

Antioxidant and Gene Protective Effects of Medicinal Mushrooms *Inonotus obliquus* (Pers.:Fr.) Pilát and *Phellinus robustus* (P. Karst.) Bourd. et Galz.

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Fungal melanin pigments were shown to display high antioxidant activity. This work was designed to isolate melanin pigments from *Inonotus obliquus* and *Phellinus robustus* to study their antioxidant and gene protective properties during metabolic activation of aromatic amines by the peroxidase pathway of oxidation.

Investigation of the element composition of exo- and endomelanins of *Inonotus obliquus* and *Phellinus robustus* showed that these species distinguish one from another insignificantly. However, it has been demonstrated that the content of carboxyl groups in endomelanins of both investigated species was two times higher in comparison with exomelanins. IR- spectra of exo- and endomelanins of *I. obliquus* and *Ph. robustus* were also similar. The molecular weight of exo- and endomelanins from *I. obliquus* was 35–60 kDa, and from *Ph. robustus* 40–60 kDa.

The obtained data indicate that the alkaline fraction of exo- and endomelanins of *I. obliquus* had a molecular mass of 55–60 kDa, *Ph. robustus* 65–70 kDa, the alcohol fraction of *I. obliquus* 25–30 kDa, and *Ph. robustus* 40–45 kDa. The melanins of both

species also contained a small quantity of substances with the molecular mass of 100–120 kDa.

Melanins isolated from both mushrooms and applied at a concentration above 20 µg/mL inhibited the reaction of peroxidase-mediated oxidation of *o*-dianisidine (DA). It was demonstrated that the ability of melanin isolated from *Ph. robustus* to inhibit peroxidase-mediated free radical oxidation of DA was considerably lower than that of the pigment from *I. obliquus*. The highest degrees of inhibition of peroxidase-mediated DA oxidation with melanins isolated from *Ph. robustus* (75 µg/mL) and *I. obliquus* (75 µg/mL) mushrooms were 75% and 80%, respectively. Our data showed that melanin isolated from *I. obliquus* inhibited peroxidase-mediated oxidation of DA more efficiently than it prevented damage to DNA induced by oxidation products. In contrast, melanin from *Ph. robustus* applied at a lower concentration inhibited the formation of DNA/DNA crosslinks more readily than it prevented DA oxidation. Such properties of melanins can be used in developing new anticarcinogenic drugs.