



Abstract

# Selection of Promising Exopolysaccharide-Producing Starter Cultures for Gluten-Free Sourdough <sup>†</sup>

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**Abstract:** Celiac disease is an autoimmune enteropathy that affects the small intestine and is caused by the gliadin fraction of wheat gluten and other alcohol-soluble proteins (prolamines) of barley and rye in genetically predisposed subjects. Nowadays, the only recognized cure for this pathology is the use of gluten-free (GF) products. Although the market for GF products has grown in the last few years, their improvement is still a challenge for the food industry. With regard to GF bakery products, some of them can result in an unappetizing taste with a high fat content. These inconveniences can be minimized or solved by using sourdough fermentation. Sourdough is a stable culture of lactic acid bacteria (LAB) and yeast in a mixture of flour and water. In particular, GF sourdough represents a rich source of naturally occurring LAB and wild yeasts, which play important roles in food fermentation. This is mainly due to their potential in improving functional, technological, and probiotics properties, contributing to safe food with a better taste. Moreover, exopolysaccharide (EPS)-producing strains can also contribute to improving the sensory and rheological quality of the different GF products. This study aims to isolate and characterize the microbial pool from a GF sourdough made with rice flour and to evaluate the ability of selected LAB strains to produce exopolysaccharides (EPS). The yeast and LAB were isolated in selective agar media. A total of 220 isolates (110 yeasts and 110 bacteria) were obtained. They were taxonomically identified and characterized using both traditional and molecular approaches. Sequencing analysis of the D1/D2 domain of the 26S rRNA and the 16S rRNA genes, for yeasts and bacteria, respectively, revealed the occurrence of *Saccharomyces cerevisiae* as predominant yeasts and *Lactiplantibacillus plantarum* and *Pediococcus pentosaceus* as dominant LAB. Regarding the EPS production, 25 strains were able to produce dextran-like EPS with a maximum yield of 2 g/L. This study allowed the isolation and selection of promising EPS-producing starter cultures for the different types of flour sourdough, in particular, GF sourdough.

**Keywords:** sourdough; EPS; lactic acid bacteria



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