

Optimisation of important processing conditions for rice bran sourdough fermentation using *Lactobacillus plantarum*

ABSTRACT

The potentials of rice bran sourdough in bread making are recently gaining popularity. However, there is no information on the influence of processing conditions on the quality attributes of rice bran sourdough. To investigate the influence of fermentation time and temperature on the levels of acidity (pH and TTA) in rice bran sourdough fermented with *L. plantarum*, we applied response surface methodology (RSM). Furthermore, we studied the effect of different fermentation time and temperature on the total phenolic and volatile compounds in the sourdough. GC/MS measurements for the evolution of aroma volatile compounds (VOCs) in the rice bran sourdoughs were conducted. The higher and longer the fermentation temperature and time, the higher the acidity levels in the sourdoughs. Fermentation temperature and time do not have a significant effect on the total phenolic sourdough contents. Forty-seven VOCs were detected in the rice bran sourdoughs. The major VOCs were acetic acids, ethanol, 2-Methoxy-4-vinylphenol, Hexadecanoic acid, 1-(hydroxymethyl)-1,2-ethanediyl ester, acetoin, and 2-methoxy-Phe-nol. The sourdough fermented at 35°C for 13 ho contained the largest number (27) of aroma compounds and had the highest acidity. These fermentation conditions are close to the optimal parameters (temperature – 33°C, duration – 12.5 hours), obtained as a result of applying RSM for rice bran fermentation. Thus, high quality bran sourdough can be produced at the temperature of 33°C for 12.5 hours. The results of this study will be useful to produce a quality rice bran sourdough bread with appealing aroma and a long shelf-life.

Keyword: Rice bran; Acidity; Response surface methodology; *Lactobacillus plantarum*; HS-SPME; GC/MS; Volatile compounds