

# Sensory Properties and Antioxidant Activity of Steamed Rice with Various of Black and White Rice Ratio

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## Abstract

Black rice (BR) has higher content of fiber than white rice (WR). Furthermore, black rice contain anthocyanin which has numerous beneficial for health, including anti hyperglycemic effect and protection from cardiovascular disease. Unfortunately, it has firmer texture and distinguished flavor, which makes it not as preferable as WR. Adding white rice increased the acceptance of steamed black rice. The percentages of white rice which added in this study were 0% (S100); 25% (S75); 50% (S50); 75% (S25); and 100% (S0). Scoring preference test was used for sensory analysis, followed by proximate analysis for fiber and water content, total starch using Nelson-Somogyi method, total anthocyanin using pH differential method, total phenolic using Folin-Ciocalteu method, and antioxidant activity using 2,2-diphenyl-1-picrylhydrazyl (DPPH). S50 had the highest sensory preference while S25 was the lowest due to its pale color. S50 had higher fiber, anthocyanin, and phenolic content and higher antioxidant activity than S0, while it had higher total starch, water content, and tenderness than S100. Cooking process had reduced antioxidant activity on steamed BR, while the adding of WR had reduced it more. Based on the results, S50 was the best possible mix because it had the highest preference index and still had anthocyanin and phenolic content and antioxidant activity.

*Keywords:* Black rice; sensory preference; anthocyanin; phenolic; antioxidant.

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## Introduction

Rice (*Oryza sativa*) is consumed as staple for nearly half of the world's population, especially in Asia. Even before the 1960s, Indonesia has become the largest rice consuming country per capita, followed by China and India (Mohanty, 2013). While Asia is provenas rice's center of species origin, Indonesia is believed to become the secondary of species origin for it has a great diversity of rice genetics (Sitaresmi *et al.*, 2013).

Two main subspecies of rice are *japonica* and *indica*, while Chang (1984) separated the third subspecies i.e. *javanica* or *tropical japonica*. Morphologically, it is closer to *indica*, thus some rice workers tend to classify it as its variant. But genetically, it is closer to *japonica* (Chakraborty, 2001; Chang, 1984; Haryanti *et al.*, 2013). While Garris *et al.* (2005) further divided *indica* as *indica* and *aus*, and *japonica* as *aromatic*, *temperate japonica*, and *tropical japonica*; by genetic evidence they suggested that *temperate japonica* was derived from *tropical japonica*.

Historically, the evidence of rice cultivation in Bali and Java was only recorded from the ninth century AD which stated that rice had become a major subsistence crop at the time (Christie, 2007). Some rice cultivars which are widely known today, such as *Mentik Wangi*, was already recorded on Javanese literature from the 19<sup>th</sup> century, i.e. *Serat Centhini* (Ranggasutrasna *et al.*, 2008). White rice is the cultivar