

Isolation and characterization of chitosans from edible mushrooms

¹Milos Beran, ¹Marian Urban, ¹Lubomir Adamek, ¹, ²Jiri Spevacek

¹Food Research Institute Prague, v.v.i., Radiova 7, Cz 10231 Prague, Czech Republic

²Institute of Macromolecular Chemistry AS CR, v.v.i., Heyrovskeho namesti 2, Cz 16206 Prague, Czech Republic

M.Beran@vupp.cz

Beside their traditional food usage, mushrooms can be used as a source of many pharmacologically active compounds, especially polysaccharides. Wastes after industrial processing of edible mushrooms, such as *Agaricus* or *Pleurotus* species, can also become free and alternative source of chitin – chitosan materials, beside the traditional industrial source – shellfish waste materials.

Chitosan is an attractive material for multiple industrial applications, most of them in nutritional, pharmacological, biomedical and cosmetic fields.

Chitosans have been extracted from *Pleurotus ostreatus*, *Agaricus hortensis* and *Lycoperdon perlatum* using successive alkali and acidic extraction and characterized by physiochemical methods, including ¹³C NMR and IR spectrometry.

Chitosan yields were usually within the range of 3 - 7% of the mushroom dry weight, depending on stage of growth and mushroom parts, with great intra- and extra-species variabilities, in agreement with literature. Exceptionally high chitosan yield, exceeding 40% of the mushroom dry weight, were obtained from overripe *Lycoperdon* fruiting bodies containing spores. The degree of acetylation (DA) of the isolated mushroom chitosans were in the range from 0.18 to 0.5, molecular weights in the range from 10 to 100 kDa, in accordance with literature.

Harsh conditions with excessive amount of caustic alkalies and high temperatures (120 - 130°C) have been necessary for effective chitin deacetylation with sufficient chitosan yields. This process is the cause of relative high chitosan prices and produces great amount of alkali sewage. Development of ecological and cheap biotechnological process of extraction chitosan from mushroom biomass without the treatment with excessive caustic alkalies is in progress at present at time our department with promising results.

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