IN VITRO ANTIOXIDANT AND CYTOPROTECTIVE EFFECTS OF HOT-WATER EXTRACTS OF THE OYSTER MUSHROOM PLEUROTUS OSTREATUS

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Abstract

Pleurotus species, like many edible and medicinal mushrooms, are a good source of antitumor/immunostimulating and antioxidant effector molecules with preventive and/or therapeutic potential. Hitherto, research has tended to focus on its dietary value; however, there is relatively little information pertaining to their antioxidant activity and their possible use to inhibit oxidative stress. Herein, the antioxidant potential of hot-water extracts from both mycelium (Myc-E) and fruiting bodies (FB-E) of the oyster mushroom Pleurotus ostreatus was investigated. At the concentration of 10 mg/mL, the extracts showed the most potent scavenging effects for DPPH radical (96.05% and 90.35% for Myc-E and FB-E, respectively), ABTS radical (55% and 80% for Myc-E and FB-E, respectively) and inhibition of lipid peroxidation (47.2% and 51.2% for Myc-E and FB-E, respectively). Moreover, the mushroom extracts at a maximum concentration of 5 mg/mL manifested reducing power of 1.105 and 0.438 for Myc-E and FB-E, respectively. These results suggest that not only Pleurotus fruiting bodies, but also its mycelium may be useful in the prevention of diseases mediated by reactive oxygen species. Taking into account that Pleurotus fruiting bodies-derived preparations are currently being considered for their approval as dietary supplement by the Cuban regulatory authorities, we additionally evaluated the cytoprotective properties of FB-E. The pre-incubation of a human red blood cell (hRBC) suspension with FB-E led to a significant reduction (p< 0.05) in the hemolysis percent and hemoglobin denaturation exerted by lauryl sodium sulphate (LSS, 40 mg/L) [81.77% in FB-E+LSS vs. 100% LSS alone –for hemolysis- and 128% in FB-E+LSS vs. 425% in LSS –for hemoglobin denaturation]. FB-E also showed a protective effect against the hydrogen peroxide (H2O2) oxidative damage in erythrocyte membrane, reflected in the levels of catalase enzymatic activities compared with the H2O2 group (22.95 AU/g Hb in FB-E vs. 102.6 AU/g Hb in the H2O2 group). These findings could be related to the presence of bioactive metabolites, such as phenolic compounds, flavonoids and ascorbic acid, identified in the preparations. In sum, the present study suggests that hot-water extracts from Pleurotus ostreatus in view of their antioxidant and cytoprotective properties, could serve as potential food supplements, nutraceuticals or even as pharmaceutical agents of industrial relevance.

Key words: Medicinal mushrooms, Pleurotus ostreatus, hot-water extracts, antioxidant effect, cytoprotective effect, nutraceuticals

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