

TITLE: ENHANCEMENT OF BACTERIOICIN PRODUCTION BY *Lactobacillus sakei* MBSA1 USING CO-CULTURES WITH OTHER LACTIC ACID BACTERIA

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ABSTRACT:

Lactic acid bacteria (LABs) are able to produce antimicrobial peptides (bacteriocins) that are active against several microbial species with interest in foods. Quorum sensing has been studied to explain the communication between bacteria, but the involvement of quorum sensing in bacteriocin production is poorly understood. In this study, bacteriocinogenic *Lactobacillus sakei* MBSa1, isolated from a Brazilian meat product and active against several Gram positive bacteria, was used to generate data on how production of bacteriocin can be stimulated or induced by other bacteria in the same menstruum. *Lb. sakei* MBSa1 was inoculated in MRS broth and mixed with cultures of *Enterococcus faecium* S100, *Enterococcus faecalis* ATCC 12755 or *Lactobacillus sakei* ATCC 15521 after 2, 4, 6, 8, 10, 12 and 24 h at 30°C. The mixtures were kept at 30°C for additional 24h, and the amount of bacteriocin in the supernatants, obtained after centrifugation, was measured by the agar-well diffusion method using *Listeria monocytogenes* Scott A as indicator of activity. Results were expressed as AU/ml. Additionally, the supernatants of each co-cultures were added to fresh cultures of *Lb. sakei* MBSa1 in MRS broth and the amount of bacteriocin measured after 24h at 30°C. Proper negative controls were included in all tests. Results indicated high amount of bacteriocin as early as 2h after the addition of *E. faecium* S100 to the culture of *Lb. sakei* MBSa1. The amounts of bacteriocin measured after 2, 4, 6, 8, 10, 12 and 24 h were 6400, 12800, 6400, 6400, 6400, 800 and 100 AU/mL respectively, while production of bacteriocin by *Lb. sakei* MBSa1 alone was detectable only in 24h. The same occurred when the co-cultures supernatants were added to the *Lb. sakei* MBSa1 culture in MRS broth. These results suggest that a quorum sensing mechanism may be involved in the induction of bacteriocin production, stimulating the continuation of this research project.

Keywords: lactic acid bacteria, bacteriocin, quorum sensing

Funding Agents: FAPESP (13/07914-8) and CNPq.