



ISOLATION, IDENTIFICATION AND COMPARISON OF SOME PROPERTIES OF *LACTOBACILLUS DELBRUECKII* SUBSP. *BULGARICUS* STRAINS FROM TRADITIONAL BULGARIAN AND ITALIAN YOGURTS

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ABSTRACT

An important step in the development of successful technological schemes for production of yogurt and other functional foods is the selection of appropriate *Lactobacillus* strains with useful properties that are resistant to antibiotics and bacteriocins. In the present study eleven *Lactobacillus* strains were isolated from fourteen homemade Bulgarian and Italian yogurts. The isolates were identified as *Lactobacillus delbrueckii* subsp. *bulgaricus* (*L. bulgaricus*) by 16S rDNA sequence analysis. The results from comparative 16S rRNA gene sequence-based phylogenetic analysis revealed 92-99% pairwise similarity of the isolates to the reference *L. bulgaricus* strains. The antimicrobial activity, antibiotic susceptibility and nisin resistance of the isolated *L. bulgaricus* strains were examined. Bulgarian *L. bulgaricus* strains 3-BG, 5-BG and 8-BG were characterized by highest antimicrobial activity against the Gram-positive bacteria *Staphylococcus aureus* ATCC 25923, *Listeria monocytogenes* NBIMCC 8632, *Listeria ivanovii* ATCC 19119, *Listeria innocua* ATCC 33090, *Enterococcus faecalis* ATCC 19433 and *Enterococcus faecium* ATCC 19434. *L. bulgaricus* 8-BG was active also against the Gram-negative bacteria *Pseudomonas aeruginosa* ATCC 9027, *Proteus vulgaris* ATCC 6380, *Salmonella enteritidis* ATCC 13076, *Salmonella abony* NTCC 6017 and *Escherichia coli* ATCC 25922. In contrast, Italian *L. bulgaricus* strains demonstrated low antimicrobial activity. Bulgarian *L. bulgaricus* strains showed moderate sensitivity or resistance to most of the antibiotics used in the screening, while Italian *L. bulgaricus* strains were sensitive. Bulgarian *L. bulgaricus* strains 1-BG and 6-BG were resistant to 10 and 13 of a total of 24 antibiotics tested, respectively. Nisin resistance test showed that 10 of a total of 11 *L. bulgaricus* strains were highly sensitive to nisin (MIC values varying from 0.078 mg/mL to 0.156 mg/mL), except of Italian strain *L. bulgaricus* 6-IT which was resistant to nisin.