



The First Report of Bacteriocin Production by the *Bacillus coagulans* IS-2 and its Antibacterial Effects

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Summary :

Bacillus coagulans is a probiotic bacterium with high beneficial effects on human health. The present research was performed to assess the antimicrobial effects of bacteriocin extracted from *B. coagulans* IS-2 against different food-borne bacteria. *B. coagulans* IS-2 was cultured on tryptic soy broth and incubated for 24 h at 37°C. Then, bacteria were sub-cultured on Man, Rogosa, Sharpe (MRS) broth. Produced bacteriocin was extracted from the MRS culture of *B. coagulans* IS-2 by 70% ammonium sulphate. *Escherichia coli*, *Salmonella enterica*, and *Listeria monocytogenes* were cultured on Mueller Hinton Agar. Then, two separate 6 mm wells were created and filled with 200 µL of extracted bacteriocin. Presence of growth inhibition zones around wells was considered as antimicrobial effect. The molecular weight of the bacteriocin was assessed by the Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). SDS-PAGE analysis showed presence of low molecular weight protein (<10 KD) in the gel which confirm the presence of bacteriocin-type protein. Clear growth inhibition zones occurred around the wells which contained bacteriocin for all *E. coli*, *S. enterica*, and *L. monocytogenes* bacteria, this directly confirmed the antimicrobial effects of bacteriocin produced by *B. coagulans* IS-2 toward *E. coli*, *S. enterica*, and *L. monocytogenes*. The study indicated an extracted bacteriocin had antimicrobial effects towards both Gram-negative (*E. coli* and *S. enterica*) and Gram-positive (*L. monocytogenes*) bacteria.
