Effect of grain development on antioxidant activity of Thai landrace rice

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Abstract :
This research was conducted to investigate the total phenolic content (TPC), anthocyanin content (AC) and antioxidant capacity of two varieties of Thai landrace rice i.e. Kumbikiew (black glutinous rice) and Niaow Dang (red glutinous rice) at 30, 37 and 51 days of grain development. The results showed that the TPC of Kumbikiew rice was highest at 51 days (319.72 mg GAE/100 g db); however the TPC of Niaow Dang rice (424.50 mg GAE/100 g db) was highest at 30 days and significantly higher than those at later stages ($p \leq 0.05$). Overall, Kumbikiew rice had higher AC than Niaow Dang rice at all stages of development after flowering. Both cultivars showed the highest AC at 30 days (178.67 and 1.11 mg Cyanidin-3-glucoside/100 g db, respectively). The antioxidant capacity determined using DPPH, ABTS radical scavenging and FRAP assays demonstrated as trend similar to that of TPC. The FRAP values, DPPH and ABTS scavenging activities of Kumbikiew rice at 51 days (6.38 mmol $FeSO_4$/100 g db, IC_{50}^{DPPH} 2.05 mg/ml and IC_{50}^{ABTS} 1.49 mg/ml, respectively) were significantly higher than those at 30 and 37 days. The highest antioxidant activities of Niaow Dang rice were detected at 30 days, showing reducing power (FRAP) at 5.75 mmol $FeSO_4$/100 g, IC_{50}^{DPPH} at 2.17 mg/ml and IC_{50}^{ABTS} at 1.31 mg/ml.

Keywords: Thai landrace rice, TPC, anthocyanin, antioxidant activity