

**COMPLEX MODELLING OF POLLUTANTS' TRANSFER IN THE ECOTONE ZONE REPRESENTED BY EPIKARST**

**Abstract**

Epikarst represents the ecotone between surface ecosystems and deep karst. Is the unsaturated zone which started to be studied in the last years and which harbours the highest concentration of fauna in karst massifs. Being near the surface, organic matter and pollutants enter rapidly and can sedimentate in this zone, but it can act also as a buffer-zone. The study of epikarst is possible through sampling of dripping water and its fauna inside caves. Due to spatial and temporal heterogeneity aquatic fauna distribution in the unsaturated zone, the study of each drip can bring supplementary information about the natural heritage of the pollutant circulation. Seasonal variation of groundwater species distribution in the drippings is caused by different amount of precipitation and/or the speed of underground infiltration etc. Apuseni Mountains were chosen as study zone for their richness in subterranean fauna and also, high density of human population. Human impact is reflected in the groundwater quality. The complex study, geomorphologic, hydrologic, chemico-physical and biological of the epikarst can offer information about the limits of polluted areas, degree of pollution and danger of contamination for deep aquifers. Data taken from field or obtained in laboratory will be introduced in a mathematic algorithm to model surface impact on groundwater quality and subterranean biodiversity. Spectrometric, isotopic and molecular analysis will be undertaken on dripping water and some frequent species. Pollutants residence time, impact on biodiversity and the use of subterranean bioindicators will be established.

**Objectives**

- ◆ Spatial and temporal investigation of the groundwater fauna distribution from the percolation water related to water quality.
- ◆ Building-up the vulnerability map for the epikarst in the area of study, by superimposing the biological, physico-chemical, geomorphologic and hydrologic data and to establish the risk areas, with high potential of aquifer pollution from the Padurea Craiului Mountains.
- ◆ Elaborate a model concerning the function of epikarst ecosystem, in spatially and temporally context taking into account the presence/absence of the surface pollutants.
- ◆ Establish the guidelines for the management of endangered zones in the area of study.
- ◆ To establish the limits of protected areas for the Nature 2000 network.
- ◆ To establish activities in order to increase the public conscience from the region as concerned the outcome of groundwater protection as a resource for drinking water.

**Research team**

Dr. Oana Teodora Moldovan (coordinator)

Dr. Traian Brad

Dr. Sanda Iepure

Dr. Tudor Tămaş

Drd. Ioana Meleg