P7. Fundamental research on the Cultivation and Preservability of Sprout Vegetables Using Deep Ocean Water

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1. Introduction

As the living standards of modern people have been improved and their interest in health has increased, well-being and environment-friendliness have been spread leading to the expansion of the relevant market resulting in growing interest in sprout vegetables that can be easily and quickly raised and eaten even at home. Sprout vegetables have a shortcoming of low preservability resulting in short shelf lives of about 7 days after harvest. Therefore, difficulties are experienced in circulation, sale, and storage after purchase in many cases, and products being circulated in the market have a disadvantage that they should be consumed immediately after purchase because they are distributed over a long period of time. The purpose of the present experiment is to prove that the cultivation time can be shortened using the eutrophic conditions of deep ocean water and preservability can be improved using the cleanness of deep ocean water by examining whether the use of deep ocean water shows good results in the growth and preservability of sprout vegetables in order to help the distribution, sales, storage, and consumption of sprout vegetables.

2. Methods

The sprout vegetables used in this study were sprout seeds of Raphanus sativus var and Brassica oleracea var. Italica purchased from Danong Company Limited. The first, second, and third experiments were conducted with the sprout seeds.

Cultivation vessels were divided into four groups, as one control group and three experimental groups in the experiments. In the case of the control group, 100% service water was used. Deep ocean water was diluted to use service water 99.85% + raw deep ocean water for experimental group 1, service water 99.75% + raw deep ocean water 0.25% for experimental group 2, and service water 99.65% + raw deep ocean water 0.35% for experimental group 3 in the experiments. Raw deep ocean water was measured using 1 ml, 2 ml pipets and fillers and service water was accurately measured using 100㎖ beakers, 500 ㎖ beakers, 1㎖, 2㎖ pipets and fillers.

The cultivation method is as follows. Brassica oleracea var. Italica seeds soaked in a cultivation vessel filled with water and Raphanus sativus var Spread seeds not soaked were evenly spread and general service water was sprayed twice a day (12 o'clock and 15 o'clock). The water in the cultivation vessels was replaced by new service water and experimental water made using deep ocean water every day before the water was sprayed at 12:00. The temperature was maintained at 15 ~ 20 ℃, and light was blocked by covering the lid for 1 ~ 2 days so that sunlight would not reach the seeds. When two days passed after sowing, newspapers were removed for cultivation. The cultivated seeds were sealed in different disposable plastic containers by population and used for experiment when 7 days passed after harvest.

The harvested sprout vegetables were stored in a refrigerator and left unattended to the extent that they became unedible based on visual inspection. Thereafter, after undergoing a pre-treatment process, mineral tests were conducted to compare and measure mineral contents. General bacterial tests were carried out using 3M general bacterial Petrifilms and the amounts of bacteria, preservability, and the degrees of contamination were compared.

3. Conclusion

In this study, the cultivation of sprout vegetables using deep ocean water showed smaller amounts of general bacteria compared to cultivation using general service water and experimental groups with larger amounts of deep ocean water showed remarkably smaller numbers of bacteria. With regard to quality changes, the rate of changes was lower and the inherent quality was maintained longer in the cultivation using deep ocean water. The experimental results were best in experimental group 3 followed by experimental group 2, experimental group 1, and control group in order of precedence. With regard to growth rates, Brassica oleracea var. italica grew faster by 1.7㎝ on average and Raphanus sativus var grew faster by 4㎝ on average in the cultivation using deep ocean water indicating that deep ocean water has good effects on growth rates too. The amount of minerals (unit mg/ 0.176g) also showed differences in a range of 40 mg~70 mg, indicating that the population for which deep ocean water was used was superior nutritionally.