# Metal Content in *Prunus spinosa* Fruits Collected from Different Locations in Cluj County, Romania

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## INTRODUCTION

*Prunus spinosa* L. (blackthorn) is a wild shrub species common in Europe, valued for its antioxidant-rich fruits. Environmental factors and soil composition influence the accumulation of metals in its tissues, making it a potential bioindicator of pollution.
This study investigates the levels of essential and toxic metals in *Prunus spinosa* fruits collected from five sites in Cluj County, Romania, to assess spatial variability and environmental impact.

## MATERIALS AND METHODS

Fruits of *Prunus spinosa* were collected during the 2025 harvest season from five locations in Cluj County, Romania: Chinteni, Pata, Borhanci, Făget, and Florești. Samples were washed, air-dried, homogenized, and digested using a mixture of nitric acid ($HNO_3$) and hydrogen peroxide ($H_2O_2$).
Metal concentrations (Fe, Na, Mg, K, Ca, Al, Ni, Cu, Zn, Cr, Co, Cd, Pb, Mn, Ba, Sr) were determined using Inductively Coupled Plasma (ICP). Results were expressed in mg/kg dry weight and descriptive statistics were applied to evaluate site differences.

## CONCLUSIONS

The study highlights that *Prunus spinosa* fruits can accumulate both essential and potentially toxic metals, with noticeable spatial variability among the investigated sites in Cluj County.

Higher concentrations of certain elements, such as Pb and Cr, may indicate localized pollution sources. Overall, *Prunus spinosa* shows potential as a bioindicator species for assessing environmental metal contamination in semi-natural ecosystems.

## ACKNOWLEDGEMENTS

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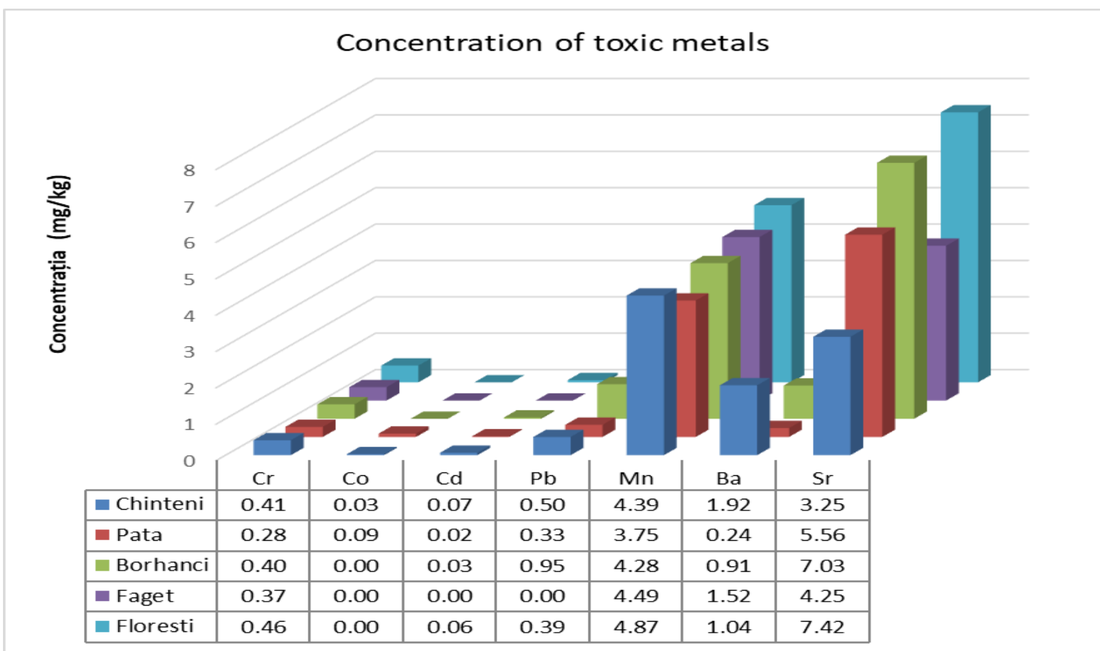
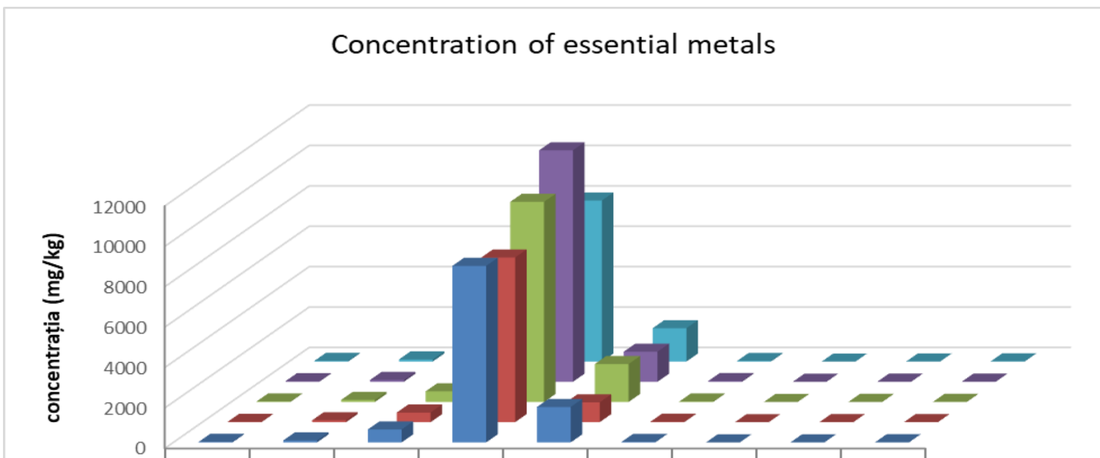
## RESULTS AND DISCUSSION

The concentrations of essential metals (Fe, Na, Mg, K, Ca, Al, Cu, Zn) and potentially toxic metals (Cr, Co, Cd, Pb, Mn, Ba, Sr) varied among the sampling sites.

Potassium (K) and calcium (Ca) were dominant essential elements, while Fe and Zn showed moderate variability between locations.
Among toxic elements, Pb and Cr exhibited higher levels in some sites, suggesting possible anthropogenic influence.
The spatial differences observed indicate that environmental factors such as soil composition, traffic emissions, and agricultural practices may influence metal accumulation in *Prunus spinosa* fruits.




| | Cr | Co | Cd | Pb | Mn | Ba | Sr |
|---|---|---|---|---|---|---|---|
| Chinteni | 0.41 | 0.03 | 0.07 | 0.50 | 4.39 | 1.92 | 3.25 |
| Pata | 0.28 | 0.09 | 0.02 | 0.33 | 3.75 | 0.24 | 5.56 |
| Borhanci | 0.40 | 0.00 | 0.03 | 0.95 | 4.28 | 0.91 | 7.03 |
| Faget | 0.37 | 0.00 | 0.00 | 0.00 | 4.49 | 1.52 | 4.25 |
| Floresti | 0.46 | 0.00 | 0.06 | 0.39 | 4.87 | 1.04 | 7.42 |




| | Fe | Na | Mg | K | Ca | Al | Ni | Cu | Zn |
|---|---|---|---|---|---|---|---|---|---|
| Chinteni | 26.0 | 97.7 | 641.0 | 8738.7 | 1753.0 | 21.7 | 0.4 | 5.2 | 7.6 |
| Pata | 19.1 | 95.5 | 477.0 | 8153.3 | 980.3 | 21.4 | 0.4 | 3.7 | 5.5 |
| Borhanci | 26.3 | 102.5 | 527.0 | 9906.3 | 1875.7 | 23.3 | 0.1 | 4.5 | 6.8 |
| Faget | 29.4 | 89.6 | 753.7 | 11458.3 | 1487.3 | 36.8 | 0.1 | 5.2 | 8.9 |
| Floresti | 34.0 | 103.8 | 572.0 | 7969.2 | 1649.7 | 32.0 | 0.1 | 4.9 | 13.0 |