8th International Medicinal Mushroom Conference, 8IMMC, organized by Autonomous University of the West – Cali, University of the Province of Caldas and National Higher Learning Service SENA, Manizales, Colombie. (24-27 de August)

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

Yaixa Beltrán[1], Rosa Isabel Aguirre[2], Humberto J. Morris[1*], Pedro Luis Batista[3], Gabriel Llauradó[1], Tarcizia Armando[1], Yamila Lebeque[1], Serge M. Moukha[4], Isabelle Gaime-Perraud[5], Carmenza Jaramillo[6]

[1]Center for Studies on Industrial Biotechnology (CEBI), University of Oriente. Reparto Jiménez, Santiago de Cuba 5. CP 90 500, Cuba

[2]Department of Biology, Faculty of Natural Sciences. University of Oriente. Reparto Jiménez, Santiago de Cuba 5. CP 90 500, Cuba

[3]Center of Toxicology and Biomedicine (TOXIMED), Medical University of Santiago de Cuba. Autopista Nacional Km 1 1/2. Apdo Postal 4033. Santiago de Cuba 4. CP 90 400, Cuba

[4]Laboratory of Toxicology and Applied Hygiene/ INRA, Bordeaux University -Campus de Carreire, 146 Rue Léo-Saignat, 33076 Bordeaux Cedex, France.

[5]Mediterranean Institute of Biodiversity and Ecology, UMR CNRS IRD 7263, Aix Marseille University - Campus de l'Etoile, 13397 Marseille Cedex 20, France

[6]National Center of Coffee Research, Manizales. Colombia.

***Email:** hmorris@cebi.uo.edu.cu; morrishumberto@gmail.com

## 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 considering 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 ($H_2O_2$) oxidative damage in erythrocyte membrane, reflected in the levels of catalase enzymatic activities compared with the $H_2O_2$ group (22.95 AU/g Hb in FB-E vs. 102.6 AU/g Hb in the $H_2O_2$ 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

**Subject:** Medicinal values and pharmacology of medicinal mushrooms

**Modality:** Oral presentation