Note

日本食品化学学会誌、Vol. 31(3), 97-104 (2024)
Japanese Journal of Food Chemistry and Safety (JJFCS)

Development of gamma-aminobutyric acid-enhanced fermented adzuki bean paste using germinated brown rice koji flours

(Received August 20, 2024)
(Accepted October 30, 2024)

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Abstract

The germination processes of the grains and beans have been explored as an effective method to increase the gamma-aminobutyric acid (GABA) contents of these plants. The fermented adzuki bean paste was prepared using germinated brown rice koji flours after germination for 36 h at 30 °C and relative humidity of 70% to develop GABA-enhanced fermented adzuki bean paste using brown rice koji flours with rich functionality. The viscosity and breaking force of the fermented adzuki bean paste using germinated brown rice koji flours were significantly high when compared with those of the fermented adzuki bean paste using polished rice koji flours. In addition, the fermented adzuki bean paste was prepared using germinated brown rice koji flours as well as the fermented adzuki bean paste using polished rice koji flours had markedly low energy. In contrast, the GABA content of the fermented adzuki bean paste was prepared using germinated brown rice koji flours was remarkably higher than that of the fermented adzuki bean paste using polished rice koji flours. In conclusion, the GABA-enhanced fermented adzuki bean paste using germinated brown rice koji flours is a novel and valuable adzuki bean paste with nutritional and functional characteristics for health-conscious consumers.

Keywords : characterization, nutrient enhancement, fermentation, gamma-aminobutyric acid, germination

I Introduction

Rice is one of primary and important grains and a staple food in Asian countries including Japan. Especially, brown rice is rich in fibers, minerals, vitamins, and phytochemicals owing to the existence of rice bran and germ when compared with the polished rice[1]. Therefore, the dairy intake of brown rice is useful as sources of not only energy but also these nutritional components and bioactive substances, although the consumption of brown rice is limited due to hard texture and eating quality[2]. In recent years, germinated brown rice have received an attention for the changes of nutritional, physicochemical, and functional properties during germination process[3]. Germination brings to the improvement of sweetness, taste, texture, and cookability of brown rice. In addition, the digestion and absorption property of the germinated brown rice is superior to those of brown rice and the germinated brown rice contains gamma-aminobutyric acid (GABA)[4], which is an amino acid with health-promoting abilities such as suppression of blood pressure, improvement of sleeplessness, anti-stress effect[5, 6], and reduction of the risk of atherosclerosis and vascular inflammation[7]. Thus, it is considered that the germinated brown rice is one of functional foods and the most fascinating grains.

Historically, fermentation of foods has been performed as a technique to enhance not only these preservabilities and safeties but also these nutritional values and organoleptic properties as taste and texture. Currently, various fermented foods are

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