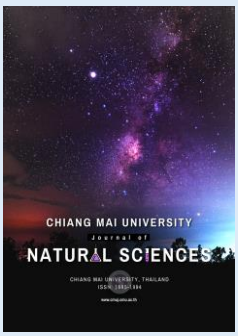

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Research article

Production of Antioxidant Bioactive Compounds during Mycelium Growth of *Schizophyllum commune* on Different Cereal Media

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Abstract *Schizophyllum commune* or split gill mushroom is a nutrient-rich natural food ingredient. Even during mycelium growth, *S. commune* could produce the bioactive compounds including phenolic and flavonoid compounds. The aim of this research was to characterize the production of bioactive compounds during mycelium growth period of *S. commune* cultured onto different eight edible cereal media (sorghum, corn, barley, wheat, oat, jasmine rice, Mun Poo rice and riceberry rice). The antioxidant activities and mycelial biomass were also observed during their growth. The results show that the highest mycelial growth rate was obtained onto barley and jasmine rice, while the lowest one was found in sorghum and corn. The concentration of phenolic compounds increased along with the mycelial growth. The fungal culture on wheat significantly exhibited the highest production of phenolic compounds which was 8.56 ± 1.09 mg GAE/g DW on day 8. The highest flavonoid production of 577.35 ± 29.93 µg CE/g DW, was remarkably found onto barley from day 6. The degradation of certain flavonoids in cereal materials by *S. commune* was also observed, particularly in riceberry rice. Antioxidant activity of cultured cereals was depended on the initial activities of materials and was mainly increased by *S. commune* metabolism. The DPPH• and ABTS•$^{+}$ scavenging activities were sharply increased at day 4 which was early stage of log phase of *S. commune*. At day 8, most of cereal media exhibited high DPPH• activity with a half maximal inhibitory concentration (IC_{50}) range of 3.83-5.80 mg DW/mL, except jasmine rice. Only wheat and oat could significantly give the highest ABTS•$^{+}$ scavenging activity which was in an IC_{50} range of 2.38-3.27 mg DW/mL. The highest FRAP activity with a median effective concentration (EC_{50}) of 2.14 ± 0.23 mg DW/mL, was observed in barley which corresponded with its highest flavonoid content. Antioxidant activities of S. commune culture onto cereal media were correspondent with their phenolic and flavonoid contents. Therefore, this study assured that several antioxidative substances were interestingly produced by using *S. commune* cultured onto the selected edible cereals, which could be possibly developed as a new supplement or active ingredient for pharmaceutical and food industries.

Keywords: Antioxidant activity, Bioactive compound, Cereal, Schizophyllum commune, Split gill mushroom

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