Petroselinum crispum* (Mill.) Fuss) and celery (*Apium graveolens* var. *dulce* (Mill.) Pers.) are well known spices from the Apiaceae plant family, used in almost all corners of the world. The most frequent culinary use of these herbs is to improve or impart the flavor of/to soups and various sauces. On the other hand, as plant species with known antimicrobial properties [1, 2], they can be used for short-term conservation of these types of food. Up to date, efficacy of these spices in food models, which represent the only valid type of investigations related to food, was not investigated. *Bacillus cereus* is a foodborne pathogen, which grows at various temperatures (from 4 °C up to 50 °C, optimum at 30-37 °C) and produces several types of toxins [3]. In the case of ingestion of food heavily contaminated with this bacterium, severe diarrhoea and vomiting occurs as a consequence.

The goal of this study was set to investigate the potential of parsley and celery essential oils for prevention of soup spoilage caused by *B. cereus*. The essential oils were isolated from fresh plant material (leaves) and their chemical composition investigated by GC and GC-MS. The composition of the oils was in general agreement with those previously published for the two plant species [1, 4]. Minimal inhibitory concentrations (MIC) of both oils against two strains of *B. cereus* (an isolate from food and an ATCC strain) were primarily determined by a microdilution method. In order to find out whether the two oils exhibit the same effect on bacteria in an actual food system, commercial chicken soup was used as a model, and the effects of both essential oils in their MIC concentrations on the growth of *B. cereus* (food isolate) were evaluated. Influence of different storage temperatures (4, 18 and 37 °C), and different periods of cultivation with the essential oils was also investigated, where the bacterial number was monitored over a total cultivation period of 72 h. It was determined that the growth of the bacterium was significantly reduced at MIC concentrations of both oils in soup and that these oils can be used as very effective food spoilage preventing ingredients.

Acknowledgments

The authors acknowledge the Ministry of Education and Science of the Republic of Serbia for financial support (project number 172061).

References

1. O Nawel et al. (2014) Afr. J. Microbiol. Res.
2. KA Hammer et al. (1999) J Appl. Microbiol. 86: 985-990.
3. T Clavel (2004) J Appl. Microbiol. 97: 214-219.
4. IH Sellami (2012) J. Essent. Oil Res. 24: 513-521.