

RESEARCH ARTICLE

Competitive inhibition of *Staphylococcus aureus* in vacuum packed fish fillet by Lactic Acid Bacteria

S. CHOWDHURY, U. ROYCHOU DHURY AND K.C. DORA

ABSTRACT..... In the present study the influence of neutralized crude supernatant fluid (CSF) of isolated strain *Lactobacillus pentosus* FPTLB13 on *Staphylococcus aureus* ATCC 25923 inoculated vacuum packaged fish fillet was assayed. During the well diffusion agar test *L. pentosus* FPTLB13 inhibited the growth of *Staphylococcus aureus* ATCC25923, *Escherichia coli* MTCC 1563, *Pseudomonas aeruginosa* MTCC 3163, *Lactobacillus casei* MTCC 1423 and *Enterococcus faecalis* MTCC 2729. The neutralized CSF of *L. pentosus* FPTLB 13 showed an antimicrobial activity of 6400 AU/ml against *S aureus* ATCC 25923. The mode of action of the CSF of *L. pentosus* FPTLB 13 in combination with vacuum was found to be bacteriostatic with 2.37 and 2.9 log₁₀ cycles reduction in *Staphylococcus aureus* count at 6±1°C after 15 days and 10±1°C after 7 days, respectively. The antagonistic effect of CSF against *Staphylococcus aureus* ATCC 25923 on pomfret fillet indicated its usefulness in preservation and safety of different food items.

KEY WORDS..... Lactic acid bacteria, Bacteriocin, Vacuum pack, Crude supernatant fluid

HOW TO CITE THIS ARTICLE - Chowdhury, S., Roychoudhury, U. and Dora, K.C. (2012). Competitive inhibition of *Staphylococcus aureus* in vacuum packed fish fillet by Lactic Acid Bacteria. *Asian J. Animal Sci.*, 7(2) : 108-113.

ARTICLE CHRONICLE - Received : 23.08.2012; Revised : 15.09.2012; Accepted : 15.10.2012

Author for Correspondence -

K.C. DORA

Faculty of Fishery Sciences, West Bengal University of Animal and Fishery Sciences, Chakgaria, KOLKATA (W.B.) INDIA

Email: kc_dora@yahoo.co.in

See end of the article for **Copied authors'**

INTRODUCTION.....

Preservation of foods in a sound and safe condition remains an on-going challenge for humans. Food fermentation is a preservation technique that was developed by default using Lactic Acid Bacteria (LAB). Lactic Acid Bacteria plays an important role in food fermentations, causing the characteristic flavor changes and exercising a preservative effect on the fermented product. It is estimated that 25 per cent of the European diet and 60 per cent of the diet in many developing countries consists of fermented foods (Stiles, 1996). With the development of food industries, food processing moved from kitchen or cottage industries to large scale technological operations with increased need for food preservation. This stimulated use of food additives to preserve foods and enhance the quality. In recent years, consumers increasingly prefer foods that are of high quality, less severely processed (less intensive heating and minimal freezing

damage), less heavily preserved, more natural (free of artificial additives) and safer (Stiles, 1996). This has resulted in the emergence of a new generation of chill stored, minimally processed foods.

This shifts in consumer preference for minimally processed foods led to the increasing consumption of precooked food which is prone to temperature abuse. Thus, there is likelihood of an increased food-related illness and product spoilage (Ananou *et al.*, 2007). The use of LAB and/or their bacteriocins, either alone or in combination with mild physicochemical treatments and low concentrations of traditional and natural chemical preservatives, may be an efficient way of extending shelf life and food safety through the inhibition of spoilage and pathogenic bacteria without altering the nutritional quality of raw materials and food products. The use of LAB for food preservation is accepted by consumers as 'natural' and 'health promoting'. The only bacteriocin produced by LAB and currently used in food