

ABSTRACT

Isolation and Characterization of Bacteriocin and Lactic Acid Bacteria Isolated From Food Samples In Jamaica

Rachel Williams

In this study, 72 lactic acid bacteria were isolated from 14 different types of food and 45 of them were screened for antagonistic activity by deferred bacteriocin detection methods against a set of sensitive bacteria strains which included lactic acid bacteria, Listeria monocytogenes and Enterococcus faecalis. All of the Lactic acid bacteria isolated showed antagonistic activity towards one or more of the sensitive strains. Three of the isolates STC5-2, EC5-163 and SBB6-1 (were chosen for further studies) produced inhibitory substances in agar that was inactivated by trypsin but not by DNase, RNase or lysozyme. EC5-163 produced a stable bacteriocin in liquid medium, while SBB6-1 only weakly produced an unstable bacteriocin and STC5-2 did not produce any bacteriocin substance.

The bacteriocin produced by EC5-163 in broth was unstable or was inactivated in the presence of trypsin; however, it was stable at 65°C for 30 minutes and also between pH 4-10. The bacteriocin like substance was produced early in the growth cycle of the organism and when supernatant fluid containing bacteriocin was added to a culture of sensitive cells, it resulted in a decrease in the viable count of the sensitive strain.

The influence of sugars on bacteriocin production by deferred bacteriocin detection method in broth, resulted in no inhibitory substance being produced by STC5-2 and SBB6-1; however, EC5-163 produced bacteriocin with several sugars.

The plasmid profile by gel electrophoresis and protein profile by SDS PAGE of selected rods and cocoid lactic acid bacteria isolated showed the diversity of strains among the isolates. Plasmid profile for STC5-2 indicates that this strain has no plasmids, therefore the genetic information determining the production of bacteriocin is not plasmid mediated but chromosomal for STC5-2. In addition to their diversity, the protein profile also showed relatedness when compared to the known lactic acid bacteria.

The findings of this study indicate a proteaceous, inhibitory substance, that has potential to be used as a natural food preservative.