

# TOXICOLOGY & APPLIED PHARMACOLOGY

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## Trace elements homeostasis in rats exposed to Cisplatin and the protective effect of *Aronia melanocarpa* extract

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**Statement of the Problem:** Natural remedies have been used for centuries to promote good health. *Aronia melanocarpa* (Black chokeberries) due to its high content anthocyanins, phenols, antioxidants, vitamins, and minerals was considered to be a functional food and could be used as natural remedies in different disorders including cancer. Researchers have reported that the use of Cisplatin can be followed by an imbalance of some essential trace elements and by the use of some natural remedies we can counteract these effects. The purpose of this study is to determine if the use of *A. melanocarpa* extract can reestablish the homeostatic imbalance produced by cisplatin exposure on some essential trace elements.

**Methodology:** The study was made on 40 Wistar rats divided in four groups: C (control): receiving 1ml saline i.p.; E1: receiving cisplatin 20mg/kg bw, i.p.; E2: receiving cisplatin 20mg/kg bw, i.p and *A. melanocarpa* 6% aqueous extract and CB (control blank): 1ml saline i.p *A. melanocarpa* 6% aqueous extract for 2 weeks. At the end of the experiment, the blood was collected and prepared for trace element analysis. The samples mixed with nitric acid were prepared by microwave digestion for 10 min and after were analyzed by atomic absorption spectroscopy, the outcomes were statistically analyzed by ANOVA.

**Findings:** Cisplatin administration was followed by a significant imbalance in the trace elements homeostasis, comparatively with the control, rats exposed to Cisplatin presented a not significant ( $p>0.05$ ) decrease of Mg (-7.18%) and, a significant decrease of Zn (-31.28%,  $p<0.05$ ), Se (-29.22%,  $p<0.05$ ), Cu (-36.44%,  $p<0.05$ ) and Fe (-66.28%,  $p<0.01$ ) and a significant ( $p>0.05$ ) increase of Mn (+28.11%). *Aronia melanocarpa* aqueous extract administration after Cisplatin was followed by restoration of studied trace elements as follows: significant increase ( $p<0.01$ ) of Zn (+63.87%), Mg (+82.15%), Se (+48.36%), Cu (+42.25%), Fe (+39.11%) and Mn (+31.33%), suggesting the defense against Cisplatin homeostatic imbalance.

**Conclusion:** The study recommended the important protective role of *Aronia melanocarpa* aqueous extract as a natural remedy against Cisplatin deleterious side-effects on trace elements homeostasis.

### Biography

Florin Muselin has his expertise in heavy metals reproductive toxicology, oxidative stress, and medicinal and poisonous plants. He is president of Romanian Society for Trace Elements in Medicine and Associate Professor at the Faculty of Veterinary Medicine from BUASVM Timisoara, Romania. He has built this model after years of experience in research, evaluation, and teaching in educational institutions. PhD degree since 2006 and Habilitation from 2017.

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