

**THE EFFECT OF POLYPHENOLIC COMPOUNDS ON THE
FUNCTIONAL PROPERTIES OF RAT LIVER MICROSOMES
TREATED WITH LOW-DOSE γ -IRRADIATION**

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The development of new radioprotective drugs is very important in countries contaminated by the Chernobyl disaster. The aim of this study was to investigate the γ -radiation-induced damage of rat liver microsomes and microsomal membranes and to evaluate the radioprotective properties of isoflavonoid genistein-8-C-glucosides (G8CG) isolated chromatographically from lupine flowers in our laboratory, and of flavonoid quercetin (Sigma).

Rats were irradiated once with γ -rays (1 Gy), killed after 3 days and liver microsomes were isolated. The level of thiobarbituric acid-reacting lipid peroxidation products (TBARS) in the liver microsomes was found to have increased (by 16 %), whereas the rates of NADPH- and NADH-oxidation, and NADPH- and NADH-ferricyanide reduction by liver microsomal membranes was found to have decreased 3 days after the whole body γ -irradiation (by 25, 31, 29 and 17%, respectively, compared to the control animals). At the same time we observed neither significant changes in the level of protein SH groups in the microsomal membranes nor changes in membrane fluidity after γ -irradiation.

The treatment of the rats with G8CG (75 mg/kg b.w., i.p., twice per day after γ -irradiation) gave a clear protective effect, preventing the increase in TBARS formation and inhibition of NADPH- and NADH-oxidase and NADPH- and NADH-ferricyanide reductase activities in the rat liver microsomes. The effect of quercetin in a dosage equimolar to G8CG showed a more pronounced effect on the above microsomal parameters.

Thus, low-dose whole-body γ -irradiation damages the xenobiotic-metabolising function in rat liver microsomes but does not change the physical properties of microsomal membranes. The active polyphenolic compounds, flavonoid quercetin and isoflavonoid G8CG characterize as quite effective radioprotectors.