

ABSTRACT

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Title of diploma thesis: **Inhibitory effect of anthocyanidins on hepatic carbonyl reductase**

Carbonyl reductase (CBR) is a reducing enzyme that plays a significant role in the first phase of biotransformation of both endogenous and exogenous substrates. It participates in detoxification of many xenobiotics, among them important drugs. Differences in expression and activity of hepatic biotransforming enzymes may affect efficiency and safety of treatment. The aim of this work was to compare the activity and expression of CBR in old and young individuals and to define an inhibitory effect of selected anthocyanidins on the activity of CBR in humans and rats and to determine a value of IC_{50} and a type of inhibition for the strongest inhibitors.

Meaningly higher activity of CBR was detected in the senescent rats compared to the young ones and the old rats also showed larger interindividual variability. No significant age-related differences have been identified by measurement of activity CBR in human samples. Anthocyanidins showed a mild to moderate inhibitory effect on CBR. The enzyme was most strongly inhibited by delphinidin ($IC_{50} = 16 \mu\text{M}$) in humans and by pelargonidin ($IC_{50} = 23 \mu\text{M}$) in rats. Delphinidin acted as a non-competitive inhibitor of CBR, whereas the mixed type of inhibition of CBR was determined for pelargonidin.