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MICROBIOLOGIA
APLICADA**

ANAIS

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Editado por

Andreza Francisco Martins

Amanda de Souza da Motta

Patricia Valente da Silva

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BACTERIAL DIVERSITY IN SOURDOUGH: STEPS FERMENTATION ANALYSIS

Letícia da Fontoura Xavier Costa¹, Caroline Isabel Kothe², Tiela Trapp Grassotti¹, Beatriz Nagel Sandoval¹, Michele Bertoni Mann¹, Jeverson Frazzon¹, Roberta Cruz Silveira Thys¹, Ana Paula Guedes Frazzon¹

(engleticiaxavier@gmail.com)

1 – Universidade Federal do Rio Grande do Sul (UFRGS). Porto Alegre, RS, Brasil.

2 – Université Paris-Saclay, INRAE, AgroParisTech, Micalis Institute, 78350 Jouy-en-Josas, France.

Sourdough bread is a bakery product, which provides a delicious sensory experience to consumers. The flavor has been associated with acid production by species of lactic acid bacteria present in raw material. However, studies evaluating the composition and variation of other microorganisms during fermentation steps of sourdough are scarce. Therefore, the present study aimed to evaluate the bacterial community present in whole wheat flour sourdough from a time between zero to 216 hours of fermentation. According to the manufacturer's instructions, total DNA from 0, 120, 168 and 216 hours of sourdough fermentation were extracted using EZNA kit (Bio-Tek). The V4 region from the *16S rRNA* gene was amplified by PCR and sequenced using Illumina MiSeq. The quality-filtered sequences were imported into the Find Rapidly OTUs with Galaxy Solution (FROGS) pipeline to obtain the Operational Taxonomic Units affiliated with SILVA 132 SSU databases. The dominant families found in all samples were Erwiniaceae, Enterobacteriaceae, Leuconostocaceae, Lactobacillaceae, Clostridiaceae, and Acetobacteraceae. The results indicated that Erwiniaceae (32.9%) and Enterobacteriaceae (49.4%) were persistent during fermentation steps (zero to 120 hours). Enterobacteriaceae remained for more time during sourdough steps, probably, because this family is tolerant to acid stress of organic acids produced during fermentation. Clostridiaceae was observed only in the sample from 120 hours (3.0%), and Leuconostocaceae in samples from 120 (11.3%) and 168 hours (0.3%). Lactobacillaceae and Acetobacteraceae were found in samples collected from 120 (83.8% and 1.3%), 168 (82.4% and 17.1%) and 216 (62.8% and 36.9%) hours, respectively. These families' predominance in sourdough indicated that the environment acidity favours the prevalence of lactic acid and acid-producing bacteria. Thus, as the fermentation time increases, the diversity of microorganisms present in the process reduces. Therefore, our data suggest that a lower diversity found in mature sourdough occurred in a longer fermentation time (216 hours) due to the organic acid formation. The longtime fermentation in bakery products using sourdough has already been approached as a food preservative to prevent contamination and increase its shelf life. These results confirmed this statement since reducing contaminants due to a decrease of microorganism diversity was observed with an increase of fermentation time during a sourdough production.

Keywords: sourdough, microbiome, new generation sequencing, whole wheat flour.

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