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Bacteriocin—antibacterial activity of partially purified bacteriocin produced by Lactobacillus species against multi-drug resistant Gram-negative pathogens

Mahreen Ul Hassan[1], **Tayyab Ur Rehman**[2], **Hina Nayab**[2] and **Khayam Ul Haq**[2]
[1]Sheffield University, UK
[2]Khyber Medical University, Pakistan

Statement of the Problem: Multidrug resistant Gram-negative bacteria are the cause of nosocomial infections. Rapid increase of antibiotics confers bacteria to resist and survive antimicrobials. Certain species of lactic acid bacteria are reported that secrete ribosomally synthesized antimicrobial peptides called bacteriocins. These peptides recognize and kill target cells by rendering their membrane, permeable for various small molecules. The aim of this study was to investigate the potential of lactic acid bacteria to produce antimicrobial substances, especially against Gram-negative bacteria isolated from the hospital, searching for a new alternative to control the nosocomial infection.

Methodology & Theoretical Orientation: The bacteriocin was purified by two methods, amminosulphate precipitation method and organic solvent method. The physiochemical properties of partially purified bacteriocin were determined by pH, heat and ultraviolet light.

Findings: Two bacteriocin producing strains Lactobacillus plantarum and Lactobacillus helveticus were isolated from traditional yogurt, which showed wide-ranging inhibitory activity against Gram-negative bacteria (Acinetobacter baumanni and E.coli). Both bacteriocins were active at acidic pH. Exposure to UV light enhanced activity of the L. helveticus bacteriocin and had negligible effects on the L. plantarum bacteriocin. The L. plantarum bacteriocin was heat-stabile while L. helveticus bacteriocin was heat liable.

Conclusion & Significance: The study concludes that partially purified bacteriocin produced by Lactobacillus helveticus and Lactobacillus plantarum is found effective against the Gram-negative pathogens. It is considered significant because these antimicrobials could be purified and tested in vivo to further be utilized as a biocontrol agent could effectively control hospital acquired disease.

muhassan1@sheffield,ac,uk