# DETERMINATION OF HEAVY METALS IN SAMBUCUS NIGRA AND GROUND

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## Introduction

**Elderberry fruits (Sambucus nigra L.)** are usually found in open or semi-open fields and at the edges of forests with various mixtures of willow, poplar, elm, and oak. The elderberry's adaptation to a wide variety of climatic conditions has allowed it to achieve an extensive range of distribution. The most favorable environment for its development includes soils rich in bases, nitrogen, and phosphate.

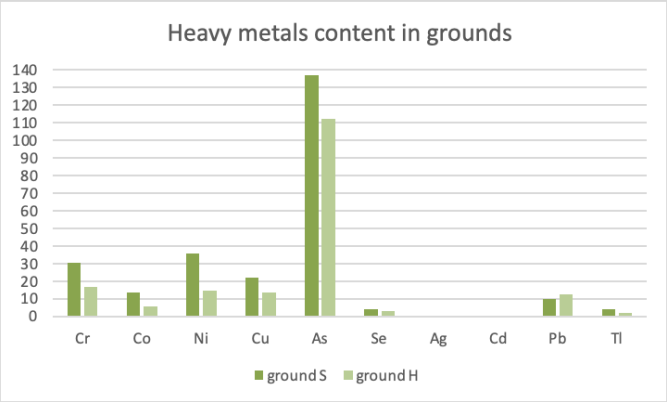
Samples of *Sambucus nigra* and the soil in which these trees developed were collected in 2024 from two different areas of Cluj County — Hășdate and Săcălaia. The fruits of *Sambucus nigra* were kept and analysed in freeze-dried form.

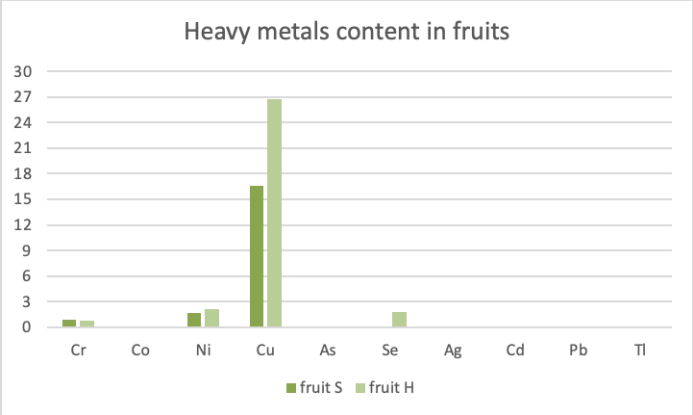
## Methodology

Three grams of dried, ground, and sieved sample were digested with hydrochloric and nitric acids. After 16 hours of oxidation at room temperature, the mixture was further digested for two hours and then cooled. The solution was filtered into a 100 ml volumetric flask, and microelements were analyzed by flame aspiration and absorbance measurement, with results reported as the average of at least two readings.

## Results

In the graphs below we can see major differences between the compounds found in the fruit compared to the amount found in the soil. Among the toxic compounds we can mention As, Ag, Cd, Pb, Tl, and the beneficial elements are Cr, Co, Ni, Cu, Se. The element with the highest value in the soil samples is As (137 mg/kg), and Ag is found in the lowest amount (<1 mg/kg). In fruits, the highest value is presented by Cu (26.75 mg/kg), and Tl is in the lowest amount (0.1 mg/kg).




| Symbol | Normal values (mg/kg) |
|---|---|
| Sb | 5 |
| Ag | 2 |
| As | 5 |
| Ba | 200 |
| Be | 1 |
| B | 1 |
| Cd | 1 |
| Co | 15 |
| Cr | 30 |
| Cr(VI) | 1 |
| Cu | 20 |
| Mn | 900 |
| Hg | 0,1 |
| Mo | 2 |
| Ni | 20 |
| Pb | 20 |
| Se | 1 |
| Sn | 20 |
| Tl | 0,1 |
| V | 50 |

In the attached table we have the normal values of the elements according to ORDER No. 756 of November 3, 1997 for the approval of the Regulation on the assessment of environmental pollution.

In comparison with the values obtained, we can see that the values obtained for the fruits harvested in Sacalaia are more beneficial than those obtained for the fruits from Hasdate. Toxic heavy metals do not exceed normal values in either of the two fruit samples.

## Conclusion

It can be observed from the presented paper that the freeze-dried samples from Săcălaia best preserved all the benefic heavy metal compounds, contributing to a beneficial impact on the products in which it is to be added.