Nutrition, antioxidant, and polyphenol content of seasonal Japanese mugwort and its blanched product

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【Objective】 To preserve the Japanese mugwort (JM) and to investigate the effect of blanching treatment and harvest season on nutritional composition, antioxidant activity, and total polyphenol content (TPC), seasonal JM blanched with the various solution were studied.

【Method】 JM was harvested in April (SP), August (SUM), and November (AUM) 2018 at Takanoo-cho, Tsu city, Mie prefecture. JM was blanched with tap water, deionized water, 0.5 % and 1.0 % sodium chloride, and 0.1 %, 0.2 %, 0.3 % and 0.4 % sodium bicarbonate solution. The antioxidant activity of JM was assessed by hydrophilic oxygen radical absorbance capacity (HORAC) method. TPC was determined by Folin-Ciocaluteu method. The nutritional composition was measured by proximate analysis, and carbohydrate content was calculated by subtraction. The main phenolic acids were determined by HPLC and LC-MS analysis.

【Results】 The main macronutrient of JM was carbohydrates, followed by crude protein, while ash and crude fat were found in trace amount. After blanching, the yield of JM extract in all blanching treatments was decreased. The TPC and HORAC value varied by season. The extract of SUM had the highest in both TPC and HORAC value, followed by SP and AUM, respectively. The extract of blanched JM showed TPC and HORAC value higher than the frozen sample (p <0.05). The thermal processing disrupts cell wall of plant, resulting in the breakdown of phenolic compounds from the complex structure. Thus, the phenolic compounds may more extractable in the blanched sample. According to HPLC and LC-MS analysis, the two major phenolic acids of JM were chlorogenic acid and another one is tentatively to be dicaffeoylquinic acid.