

Lactobacillus fermentum* AS A BIOCONTROL AGENT AGAINST FOODBORNE PATHOGEN *Listeria monocytogenes

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Overuse and misuse of antibiotics are major drivers for the emergence and evolution of antibiotic resistance in commensal and human pathogens. The spread of acquired antibiotic resistance in the environment mainly occurs via the food chain. The resistance of pathogenic bacteria to currently available antibiotics presents a possible challenge to human health. As a solution to this prevalent global issue, alternatives for antibiotics are in search, and biological control is at the forefront. *Listeria monocytogenes* is a foodborne human and animal pathogen that causes listeriosis, while *Lactobacillus* spp. are generally regarded as safe and possess the GRAS status. In this study, three strains of *Lactobacillus fermentum* (L-12, L-15, and L-18), previously isolated from spontaneously fermented buffalo milk from Kantale, Sri Lanka and molecular identification was carried out earlier, were tested *in vitro* for their possible biocontrol efficacy against *L. monocytogenes* (NTCT 11994). The antagonistic activity was screened using the agar well diffusion method. *Lactobacillus fermentum* supernatants were transferred to wells on *L. monocytogenes* agar plates containing BHI. Sterile MRS broth was used as the negative control. The experiments were conducted in triplicate, and the diameter of inhibitory zones was determined. All three strains of *L. fermentum* demonstrated antagonistic activity against *L. monocytogenes*. The antagonistic performance was highest in L-12, followed by L-18 and L-15, respectively. Strain L-12 had the highest mean zone diameter of 13.8 mm. Results showed that the antagonistic behaviour is highly strain-specific. *In vitro* study supports the possible usage of *L. fermentum* strains as biological control agents to inhibit *L. monocytogenes*. Further, fermented buffalo milk (buffalo curd) can be introduced as a functional food with a natural antibacterial effect.

Keywords: Antagonistic activity, Antibiotics, Biocontrol, *Lactobacillus fermentum*, *Listeria monocytogenes*