

学 位 論 文 要 旨	
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題 目	Effect of fermentation type and temperature on quality and flavor components of honkaku shochu (本格焼酎の酒質と香味成分に及ぼす発酵形態及び発酵温度の影響)
<p>Although it has been reported that conditions affect the alcoholic fermentation and the formation of compounds responsible for aroma in shochu, there are few studies on the effect of fermentation types and temperature on the quality and flavor of shochu. Therefore, we investigated the effects of fermentation types and fermentation temperature on the quality of shochu with the aim of diversifying the flavor of Honkaku shochu.</p> <p>Shochu is produced by fermenting rice koji followed by mixing the main raw material. This fermentation type is often referred to as the second shikomi method. On the other hand, Chinese distilled liquor called "Rice flavor Baijiu" is made by a unique method called solid-state saccharification (SSS). In this study, we applied SSS method to Imo-shochu making, and produced imo-shochu using saccharified sweet potato with rice koji. The optimum temperature for SSS was 60°C, and the glucose content reached its maximum at 24 hours when 10 % of rice koji was mixed to sweet potato. Saccharification rate reached 70 % by addition of protease. Subsequently, we investigated the fermentation quality and sensory characteristics of Imo-shochu made by SSS. The fermentation quality of shochu by SSS was not inferior to those with the conventional method. The flavor was evaluated as baked sweet potatoes-like and flowers-like, and the taste was rich and sharp compared to the conventional shochu. In addition, most of the 42 identified volatile components contained Imo-shochu made by SSS were in a slightly higher concentration than conventional shochu. Therefore, it possible to make Imo-shochu by SSS of sweet potato using rice koji.</p> <p>About fermentation temperature, by the typical-temperature process used by shochu makers, the maximum temperature of the moromi during fermentation was set as 25, 32, or 38°C. After distillation, the characteristics of the imo-shochu were determined by sensory evaluation and gas chromatography–mass spectrometry. The yeast population after fermentation was larger, but carbon dioxide productivity was lower, in the moromi fermented at 25°C than in those fermented at higher temperatures. On the other hand, the acetic acid and amino acid concentrations were highest in the moromi fermented at 38°C. Shochu fermented at 25°C was rated as the fruitiest during sensory evaluation and contained more esters such as phenethyl acetate and ethyl caproate. It also contained more higher alcohols and fatty acids, which are substrates of esters. Shochu fermented at 38°C had the most acidic aroma. This was consistent with the higher acetic acid levels in the moromi. Shochu fermented at 32°C had the sweetest and richest taste. Thus, fermentation temperature was found to be a critical factor for the fermentative quality and flavour characteristics of imo-shochu.</p> <p>These results provide new insights into fermentation type and temperatures for designing shochu products. The results of this thesis can contribute to the diversification of shochu production processes and shochu liquor quality.</p>	