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The effect of phytoextracts obtained from *Cistus incanus* on the growth of lactic acid bacteria

Kornelia Kobryń, Marek Adamczak, Bartosz Brzozowski*

Department of Process Engineering, Equipment and Food Biotechnology, University of Warmia and Mazury in Olsztyn, Jan Heweliusz St. 1, 10-718 Olsztyn, Poland,

e-mail: bartosz.brzozowski@uwm.edu.pl

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Phytoextracts represent a rich source of bioactive compounds, including polyphenols. Plant extracts are characterized by notable antioxidant and antimicrobial properties. Polyphenols can effectively inhibit undesirable transformations in food, thereby extending its freshness. At appropriate concentrations, phytoextracts may also support the growth and viability of lactic acid bacteria. These bacteria can facilitate the fermentation of polyphenols, enhancing their bioavailability, generating novel intermediates, and increasing the total polyphenol content.

The aim of this study was to assess the impact of phytoextracts from Turkish rockrose (*Cistus incanus*), obtained via maceration using aqueous methanol solutions, on the growth and development of selected strains of lactic acid bacteria: *Lactobacillus acidophilus* 5e2, *Lb. sanfranciscensis* DSM20663, and *Lb. sanfranciscensis* DSM20451. The extraction yield was evaluated depending on the solvent used, and the concentration of polyphenols and their antioxidant activity in the extracts were determined. The highest extraction yield was observed for the sample extracted with water ($15.48 \pm 0.27\%$), while the lowest yield was recorded for the sample macerated with 99.8% methanol ($7.72 \pm 0.08\%$). Extracts obtained from *Cistus incanus* using a 50% aqueous methanol mixture contained the highest polyphenol content (0.93 mg/cm^3). The strongest antioxidant activity was exhibited by extracts obtained with both water and 99.8% methanol. The addition of *Cistus* extracts to the culture medium at concentrations ranging from 0.5% to 1% inhibited the growth of the studied bacterial strains. In contrast, the addition of *Cistus* extract in the concentration range of 0.005% to 0.1% stimulated the growth of *Lb. sanfranciscensis* DSM20663 and *Lb. sanfranciscensis* DSM20451.