Screening of Yeasts in Azalea Nectar for Bioethanol Production

Ota, Chihiro (School: Notre Dame Seishin Gakuen Seishin Girl's High School)
Shimoyama, Natsuno (School: Notre Dame Seishin Gakuen Seishin Girl's High School)

Yeast species in floral nectar, especially Saccharomyces cerevisiae, show high alcohol fermentation properties, with nectar-dwelling non-Saccharomyces yeast Metschnikowia pulcherrima additionally capable of assimilating xylose and cellobiose, and fermenting glucose and galactose. To produce ethanol using woody biomass by yeast, we isolated yeasts from azalea nectar using an accumulative culturing method. The isolates were examined for three properties: xylose assimilation, cellulose decomposition and alcohol fermentation. A total of 44 yeast strains were isolated successfully and seven of them possessed all three properties. An 18S rDNA gene sequence analysis revealed that these seven strains were from species closely related to the genera Metschnikowia and Candida. Finally, we attempted alcohol fermentation in the lignin-removed woody biomass extract using the selected strains. Four of seven strains were confirmed for CO2 gas generation, suggesting that fermentation had occurred. These results indicate that conversion of woody biomass into ethanol by nectar yeast independent of non-woody biomass should be possible in the future.

Awards Won:
Fourth Award of $500