



KEY WORDS

- ✓ Lactic acid bacteria
- ✓ Starter culture selection
- ✓ Antibiotic resistance gene
- ✓ Bacteriocin biosynthesis gene
- ✓ EPS biosynthesis gene

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GENOTYPIC CHARACTERIZATION, ANTIMICROBIAL RESISTANCE, EXOPOLYSACCHARIDE, AND BACTERIOCIN PRODUCING GENES OF SOME LACTIC ACID BACTERIA ISOLATED FROM TRADITIONAL FOODS

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THESIS ABSTRACT

In this study, the genetic characteristics of Lactic Acid Bacteria (LAB) were examined to assess their suitability for use in starter culture selection. A total of 50 LAB strains isolated according to ISO 15214 standards were analyzed using MALDI-TOF MS and Ribotyping methods for species-level identification. Sequence analyses were then performed using NGS, and data quality control was conducted with the FastQC tool. After quality control, gene annotations for 35 selected strains were carried out using Geneious Prime. To detect antibiotic resistance gene regions, bacteriocin, and EPS-producing gene regions, the AMRfinder, BAGEL4, and antiSMASH tools were used. The study revealed that aminoglycoside, MLSB, and *vanC/vanD* type vancomycin resistance genes were common in *E. faecium* isolates, while *cacA-ENT1*, *eat(A)*, *msr(C)*, *tet(A)(60)*, and *vanR-N* genes were found in *L. delbrueckii* subsp. *bulgaricus*. *S. thermophilus* strains possessed various bacteriocin genes, including *mutacin IV*, *bovicin 255*, and *thermophilin A/B*, and also showed the presence of lincomycin, tetracycline, and vancomycin resistance genes. Additionally, gene regions related to EPS production were identified in three LAB species. These genetic analyses provide valuable information for the selection of LAB strains as starter cultures.

APPLICATION AREAS OF THE THESIS RESULTS

This study provided valuable insights into the antibiotic resistance, bacteriocin, and EPS production of lactic acid bacteria. However, the limitations of this study should also be considered. The study was conducted on a limited number of isolates, and these isolates were obtained from a specific geographic region (Marmara region). Broader studies should include more isolates and different geographic regions. Additionally, further research is needed to investigate the structural characteristics and functions of the relevant gene regions in more detail.

ACADEMIC ACTIVITIES (RESEARCH ARTICLES)

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