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Effects of Pleurotus eryngii var. eryngii in "in vitro" and "in vivo" cancerogenetic models

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Heat shock proteins (Hsps) are highly expressed in a variety of cancer types contributing to tumor cell propagation and protection against apoptosis [1]. The current anti-cancer therapy is not always target specific and often is associated with complications for patients, Therefore new effective, specific and less toxic therapeutic approaches are needed. Medicinal mushrooms have emerged as wonderful source of nutraceuticals, anti-oxidants, anticancer, prebiotic, anti-inflammatory, cardiovascular, anti-microbial, and anti-diabetic. The ongoing research projects are aimed to promote mushrooms as new generation "biotherapeutics" [2]. The aim of this study was to evaluate whether the cold-water extracts of Pleurotus eryngii var. eryngii can affect Hsp90, 70, 60 and 27 levels in an in vitro model of colon cancer (C26 cells). Cell viability was evaluated using MTT assay after treating the cells with different concentrations of extracts (0-1.9 $\mu g/\mu l$) in the culture medium for 24 and 48 hours. Hsp90, 70, 60 and 27 levels were measured using western blotting and immunofluorescence analysis. Moreover, we evaluated the anticancer effect of the P. eryngii var. eryngii extract in an animal model of ectopically-implanted C26 colon carcinoma, widely used as an experimental model of cancer cachexia. We prepared a mixture of lyophilized P. eryngii var. eryngii with the mice standard diet and the animals were daily fed with ~4g of the mix until they died to draw a survival curve. We sampled the neoformations grown after implantation e on these we performed an immunohistochemistry for Hsp60. Our results showed that the extract significantly decreased cells viability at 0.48 $\mu g/\mu l$ after both 24 and 48 hours of treatments. Western blotting analysis and immunofluorescence showed that Hsp60 protein levels were down-regulate at 24h of treatment but increased after 48h. On the contrary, Hsp90, 70 and 27 protein levels did not changed. In the in vivo model, P. eryngii var. eryngii in the diet significantly extended the median survival compared to untreated mice. The immunoistochemical experiments suggested that Pleuery significantly affected the increase of Hsp60 protein levels. These preliminary results are promising for further studies to better understand the potential effects of P. eryngii var. eryngii on cancer progression especially regarding Hsp60 role.

References

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Key words

Hsp60, Pleurotus eryngii, cancer.