3. Fermentation and its Characteristics of Kombucha using Deep Sea Water

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1. Introduction

Deep sea water is a water resource that has several characteristics such as rich minerals, cleanness, low temperature, and sustainability. Since the 2000s, Deep sea water has been attracted in the United States, Japan, and Taiwan as a material for food, aquaculture, and pharmaceutical industries. However, Korean Deep sea water industry sales are still dependent on drinking water. Kombucha(KBC) is one of the beverages made by fermentation of black tea using sugar and SCOBY(symbiotic culture of bacteria and yeast). KBC is highly popular both domestically and overseas. Especially in the United States, KBC is the beverage of choice for Qin Shi Huang and Hollywood stars, there are KBC sections in supermarkets. In this study, we investigated the difference in microbial communities, chemicals, and functional characteristics during the fermentation of KBC using drinking deep sea water (DDSW) and tap water(TW).

2. Material and method

For the fermentation of KBC, 1 or 2 black tea bags were steeped in glass bottles containing 1L of DDSW (hardness 30, 45, 80, 169, 300) and TW. After removing the tea bags, added black sugar (8% v/v) and SCOBY, and covered with gauze. Fermentation of KBC was conducted under 21 to 23 ℃, avoiding direct sunlight. The microbial community was analyzed on cultivation day 21, and chemical and functional substance analysis was conducted on cultivation days 0, 7, 14, and 21. Furthermore, the optimal hardness of DDSW was selected using sensory evaluation and a taste tester.

3. Result and Discussion

The microbial diversity of KBC using DDSW was higher than that of TW, both of bacteria and yeast. DDSW stimulated the fermentation of KBC more than TW, and anti-oxidation-related substances which are catechins, organic acid, and polyphenols increased in DDSW-fermented KBC. In addition, the inhibition activity of blood-sugar regulation factors (α-glucosidase and intestine maltase) was higher in DDSW-fermented KBC than in TW. Through the sensory evaluation and analysis of the taste tester, the optimal hardness of DDSW was decided to be 80.

It seems that diverse minerals of DDSW stimulate the growth of microorganisms of KBC, which leads to the difference of second metabolites.