

Safety and beneficial properties of bacteriocinogenic and putative probiotic strain *Latilactobacillus sakei* subsp. *sakei* 2a

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Representatives from the species *Latilactobacillus sakei* are known for their beneficial probiotic properties and health benefits. Found naturally in fermented foods and the human gut, *Ltb. sakei* plays a crucial role in maintaining a balanced intestinal microbiota. This balance is essential for proper digestion, nutrient absorption, and overall gut health. Strains belong to the species *Ltb. sakei* has been shown to inhibit the growth of pathogens and spoilage bacterial species, thereby reducing the risk of infections and promoting a healthy immune system. Additionally, for some strains belong to the species, anti-inflammatory properties that can help alleviate symptoms of gastrointestinal disorders such as irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD) were suggested. The use of strains belong to the species of *Ltb. sakei* as a probiotic supplement supports digestive health, enhances immune function, and contributes to overall well-being. Its natural origin and safety profile make it an excellent choice for those seeking to improve their gut health through probiotics.

In current work, we have investigated some of the probiotic features and safety of the bacteriocin-producing *Latilactobacillus sakei* subsp. *sakei* 2a isolated from *linguça*, a traditional Brazilian sausage.

The effect of selected commercial drugs from different generic groups and antibiotics on the growth of *Ltb. sakei* subsp. *sakei* 2a was also determined. The presence of virulence factors was determined based on PCR with total DNA from *Ltb. sakei* subsp. *sakei* 2a. Good growth of *Ltb. sakei* subsp. *sakei* 2a was recorded in MRS broth supplemented with 0.2% or 0.4% oxbile or in MRS broth adjusted to a pH from 5.0–9.0. Auto-aggregation of *Ltb. sakei* subsp. *sakei* 2a was 62.59%. Different levels of co-aggregation were recorded between *Ltb. sakei* subsp. *sakei* 2a and *Enterococcus faecalis* ATCC19443, *Ltb. sakei* ATCC15521 and *Listeria monocytogenes* ScottA. Growth of *Ltb. sakei* subsp. *sakei* 2a was not inhibited by commercial drugs from different generic groups. The inhibitory effect on the growth of *Ltb. sakei* subsp. *sakei* 2a was recorded only in the presence of Arotin [selective serotonin reuptake inhibitor antidepressant] Minimal Inhibition Concentration (MIC) 1.0 mg/mL, Atlansil [Antiarrhythmic] MIC 0.625 mg/mL, Diclofenac potassium [non-steroidal anti-inflammatory drug (NSAID)] MIC 2.5 mg/mL and Spidufen [NSAID] MIC 15.0 mg/mL. Only two antibiotics tested in this study, Amoxil and Urotrobel, inhibited the growth of *Ltb. sakei* subsp. *sakei* 2a with a MIC of < 0.5 mg/mL and 5.0 mg/mL, respectively. However, *Ltb. sakei* subsp. *sakei* 2a generated positive PCR results on the DNA level for *vanA* (vancomycin resistance), *hyl* (hyaluronidase), *esp* (enterococcal surface protein), *ace* (adhesion of collagen) and *cilA* (cytolysin) and a high virulence profile when examined for the presence of virulence factors. It is important to underline that cytolysis has been described as a virulence and antibacterial factor.

References

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International Symposia

Beneficial Microbes

March 27th and 28th, 2025

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Biotechnological Tools to Control *Listeria monocytogenes* Biofilms in Food Processing Facilities. *Mol Biotechnol.* 2018 Sep;60(9):712-726.

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Acknowledgements: This research was partially supported by the Centre for Research and Development in Agrifood Systems and Sustainability, funded by FCT (UIDB/05937/2020 and UIDP/05937/2020), Fundação para a Ciência e a Tecnologia, Portugal; by FAPESP, processo 2023/05394-9, Sao Paulo, SP, Brazil.