ABSTRACT

The Satho or rice wine fermentation process is generally divided into 2 steps: saccharification and liquid stage fermentation. Both involve several types of microorganisms. Previously, the cultivation method is commonly used to study microorganisms in the Satho fermentation process. Recently, the technique of denaturing gradient gel electrophoresis (DGGE) is introduced to assess complex microbial populations without cultivation. The objective of this study is to investigate the microbial community in the Satho fermentation process by the DGGE technique. Satho fermentation was performed in a laboratory following the traditional method for a period of 10 days. Satho samples from various times of fermentation were subjected to chemical analysis by HPLC and GC and microbial community assessment by cultivation and DGGE approaches. The Satho with good chemical profiles: high ethanol concentration (107.7-114.7 g/L), low amounts of glucose at the end of fermentation (less than 2.0 g/L) and low lactic acid concentrations (less than 7.3 g/L) were compared with the poor one. It was found that 6 microorganisms were discovered by DGGE and 2 of them were predominates throughout the fermentation process in both types of Satho. Whereas, in the cultivation approach, Pediococcus sp. and Bacillus sp. were observed. For fungi and yeasts, 6 microorganisms were detected in the DGGE Satho with good chemical profiles by DGGE and 3 of them were prominent showing the same migration as the identification ladders: Amylomyces rouxii, Saccharomyces cerevisiae and Saccharomycopsis fibuligera. On the other hand, only S. cerevisiae was not found in the Satho with poor chemical profile. These 3 microorganisms were also found by the cultivation approach. The confirmation of the identification of microorganisms analyzed by DGGE should be carried out. This study demonstrated that DGGE could be applied to identify microorganisms in Satho fermentation.

KEY WORDS: MICROBIAL COMMUNITY/ DENATURING GRADIENT GEL ELECTROPHORESIS (DGGE)/ ALCOHOLIC FERMENTATION/ RICE WINE/ SATHO