

Summary

Listeria monocytogenes is a dangerous human pathogen, transmitted primarily through the consumption of contaminated food. This species frequently colonizes food production environments, leading to food contamination. To eliminate bacteria, including *L. monocytogenes*, from production environments, disinfection procedures are carried out. Quaternary ammonium compounds, such as benzalkonium chloride, are commonly used for this purpose.

During the study, 380 bacterial isolates from the meat industry were collected, exhibiting colony morphology typical of the genus *Listeria*. Based on genetic identification methods (multiplex PCR and RFLP-PCR) and after analyzing biodiversity using the RAPD-PCR technique, 153 *L. monocytogenes* isolates were selected and used as the research material for further analyses. During the study, analyses of the genoserotype, antibiotic resistance, the presence of selected virulence-associated genes, sensitivity of isolates to benzalkonium chloride, and the presence of selected genes conferring resistance to quaternary ammonium salts were performed.

The isolates were classified in the genosertyping analyses as belonging to four different serogroups (IIa, IIb, IIc, and VIb), with serogroup IIa being the most common. All isolates were susceptible to the tested antibiotics, and in the case of ciprofloxacin 10 isolates exhibited reduced susceptibility, which, however, was not classified as resistance. All isolates possessed beta-hemolytic activity and 12 virulence genes. In the case of the *actA* and *inlB* genes, polymorphism of the length of PCR product was detected. The *ilsA* gene, was a differentiating gene for the collected isolates in the context of the presence of virulence genes and was detected in 18 of them. In 79 isolates (51.6%), reduced susceptibility to benzalkonium chloride was observed, and in 69 (45.1%) at least one of the tested genes (*bcrABC*, *emrC*, or *qacH*) conferring resistance to quaternary ammonium salts was detected. Isolates with reduced susceptibility to benzalkonium chloride had reduced susceptibility to ciprofloxacin more often than susceptible isolates. No relationship was found between susceptibility to benzalkonium chloride and serogroup or the presence of the *ilsA* gene.

The results indicate the need for continuous monitoring of the diversity and variability of *L. monocytogenes*.

Key words: food safety, genotypes, sensitivity

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