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The antioxidant activity of birch sap (*Betula pendula*) in aluminium-induced oxidative stress in rats

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Statement of the Problem: Numerous studies pointed out the oxidative stress induced by exposure to aluminium. The generation of the reactive oxygen species (ROS) has as consequences the impairment of different organs normal function. Birch sap (or birch water) can be obtained from different species of *Betula*, being considered a traditional drink in different countries. Some authors noted that birch sap contains some antioxidants and, in this aim, the purpose of this study is to determine if the use of birch sap can counteract the oxidative stress induced by aluminium.

Methodology: The study was made on 32 Wistar rats divided in four groups: Group I (C, control) receiving tap water containing 50 ppb Al, Group II (Al)–1000 ppb Al as aluminium sulphate (AS), Group III (1000 ppb AS + birch sap and Group IV receiving only birch sap. The exposure period was 30 days. The results were statistically analyzed by ANOVA.

Findings: Aluminium (Al) exposure determined the increase of serum superoxide dismutase (SOD, 17.22%, $p < 0.05$), glutathione peroxidase (G-Px, 38.45%, $p < 0.001$) and thiobarbituric reactive substances (TBARS, 31.12%, $p < 0.001$) but significantly decreased catalase (CAT, 39.63%, $p < 0.001$), glutathione (GSH, 18.29%, $p < 0.001$) and glutathione reductase (GSH-r, 27.25%, $p < 0.0001$) levels, these results pointed out that Al-induced oxidative stress in the rats. Following administration of birch sap, the levels of the oxidative stress biomarkers were restored almost to normal levels, indicating possible good antioxidant properties of the sap. The obtained values for the oxidative stress biomarkers were: SOD, 5.11%, G-Px, 10.11%, TBARS, 3.12%, CAT, 6.31%, GSH, 5.29%, and GSH-r, 6.18%.

Conclusion: Birch sap due to its contained in some antioxidants could offer protection against free radicals produced in blood as a result of aluminium exposure.

Biography

Alexandru O Doma is PhD student in Faculty of Veterinary Medicine from Banats University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara. He is secretary of Romanian Society for Trace Elements in Medicine and has built his experience in research, evaluation, teaching during the PhD period.

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