

Chemical profiles of three varieties of germinated rice based on LC-MS and their antioxidant activity

In this study, chemical profiles in different germinated rice extracts (GREs) using different solvent extraction ratio were investigated. Three varieties of germinated rice (GR), including germinated white rice (GWR), germinated black rice (GBR) and germinated red rice (GRR) were extracted using 70 and 100% ethanol (v/v). Both extracts were characterized for their chemical profiles using liquid chromatography-electrospray ionization-quadrupole-time-of-flight mass spectrometry (LC-ESI-Q-TOF-MS). The content of γ -aminobutyric acid (GABA), total phenolic content (TPC), and antioxidant activities were also determined. The chemical profiles of GREs are composed of organic acids, amino acids, vitamins, flavonoids, and phenolic compounds. The GABA content of all rice varieties presented the same pattern in both ethanolic extracts. The TPC of GRE extracted by 70% ethanol (v/v) showed significant higher amount than that in the 100% v/v ethanolic extract ($p < 0.05$). The highest TPC was obtained from GBR, followed by GRR and GWR, respectively ($p < 0.05$). The antioxidant activity from three assays, including DPPH, ABTS, and FRAP showed higher activities in the 100% v/v ethanolic extracts than their 70% v/v counterparts ($p < 0.05$). The phenolic content showed a low positive Pearson correlation with antioxidant activities, however, the strong positive Pearson's correlation coefficients were observed among these activities ($r = 0.846-0.935$). The results suggested that the GR was composed of potential bioactive compounds such as GABA and other phytochemical contents possessing high antioxidant bioactivity which can be used as functional food or as part of nutraceutical products.

Keyword: Germinated rice extract; Chemical profiling; Antioxidant activity; LC-ESI-Q-TOF-MS; γ -aminobutyric acid