

Selection of functional lactic acid bacteria strains through millet bran fermentation.

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● Fermentation represents a sustainable approach to exploiting agro-industrial by-products. Millet bran, the by-product of the millet processing industry, contains an abundance of nutritious components, however, it remains underused. Hence, the research aimed to select functional lactic acid bacteria (LAB) strains to valorise millet bran. Millet bran was mixed with water and subjected to daily refreshments for seven days. The acidification was very limited (pH over 6), and LAB were detected, but they were not the dominant population, ranging from 10⁴ CFU/g to 10⁶ CFU/g. Among the isolates, thirteen LAB strains were characterised by RAPD-PCR, and identified through 16S rRNA gene sequencing. *Weissella paramesenteroides* was the dominant species. Several technological and functional properties of the strains were assessed. Acidification and growth capacity were determined by inoculating the strains in millet bran dough and millet bran enriched with glucose. The addition of glucose enhanced LAB activity, decreasing the final pH below 4 in most samples. Chemical analyses highlighted efficient glucose depletion and organic acid production of *W. paramesenteroides* MIL10 and *Lactococcus lactis* MIL42. Exopolysaccharide production was detected exclusively in *W. paramesenteroides* MIL46 strain. Concerning functional properties, the screening revealed strains capable of increasing the phenolic content and antioxidant capacity in doughs obtained with millet bran. The γ -Aminobutyric acid production was quantified through *in vitro* test, identifying strains with promising biofunctional properties. Millet bran fermentation represents an effective tool for isolating LAB strains with health-promoting potential, supporting future applications in producing fermented foods from plant by-products.

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