

Composition and functionality of “matcha” of different qualities

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Abstract

Free amino acids, catechin content, and inhibitory effects against carbohydrate absorption in rats were assessed for “matcha” of different qualities. Among the tested matcha from three different companies, low-quality matcha was found to have more powerful inhibitory action on carbohydrate absorption than high-quality matcha. With regard to the structural components of matcha, free amino acids were more abundant in high-quality matcha, and were less abundant in low-quality matcha. On the other hand, catechin content was lower in high-quality matcha, but was higher in low-quality matcha. These results indicate that low-quality matcha, which has a higher catechin content, has greater functionality than high-quality matcha. It may therefore be possible to increase the utility of low-quality matcha by using it as an ingredient in functional foods.

Keywords : matcha, quality, function, rats, carbohydrate absorption

I Introduction

The quality of “matcha” (powdered green tea) is generally assessed using sensory evaluations. Matcha is sorted for use as dark “koicha” or light “usucha”, for tea ceremony lessons, and for cooking on the basis of flavor, fragrance and color. “Koicha” and “usucha” are further sorted into more detailed classifications, and the category to which a particular tea is assigned makes a substantial difference in the price it can command. The quality of green tea is evaluated by sensory evaluations in the same way as matcha, and there have been numerous attempts to evaluate the quality of green tea more objectively. High-quality green tea is believed to have greater amounts of total nitrogen and free amino acids, but total nitrogen and free amino acids are not always reflected in the price of green tea. It appears that the “umami” and sweetness of the amino acids, as well as factors such as the astringency of the tannins, are important in determining the quality of green tea. Moreover, green tea rich in catechins is sold at higher prices as a food for specified health use, as tea catechins have recently been shown to have various disease preventative actions, including inhibition of blood glucose

increase¹⁾, anti-obesity action²⁾, hypertension inhibition³⁾ and anti-tumor activity⁴⁾.

There have thus been numerous reports concerning the relationship between the quality of green tea and its components, and also concerning the functionality of these components¹⁻⁶⁾. However, there are few reports on the relationship between the quality and structural components of matcha, and there have been almost no studies on the quality, structural components and functionality of matcha.

The present study therefore examined how matcha quality relates to its components and its functionality.

II Materials and Methods

1. Materials

Matcha of five different qualities (prices) was purchased from three different companies based in Kyoto prefecture (companies A, B and C) in 2013 (Table 1). The fixed prices of matcha are shown in Table 1. (-)-Epicatechin (EC), (-)-epigallocatechin (EGC), (-)-epicatechin gallate (ECG), (-)-epigallocatechin gallate (EGCG) and o-phthalaldehyde