

Effect of cooking on phytochemical contents and chemopreventive activities of glutinous purple rice

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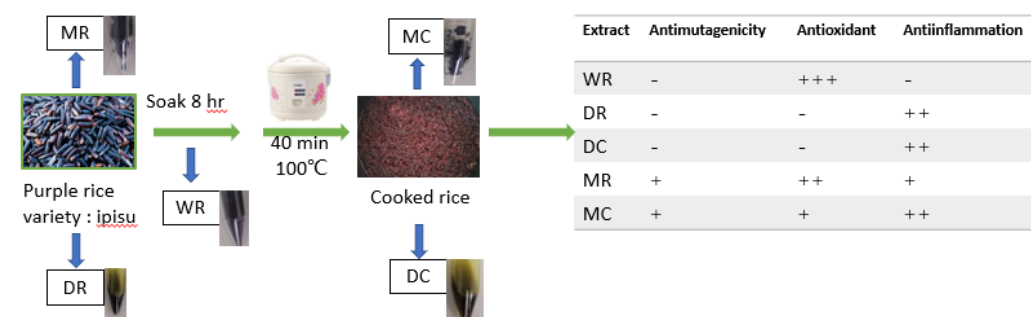
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Abstract: The health promoting capabilities of colored rice makes it attractive to consumers and researchers due to its pharmacological properties. The heat generated during cooking can alter the chemical composition of rice. This study aimed to compare the phytochemical contents and chemopreventive activities of purple rice extracted from both raw rice and cooked rice. Raw and cooked purple rice was extracted with dichloromethane and subsequently by methanol to obtain dichloromethane and methanol extracts. Furthermore, to obtain the water extract, purple rice was soaked in water overnight before being cooked. The results indicate that the methanol and water extracts of the rice presented higher contents of polyphenols, flavonoids, and anthocyanins than the dichloromethane extracts, while the dichloromethane extracts contained higher amounts of vitamin E. The water extract presented the strongest degree of antioxidant activity in DPPH, ABTS, and FRAP assays, while the methanol extracts of the rice exhibited stronger antimutagenicity using Ames test. Furthermore, methanol and dichloromethane extracts showed anti-inflammatory activities in LPS-induced macrophages. After the cooking process, amounts of hydrophilic compounds were decreased, while the amount of vitamin E increased. Moreover, the cooking process reduced antioxidant activity detected by ABTS assay which correlated with a reduction in anthocyanin content. However, the antimutagenicity and anti-inflammatory activities of the extracts were persistent after cooking. It has been suggested that heat can destroy some of the beneficial phytochemicals in purple rice, while its biological function remains. The outcomes of this study have provided a more comprehensive perception of cooked purple rice as a source of cancer chemopreventive agents.

Graphical abstract:



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WR: water extract of raw rice, DR: dichloromethane extract of raw rice, MR: methanol extract of raw rice, DC: dichloromethane extract of cooked rice, MC: methanol extract of cooked rice

Keywords: cooked purple rice; phytochemical analysis; chemopreventive activities; antimutagenicity; antioxidant; anti-inflammation

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