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Summary

A total of 171 isolates of lactic acid bacteria belonging to the genera, *Lactobacillus* (106), *Lactococcus* (53), *Leuconostoc* (6) and *Pediococcus* (6) were obtained from different sources including curd, chhana (acid-and-heat coagulated milk product), cheese, whey, rotten vegetables, putrid meat, putrid fish and silage. Only 24 of them were inhibitory against 19 strains of lactic acid bacteria as evaluated by agar spot test and well diffusion assay. Under conditions eliminating the effect of organic acids, hydrogen peroxide and bacteriophages, seven isolates of *Lactobacillus* showed antibacterial activity due to the exocellular production of bacteriocins, because this activity was lost when the culture supernatants were treated with proteolytic enzymes. An attempt was made to characterize crude bacteriocins and optimize their production with three producer strains of *Lactobacillus casei*. All the three bacteriocins were remarkably heat-stable and active over a wide range of pH. Treatment with many organic solvents did not cause any loss of activity. Comparisons between different growth media showed that semi-defined (SD)-MRS broth was most suitable for bacteriocin production. Maximum bacteriocin production was detected when the culture had passed the logarithmic phase of growth and when the culture was grown in SD-MRS broth with an initial pH of 6.5 at 32°C. No bacteriocin was produced at pH 8.0. Antibacterial activity was most pronounced on indicator cells at their logarithmic phase of growth, with 99% killing within 1.5 h. There was no activity on indicator cells which reached stationary phase of growth. The bacteriocins showed a bactericidal mode of action on indicator cells without causing cell lysis. The range of inhibitory activity was moderate, including a few food-borne pathogens such as *Bacillus cereus*, *Staphylococcus aureus* and *Enterococcus faecium*. Partial purification was achieved for *Lb. casei* W28 bacteriocin using gel filtration and anion-exchange chromatography. Molecular weight of the partially purified *Lb. casei* W28 bacteriocin, designated caseicin-W, was between 5 and 12 kDa.