

学 位 論 文 要 旨	
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題 目	Effect of solid-state saccharification processes on the flavor of rice-flavor baijiu (固体糖化工程が小曲米酒の風味に与える影響)
<p>The manufacturing processes of Chinese traditional distilled spirit “rice-flavor baijiu” and Japanese traditional distilled spirit “awamori” are very similar. It must become very important knowledge to understand the characterization of both liquors for revealing with the introduction and the development of the manufacturing techniques. Rice-flavor baijiu making begins from the solid-state saccharification (SSS) in which xiaoqu (the fungal and yeast starter) and steamed rice are mixed incubated at 30–35°C for 24–48 hours. Then, it adds water and ferments in the liquid state. It is reported that SSS is an essential process for alcohol fermentation to be proliferated <i>Rhizopus</i> sp. and to be produced starch hydrolysis enzymes by <i>Rhizopus</i> sp. This SSS is a unique process of rice-flavor baijiu making that is not found in awamori making and might be affected the characteristic flavors between both liquors. In this study, it was aimed to reveal the effect of SSS process on the flavor of rice-flavor baijiu.</p> <p>I prepared two rice-flavor baijiu; one was prepared by an authentic process including SSS. The other was prepared without w/o SSS. By comparison, rice-flavor baijiu with SSS contained a higher concentration of β-phenethyl alcohol, ethyl lactate, and acetic acid which are recognized as the characteristic compounds in rice-flavor baijiu than rice-flavor baijiu without SSS. It was confirmed that the increased <i>Rhizopus</i> sp. during SSS produced a large amount of protease and supplied phenylalanine to the mash and β-phenethyl alcohol production by the yeast will be accelerated. In addition, <i>Rhizopus</i> sp. produced a lot of lactic acid during SSS and lactic acid promoted the acetic acid production by yeast under acid condition. A large amount of lactic acid in the mash could prevent contamination by decreasing mash pH.</p> <p>I compared rice-flavor baijiu with awamori prepared in our laboratory under the same condition except for the unique manufacturing process. It was shown that rice-flavor had stronger fruity- and floral-aroma than awamori and awamori had stronger koji-like, oily, and cereal-aroma than rice-flavor baijiu. In addition, ethyl lactate detected in rice-flavor baijiu only and β-phenethyl alcohol contributed to the fruity- and floral-aroma of rice-flavor baijiu. 1-octen-3-ol contributed koji-like aroma in awamori. It was also supported that ethyl lactate in rice-flavor baijiu was produced by yeast metabolite promoting via the supply of a large amount of lactic acid produced by <i>Rhisopus</i> sp. Furthermore, it was confirmed that fatty acid oxygenase activity in awamori koji was higher than that in saccharified rice of rice- flavor baijiu. This showed that awamori koji-mold contributes to producing the characteristic aroma of awamori.</p>	