

## **Analyzing the Accumulation of Trace Elements in Moss Samples from Agricultural and Mountainous Environments**

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Georgia is characterized by its mountainous terrain and vast diversity in landforms. To understand the impact of agricultural lands and mountainous areas on the accumulation of trace elements in mosses, the concentrations of selected metals in mosses across these environments was compared. *Hypnum cupressiforme* was selected as the biomonitor species for this study, focusing on samples collected from 2019 to 2023. Samples from urban or industrial areas were excluded, with 24 samples from agricultural zones and 30 from mountainous areas were analyzed. The Mann-Whitney U test revealed no significant difference in levels of Cd, Co, Fe, Mn, Ni, Sr, and Zn between the two groups. However, Al, Ba, Cr, Cu, Pb, and V showed significant differences. Comparative analysis of samples from Moldova, which is a predominantly agricultural country, with moss samples collected near agricultural areas of Georgia, showed significant variances in Cd, Cu, Ni, Pb and Zn, but when compared to Georgian mountain areas, all elements except Co, Fe, Mn and V showed significant differences.

Median concentrations of Al, Ba, Sr, and Zn were higher in Moldova, while all other elements were higher in Georgia. The lowest median concentrations were observed in mountainous areas, except for Co, Ni, and Pb, which were lower in Moldova. The nearly identical Cr concentrations in agricultural areas suggest that fertilizers, often containing Cr, are a significant source of this element.

The findings indicate that pollutants are more easily spread in open areas than in mountainous ones. Georgia and Moldova have slightly different geochemical compositions, with slight differences in the distribution of elements like nickel and zinc between agricultural and mountainous areas in Georgia, but significant differences from Moldova. Additionally, the impact of transport on the environment in Georgia is noticeable. These results are valuable for biomonitoring studies in areas with varying physical and geographical conditions, suggesting further research to uncover more connections between element distribution and environmental conditions.