



INHIBITION GROWTH OF *LISTERIA MONOCYTOGENES* STRAINS BY BLIS FROM *LACTOBACILLUS CURVATUS* QC38

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Introduction. *Listeria monocytogenes* is a Gram-positive, facultative anaerobic, non-spore-forming, rod-shape bacteria which is an opportunistic intracellular pathogen that cause listeriosis in humans. The disease is a common food-borne infection and usually occurs in high-risk groups, including pregnant women, immunocompromised individuals, the elderly and neonates (1). Bacteriocin like inhibitory substances (BLIS) are ribosomally synthesized peptides with antimicrobial properties. BLIS are produced by a broad variety of microorganisms especially lactic acid bacteria, these antimicrobial peptides could be used as natural preservatives instead of chemical preservation in food industry (2).

The aim of this study was to evaluate the antimicrobial activity of BLIS produced by *Lactobacillus curvatus* QC38 isolated from cotija cheese against *Listeria monocytogenes* strains.

Methods. The bacterial strain *L. curvatus* QC38 isolated from Cotija cheese was inoculated into MRS broth at 37°C for 24 h. Bacterial cells were removed by centrifugation and supernatant activity was measured by agar well diffusion assay (AWDA) using *L. monocytogenes* ATCC 19115 as reference strain (3). Supernatant of *L. curvatus* QC38 was concentrated by centrifugation using centricons with a MW cutoff of 3 kDa and 10kDa obtaining 3 fractions (F1: larger than 10kDa, F2: between 10 and 3 kDa, and F3: smaller than 3kDa). Cell free supernatant (CFS) and the 3 fractions obtained from ultrafiltration of *L. curvatus* were evaluated for thermal stability, sensitivity to proteolytic enzymes (proteinase K, pronase E and α -chymotrypsin) and extender storage at 4 and -20°C during 5, 10, 15 and 20 days. The antimicrobial activity was measured by AWDA as describe above. Strains of *L. monocytogenes* isolated dairy products were also tested.

Results. A lactic acid bacteria identified as *Lactobacillus curvatus* QC38 was isolated from artisanal Cotija cheese from Michoacan. CFS of this strain showed antimicrobial activity against *L. monocytogenes* ATCC 19115. Fractions F1 and F2 showed inhibitory activity against *L. monocytogenes*, while F3 did not show any antimicrobial activity. CFS and the 2 active fractions (F1 and F2) were incubated at 90°C, and also were treated at 121°C, 15 psi during 15 min, kept at 4 and -20°C during 5, 10, 15 and 20 days, antimicrobial activity against *L. monocytogenes* was measured by AWDA.

Results showed that CFS and the two fractions maintained the inhibitory activity yet after of thermal process.

BLIS were resistant to pronase E and α -chymotrypsin but sensitive to proteinase K. CFS and the two fractions were tested against isolates of *Listeria* obtained from dairy products like cheese and ice cream (20 *L. monocytogenes*, 2 *L. welshimeri*, 1 *L. ivanovii*, and 2 *L. grayi*). Results showed that the CFS and the two fractions inhibited specifically *L. monocytogenes* but no other species.

Conclusions BLIS produced by *L. curvatus* QC38 may possess potential practical applications due to the fact that were able to inhibit the growth of *L. monocytogenes* strains isolated from dairy products. BLIS were not affected by thermal process or extended storage.

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