Phenolic compounds of aqueous and methanol extracts of *hypsizygus tessellatus* (brown and white var.) and *flammulina velutipes* caps : antioxidant and antiproliferative activities

Chinonso Ishmael Ukaegbu[a], Samiur Rashid Shah[a], Hazrulrizawati Abd Hamid[a], Oluwaseun Ruth Alara[b], Md. Zaidul Islam Sarker[c]

[a] Faculty of Industrial Sciences &Technology, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300, Gambang, Pahang, Malaysia

[b] Faculty of Chemical and Natural Resources Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300, Gambang, Pahang, Malaysia

[c] Faculty of Pharmacy, International Islamic University, Gombak, Malaysia

ABSTRACT

Since the World Health Organization has suggested the exploration of natural products for cancer management owing to the side effects of chemotherapy and irradiation on humans and breast cancer accounts for the highest number of cancer related deaths globally, this study has examined antiproliferative effects of the aqueous and methanol extracts of *Hypsizygus tessellatus* (brown and white var.) and *Flammulina velutipes* caps against two breast cancer cell lines. The antioxidant and antiproliferative activities of these mushroom extracts were evaluated *in vitro* using chemical-based (for antioxidant activity) and cell (for antiproliferative activity) approaches. Furthermore, the phytochemical composition of the mushroom extracts were identified using mass spectroscopy (UPLC-QTOF/MS). The obtained results showed aqueous extracts of *F. velutipes* (Enoki) and white *H. tessellatus* (Bunapi shimeji) caps to possess higher antiodixant activities against DPPH (IC_{50} = 0.202 and 0.573 mg/mL, respectively), and H_2O_2 (IC_{50} = 0.622 and 0.745 mg/mL, respectively) compared tothe methanol extracts. Aqueous extracts of the mushrooms also showed better ferric reducing antioxidant power (FRAP) values against ferric ions compared to the methanol extracts. Finally, the mushroom extracts showed good antiproliferative activities against human breast cancer cell lines. These findings suggest the presence of phytochemicals with antiproliferative and antioxidant acrtivities in the mushroom extracts studied.

KEYWORDS

Antioxidant; antiproliferative; F. Velutipes; H. tessellatus; phytochemicals

ACKNOWLEDGMENTS

The authors are grateful to the University Malaysia Pahang for supporting this study under Grant numbers PGRS1703102 and RDU160156.