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Optimization of bacteriocin production by *Lactobacillus* sp, a strain isolated from traditionally prepared curd

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Bacteriocin is an antimicrobial peptide produced by bacteria showing antibacterial activity against food spoilage organisms and pathogens. Production of bacteriocin by bacterial species is affected by the nutrient sources available and culture growing conditions. Therefore, experiments were carried out to determine the effect of pH, temperature, nitrogen sources, carbon sources, initial inoculums size, NaCl concentration, shaking speed, and incubation time on bacteriocin production by *Lactobacillus* sp. by agar well diffusion assay, where the diameter of the inhibition zone was measured. In a prospective series of experiments, when pH and temperature were statistically combined by a (5×4) factorial experiment, a significantly higher inhibition zone (15.59 mm) was observed at 30^{o}C and pH 5.5. Different combination of carbon sources (glucose, sucrose, lactose, maltose, starch, finger millet flour and unpolished rice flour) and nitrogen sources (peptone, yeast extract, soybean flour, green gram flour, black gram flour and lentil flour) with different concentration (10 g/L, 20 g/L and 30 g/L) were analyzed by a factorial experiment (3×3). The combination of maltose (30 g/L) and soy bean (20 g/L) significantly increased the bacteriocin production by *Lactobacillus* sp. where 18.27 mm of mean inhibition zone was observed. Effects of initial size of the inoculum, NaCl concentration, shaking speed and incubation time on bacteriocin production were analyzed by the one-factor-at-a-time (OFAT) method and Ducan's multiple range test. All the parameters tested by the OFAT method significantly affected the bacteriocin production, whereas shaking speed created a negative effect on bacteriocin production by *Lactobacillus* sp. A significantly higher inhibition zone (34.46 mm) was obtained in maltose (30 g/L) and soy bean (20 g/L) broth at pH 5.5 and inclusion of 1% NaCl, where the initial inoculum level was maintained as 1.2 × 106 cfu/ml and incubated at 30^{o}C for 4 days, and it was 2.35 fold higher than the inhibition zone obtained in MRS broth at 30^{o}C and pH 6.2 (14.65 mm). This study concludes that significantly higher bacteriocin production from *Lactobacillus* sp. isolated from traditionally prepared curd can be obtained in maltose soy bean broth substituted with 1% NaCl at pH 5.5, where the initial inoculum level was maintained as 1.2 × 106 cfu/ml and incubated at 30^{o}C for 4 days.

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