

GASTROPOD SHELLS AS POLLUTION INDICATORS IN MINING REGIONS: PRELIMINARY STUDY IN THE ARIEȘ VALLEY (APUSENI MOUNTAINS, ROMANIA)

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The pollution effect increased in the last decades due to the industrial progress and also due to the orientation of economy towards a consumption society. An increased degree of pollution determines the scientist to find ways to diminish the effects. The technical development allowed new high performance instruments to be used for pollutant detection. In many cases, pollutants are present in the environment in small concentrations and for their detection high performance and expensive devices are necessary.

Due to specific biological activity, pollutants can be concentrated in different plants and animals, at levels several orders higher than those recorded in the environment (HAAS et al., 1998). This increased concentration can cause major perturbation in the biological cycle or even the death of the individuals.

The increased concentration of different pollutants in certain plants and animals can be used for monitoring pollution with the help of less expensive methods.

Previous research has been focused mainly on the study of metals present within shells and skeletons of different marine animals in order to use these values as pollution indicators (AUERNHEIMER et al., 1984; BOURGOIN, 1990; GUZMAN & JIMENEZ, 1992; AUERNHEIMER & CHINCHON, 1997).

The present study intends to demonstrate the possibility of using terrestrial gastropod shells as pollution indicators. 28 gastropod shells from 8 regions affected by pollution in various degrees were analyzed. The analysis was done by using X-ray fluorescence spectroscopy (XRF) and X-ray diffraction (XRD). The analyzed shells were compared with shells collected from non-polluted areas.

Our results indicate that the gastropod shells collected from the neighbourhood of settling ponds and mine waste dumps accumulate significant amounts of Pb, Zn, Cu, Fe and Mn.

In conclusion, gastropod shells can be successfully used in the study of heavy metal pollution in mining regions and also in establishing the geochemical lower limits for different bivalent metals in non-polluted regions.

References

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