

Inhibitory Activity of Lactic Acid Bacteria on the Growth and Biogenic Amines Production by Foodborne Pathogens and Food Spoilage Bacteria

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Abstract : Biogenic amines are low molecular weight nitrogenous compounds that have the potential to accumulate in food, posing a significant risk to food safety and human health. In this study, we investigated the inhibitory activity of three strains of lactic acid bacteria (LAB), against the growth and production of biogenic amines by both foodborne pathogens and food spoilage bacteria. The foodborne pathogens studied included *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Salmonella Paratyphi*, while the food spoilage bacteria comprised *Enterobacter cloacae* and *Proteus mirabilis*. The methodology involved bacterial growth determination in petri dishes, bacterial culture extraction and derivatization, and biogenic amine analysis using HPLC. Our findings revealed that the inhibitory effects of LAB on these pathogens varied, with all three LAB strains demonstrating a remarkable reduction in the total bacterial count when combined with most pathogens, compared to the individual cultures of the pathogens. Furthermore, the presence of LAB in co-cultures with the pathogens resulted in a significant decrease in the production of tyramine and other biogenic amines by the pathogens themselves. These results suggest that LAB strains hold considerable promise in preventing the accumulation of biogenic amines in food products, thereby enhancing food safety. This study provides insights into the potential utilization of LAB in the context of preserving and ensuring the safety of food products. It highlights the significance of conducting additional research endeavors to elucidate the underlying mechanisms involved and to identify the precise bioactive compounds that are responsible for the observed inhibitory effects.

Keywords : food safety, lactic acid bacteria, foodborne pathogens, food spoilage bacteria, biogenic amines, tyrosine

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