

ANTAGONISTIC ACTIVITY OF *Lactobacillus fermentum* AGAINST *Aspergillus* SPECIES OBTAINED FROM PASTEURIZED FRUIT SYRUP

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According to the WHO, a particular bacterium must possess specific characteristics to be considered a probiotic bacterium used in the food industry. Antagonistic activity against other microorganisms by producing antimicrobial substances is one such character. This study investigated the *in vitro* antagonistic activity of two naturally isolated *Lactobacillus fermentum* strains against spoilage of *Aspergillus* spp. isolated from pasteurized fruit syrup. *Lactobacillus fermentum* strains were isolated from spontaneously fermented buffalo milk. Molecular identification of *L. fermentum* (strain L-18 and T5d) and *A. foetidus*, *A. flavus*, *A. oryzae* and *A. elegans* was carried out by the authors previously. For the assay, each *L. fermentum* strain was streaked as one line in a modified MRS agar plate and incubated anaerobically at 37 °C for 48 h. A fungal agar block was placed on an incubated MRS agar plate, maintaining a distance of 2 cm from the *L. fermentum* streaked line and incubated aerobically at 28 °C for up to seven days. The area of the fungal mycelium in photograph images was transferred to square pixels using Adobe® photoshop C6 (13.0 - 64bit) software kit. The square pixels were then converted to square centimetres by using MS Excel 2019. The ability of antifungal activity by the two strains of *L. fermentum* was detected by comparing the growth area of each tested fungal mycelium corresponding to the same mycelium without the bacterium (positive control). Both *L. fermentum* strains showed positive antagonistic effects against all four tested *Aspergillus* species. Zero growth of *A. foetidus* indicated 100% control by both *L. fermentum* strains, while the growth of *A. elegans* was controlled close to 100%. *Aspergillus flavus* and *A. oryzae* were moderately controlled. The study identified two potential *in-vitro* antifungal *L. fermentum* isolates, exhibiting the benefit of consuming traditional buffalo curd and its potential to be used as a probiotic food source.

Keywords: Antagonistic effect, *Aspergillus* spp., Fermented foods, Food preservation, *Lactobacillus fermentum*