

Inhibition of Food Borne Pathogens by Bacteriocinogenic Enterococcus Strains

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Abstract : Due to the abuse of antimicrobial medications in animal feed, the occurrence of multi-drug resistant (MDR) pathogens in foods is currently a growing public health concern on a global scale. MDR infections have the potential to penetrate the food chain by posing a serious risk to both consumers and animals. Food pathogens are those biological agents that have the tendency to cause pathogenicity in the host body upon ingestion. The major reservoirs of foodborne pathogens include food-producing fauna like cows, pigs, goats, sheep, deer, etc. The intestines of these animals are highly condensed with several different types of food pathogens. Bacterial food pathogens are the main cause of foodborne disease in humans; almost 66% of the reported cases of food illness in a year are caused by the infestation of bacterial food pathogens. When ingested, these pathogens reproduce and survive or form different kinds of toxins inside host cells causing severe infections. The genus *Listeria* consists of gram-positive, rod-shaped, non-spore-forming bacteria. The disease caused by *Listeria monocytogenes* is listeriosis or gastroenteritis, which induces fever, vomiting, and severe diarrhea in the affected body. *Campylobacter jejuni* is a gram-negative, curved-rod-shaped bacteria causing foodborne illness. The major source of *Campylobacter jejuni* is livestock and poultry; particularly, chicken is highly colonized with *Campylobacter jejuni*. Serious public health concerns include the widespread growth of bacteria that are resistant to antibiotics and the slowing in the discovery of new classes of medicines. The objective of this study is to provide some potential antibacterial activities with certain broad-range antibiotics and our desired bacteriocins, i.e., *Enterococcus faecium* from specific strains preventing microbial contamination pathways in order to safeguard the food by lowering food deterioration, contamination, and foodborne illnesses. The food pathogens were isolated from various sources of dairy products and meat samples. The isolates were tested for the presence of *Listeria* and *Campylobacter* by gram staining and biochemical testing. They were further sub-cultured on selective media enriched with the growth supplements for *Listeria* and *Campylobacter*. All six strains of *Listeria* and *Campylobacter* were tested against ten antibiotics. *Campylobacter* strains showed resistance against all the antibiotics, whereas *Listeria* was found to be resistant only against Nalidixic Acid and Erythromycin. Further, the strains were tested against the two bacteriocins isolated from *Enterococcus faecium*. It was found that bacteriocins showed better antimicrobial activity against food pathogens. They can be used as a potential antimicrobial for food preservation. Thus, the study concluded that natural antimicrobials could be used as alternatives to synthetic antimicrobials to overcome the problem of food spoilage and severe food diseases.

Keywords : food pathogens, listeria, campylobacter, antibiotics, bacteriocins

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