



UNIVERSITI TEKNOLOGI MARA

**CHEMICAL COMPOSITION AND BIOACTIVITIES OF
GERMINATED BAJONG BROWN RICE**

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ABSTRACT

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Brown rice contain more nutritional components than ordinary white rice. The purpose of this study is to determine the optimized condition for rice germination, the presence of bioactive compound and antioxidant properties in Bajong brown rice. The chemical composition and bioactivities of germinated brown rice which is total phenolic compound (TPC), total flavonoid compound (TFC) and DPPH were determined by UV-Visible spectrometer while the presence of functional group of gamma-aminobutyric acid (GABA) was analyzed using fourier transform infrared (FTIR). In this study, brown rice was soaked in water for 6, 12, and 24 hours at room temperature. Brown rice was soaked to get the germinated (sprout) of the brown rice. Therefore, the fastest germination is after 24 hours of soaking due to the completely wetted of the brown rice. The total flavonoid for 6, 12 and 24 hours of germinated brown rice was 1.2839, 1.2540 and 0.9047 mg GE/g. Next, the total phenolic content in 6, 12 and 24 hours of germinated brown rice was 474.291, 472.197 and 476.197 mg GAE/g. The highest DPPH content in germinated brown rice was 3.96%. Furthermore, functional group of GABA was found in germinated brown rice where the sample was being compared to the standard of GABA.

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CHAPTER 1

INTRODUCTION

1.1 Background of study

Specific name of Rice is *Oryza sativa* commonly named as Asian Rice. In 1970's, consumption of brown rice (BR) was most popular in Japan because BR contains rich fiber and other nutrients but due to the fact that brown rice had to be cooked in the pressure cooker and still hard to chew and less tasty, the popularity of BR did not last long (Patil and Khan, 2011). Therefore, germinated brown rice (GBR) becomes new popular in Japan due to GBR is tastier than BR. Germinated brown rice commonly named as sprouted brown rice because the seed grown from its dormant state. Brown rice undergoes soaking process to make it germinated.

According to Wu F *et al.* (2013) by eating germinated brown rice, it healthier than white rice because it provided more bioactive components such as ferulic acid, γ -oryzanol and GABA as well as more fundamental nutritional components such as vitamins, mineral, vital amino acid and

CHAPTER 2

LITERATURE REVIEW

2.1 Sarawak local rice

Figure 2.1 shows some of local rice in Sarawak. There are mainly eight types of rice in Sri Aman – Betong division which are *Bubok*, *Mamut*, *Bajong*, *Kurau*, *Nyamuk*, *Telasih*, *Chelum* and *Bali* (Lai *et al.*, 2017). Most of the rice mentioned are brown rice. Khazanah researcher institute (2018) mentioned that the production of paddy in Sri Aman – Betong division are around 41,625 hectares in Sri Aman and 29,594 hectares in Betong. According to Teo (2011), in Sarawak there are more than 100 varieties of rice.

According to Yusop *et al.* 2021, in Sarawak, most of the paddy farms are still upland and rain fed where this paddy is popularly known by the local people as “padi huma”. Rice fields in Sarawak are very enchanting and diverse. Rice ecosystems of rice paddies exist there all over the state. In the hills and valleys, fragile and stable rice environment coexist.