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Balkan Medical Union**



Balkanska Medicinska Unija



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Medical
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32eme SEMAINE MEDICALE BALKANIQUE - Nis, SERBIA

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P76 Swelling properties of *Lactobacillus casei* loaded whey protein-Ca-alginate microparticles

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Introduction. New approach for microencapsulation of *Lactobacillus casei* was employed in order to improve the viability of the probiotic and achieve targeted delivery in the lower intestine after oral administration. Optimal formulation of probiotic loaded whey protein-Ca-alginate microparticles was prepared, with the viability of the probiotic after preparation $10.55 \pm 0.21 \log_{10}$ cfu/g, d_{50} $8.65 \pm 1.02 \mu\text{m}$, zeta potential $-28.04 \pm 1.4 \text{ mV}$ and Ca-content $0.376 \pm 0.02 \text{ mg/10 mg}$.

Aim. To determine the swelling behavior of the optimal formulation of microparticles in mediums with different pH values respective to simulated gastrointestinal conditions.

Methods. The swelling properties of the microparticles were evaluated by measurement of the particle size in simulated gastrointestinal fluids with different pH values (1.5, 6.8 and 7.4, respectively). An exchange method was used to carry out the swelling test at 37°C. Percent of swelling was calculated according to $[(D_t - D_0)/D_0] \times 100$, where D_t and D_0 are mean volume diameters of the microparticles at time t and in the dry state.

Results. No significant tendency for swelling, especially in mediums with pH 1.5 and 6.8 was observed, where increase in d_{50} for 18.05% and 34.09%, respectively, was observed. Significant change in pH 7.4 was noticed, with increase in d_{50} for 41.76%, probably due to the ion-exchange, increased porosity and diffusion of the medium into the vicinity of the particles.

Conclusion. The low porosity and non-significant increase in particle size, especially in pH 1.5 and 6.8, point that the probiotic will be released in the lower intestine with the degradation of the microparticles as a dominant release mechanism.

Key words: *Lactobacillus casei*, swelling properties, whey protein-Ca-alginate microparticles

P77 Antioxidant activity of two species of the *Scrophularia* genus

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Introduction. Main characteristic of antioxidant compounds, mostly derived from the plant sources, is their ability to trap free radicals. Antioxidant compounds, like polyphenols and flavonoids, scavenge free radicals and thus inhibit the oxidative mechanisms that lead to harmful processes.

Aim. In order to reveal new sources of natural antioxidants, the antioxidant activity of the methanol extracts of two plant species from the genus *Scrophularia* L. collected in Serbia, *Scrophularia alata* and *Scrophularia canina*, was evaluated.

Methods. The methanol extracts were obtained from aerial part (stem, leaves and flowers) of the plant by hydrodistillation. The antioxidant properties of methanolic extracts have been determined by four *in vitro* methods: total antioxidant capacity, total phenolic level, flavonoids level, and DPPH (1,1-diphenyl-picrylhydrazyl) free-radical scavenging assay. Total antioxidant capacity have been evaluated by spectrophotometric phosphomolybdenum method assay. Content of total phenols have been determined by the spectrophotometric method with Folin-Ciocalteu reagent and flavonoid compounds level with ICl_3 .

Results. The higher amount of phenols [40.8 mg GA (gallic acid)/g] and flavonoids (10.75 mg RU (rutin)/g) was found in *S. alata* extract, while *S. canina* extract exhibited higher total antioxidant activity (57.1 mg AA (antioxidant activity)/g) and higher 2,2-diphenyl-1-picrylhydrazyl (DPPH) scavenger activity with $\text{IC}_{50} = 69.2 \mu\text{g/mL}$.

Conclusion. Extracts from both plants contain significant amount of compounds with strong antiradical properties, which might constitute a good source of natural antioxidants.

Key words: antioxidant activity, *Scrophularia alata*, *Scrophularia canina*