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Cultivation Conditions for Enhancing Functional Ingredients of Sprout from Colored Wheat

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[Abstract]

Recently, interest in sprout crops using various varieties such as barley and oats has increased. However, in case of wheat, there were disadvantages in that the growth rate was slow and the economic efficiency and utilization were reduced. In order to overcome these disadvantages, this study was conducted on the selection of wheat varieties suitable for cultivation of wheat sprouts. Also, we analyzed the various functional ingredients of wheat sprouts.

[Result and Discussion]

This study tried to develop a wheat sprout containing high functional ingredients. Among the Korean 5 wheat cultivars (4 normal wheat and 1 colored wheat), Ariheuk (colored wheat) was the fastest growth rate. When grown up to 8 days, barley was about 15cm, and Ariheuk showed a growth rate of 2.5-3.0 cm faster than that (17.5~18.0 cm). Colored wheat sprouts had higher polyphenol and flavonoid contents than other normal wheat sprouts. Also, as a result of comparing antioxidant capacity, colored wheat sprouts had higher antioxidant capacity. And this study evaluated the effect of cold treatment on cultivation of wheat sprouts. As a result of comparing the growth rate according to the time of cold treatment, the control group showed the fastest growth rate. The control group took 7 days to reach 15 cm of sprout length. In the case of cold-treated wheat sprout, it took 8 days to reach 15 cm when cold treatment until 4 days. This growth period was not different with barley sprout growth rate. Wheat sprouts, whose growth was inhibited under low temperature conditions, showed a faster growth rate than the existing growth rate when the temperature was raised to 25 °C. These results indicate that as a method for increasing the functionality of wheat sprout, when low-temperature stress was induced, growth was initially inhibited, but the rate of final growth was not significantly different. During the growth of wheat sprout, cold treatment induced stress on plants, increasing the content of polyphenol (0.780 mg/ml) and flavonoid (0.482 mg/ml) by 10-15% compared to not treated group. In addition, antioxidant activity such as radical scavenging activity was increased by 5-10%. This increase of antioxidant activity is expected to contribute to other functional effects. The method of cultivating colored wheat sprout with the above contents can improve the functional composition of wheat sprout than the general cultivation method, so it can be widely used for the development of various products including wheat germplasm.

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