

## Abstract

# Evaluation of the Effect of Elderberry (*Sambucus nigra*) Fruit Extracts on Calcium and Magnesium Status in STZ-Induced Diabetic Rats <sup>†</sup>

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**Abstract:** Diabetes mellitus (DM) is one of the most prevalent lifestyle diseases with an increasing impact on human health. Chronic hyperglycaemia in diabetes leads to various metabolic disorders such as protein glycation, fluid and mineral imbalance, and deterioration of tissues. Currently available pharmacological treatments of DM help control glycaemia and slow down diabetic complications. On the other hand, they can also cause various side effects. Medicinal plants can contribute to controlling hyperglycemia and reducing diabetic complications. One such plant is the elderberry (*Sambucus nigra* L.) which contains several biologically active phytochemicals and minerals that can support in the therapy of DM. The objective of this study was to evaluate the effect of elderberry fruit extract (lipophilic (LFSn) and phenolic (PhFSn) fractions) supplementation on the calcium and magnesium status in diabetic rats. The experiment was performed on 32 male Wistar rats which were divided into four groups: healthy control, diabetic control, diabetic treated with LFSn (1.5 g/kg b.w./day) and diabetic group treated with PhFSn (5 g/kg b.w./day) for 4 weeks. Hyperglycaemia (diabetes) was induced by feeding rats with a high-fat diet and STZ injections (55 mg/kg b.w). After a four-week test period, animals were sacrificed to collect blood, internal organs and femoral bones for biochemical assays. The Ca and Mg status was evaluated on the basis of the contents of these minerals in the blood serum, liver, kidneys and femoral bones, using the AAS method. The tissue samples were mineralized in 65% nitric acid (MW oven). The results were evaluated statistically using software Statistics ver. 13.0, at  $p < 0.05$ . It was found that chronic hyperglycaemia disturbed Ca and Mg status which was evidenced by a significant loss of tissular Mg content and calcification of kidneys in diabetic rats. Treatment with both types of *Sambucus nigra* fruit extracts normalized the kidney Ca content, while PhFSn extract decreased the liver Mg content in diabetic rats. The results demonstrated an appreciable potential of *Sambucus nigra* fruit extracts in ameliorating the Ca and Mg imbalance in diabetic rats.

**Keywords:** *Sambucus nigra* fruit extracts; calcium; magnesium; diabetes; rats



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