



# An assessment of the state and evolution of the quality of the atmosphere in Cluj-Napoca area, using lichens as heavy metal bioindicators

## Authors:

Gagyı Palfy Andrea(1), Stan Gheorghe(1), Mihăiescu Radu(1), Irimia Georgiana Ioana(1), Stoian Laurențiu Cristian(2)

(1) Faculty of Environmental Sciences, Babeş-Bolyai University, Cluj-Napoca, România;

(2) Faculty of Geography, Babeş-Bolyai University, Cluj-Napoca, România

Corresponding author: Gagyı Palfy Andrea, [andrea.gagyı@yahoo.com](mailto:andrea.gagyı@yahoo.com)

## The aim of the study

### **The analysis of the state of health and quality of the atmosphere in Cluj-Napoca area with the help of bioindicators:**

The main goal of this study was to determine the concentration of heavy metals in native lichens sampled in different points of Cluj-Napoca city in order to determine which are the areas with the highest concentrations of heavy metals in the air.

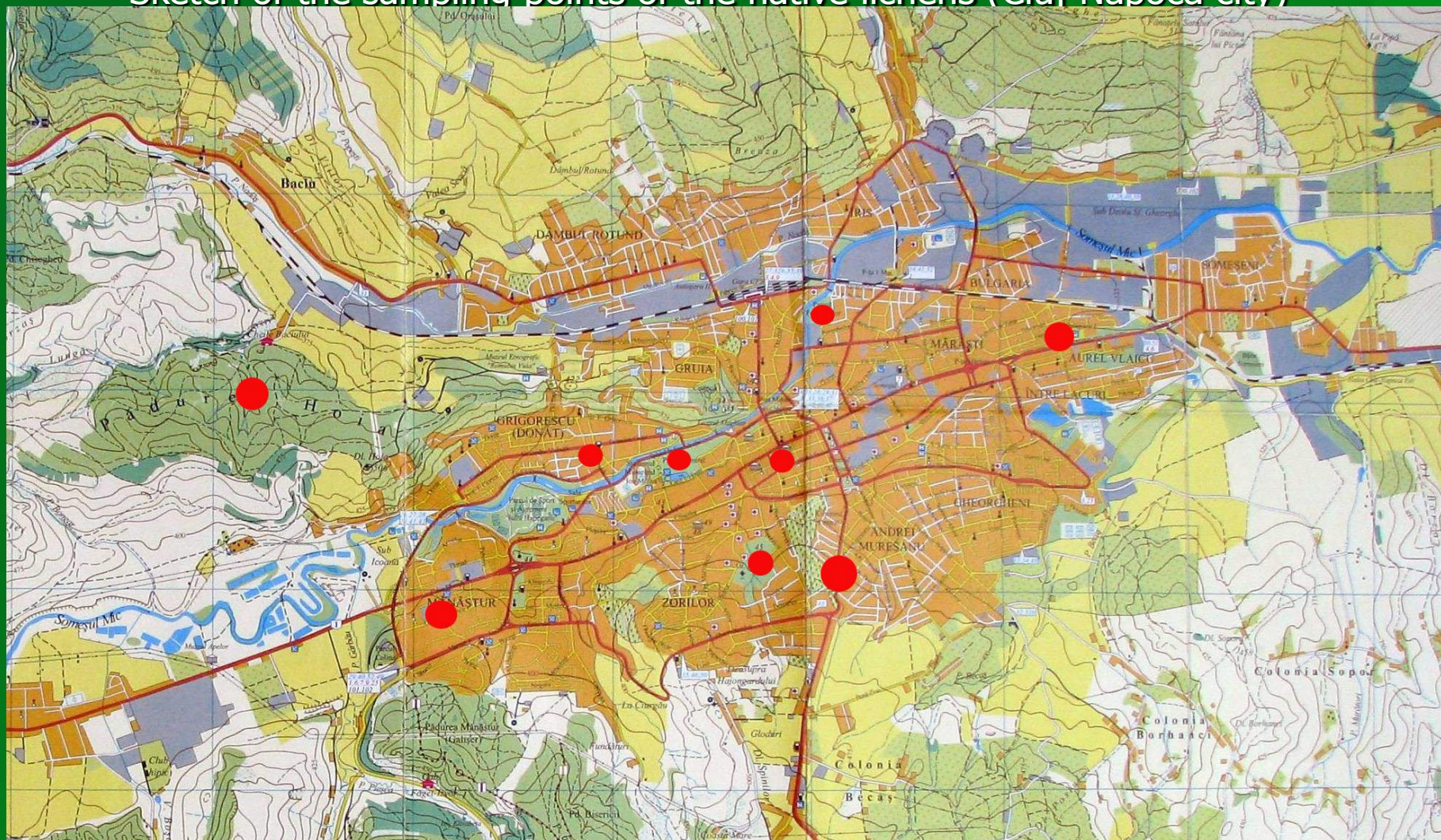
#### **Followed aspects:**

- the actual state
- the evolution in time



# Location of the sampling points

Sketch of the sampling points of the native lichens (Cluj-Napoca city)





## The native lichens sampled



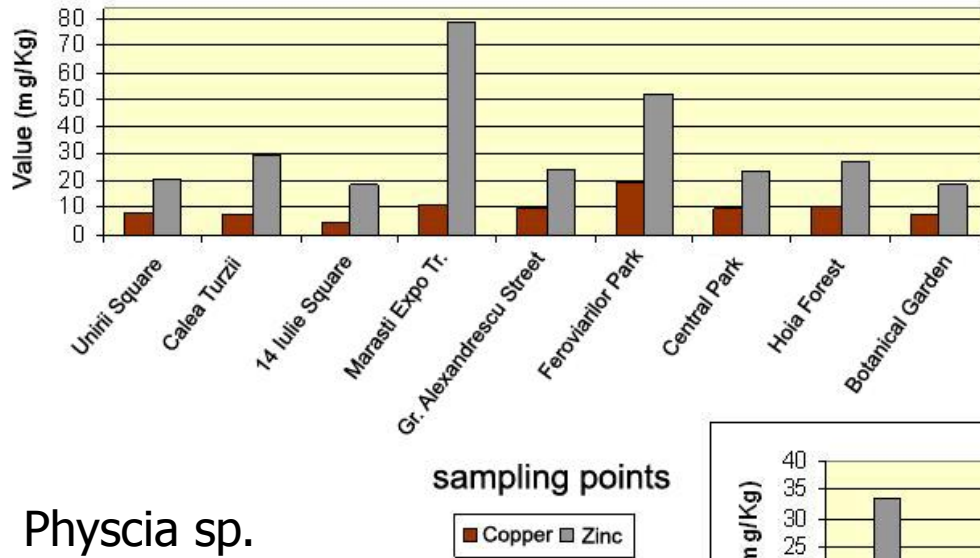
**Xanthoria parietina**



**Physcia sp.**

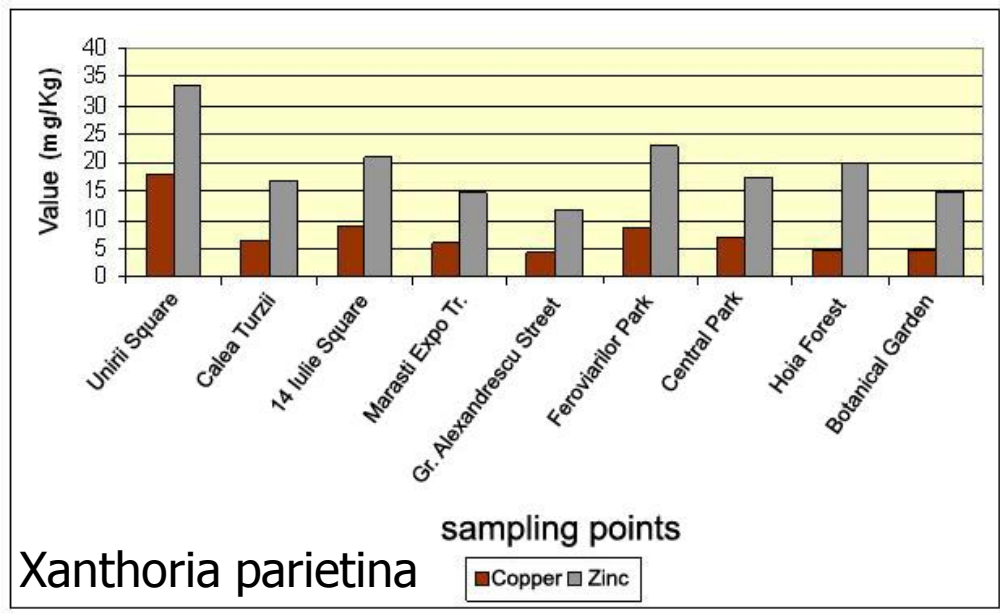


# Results and discussions



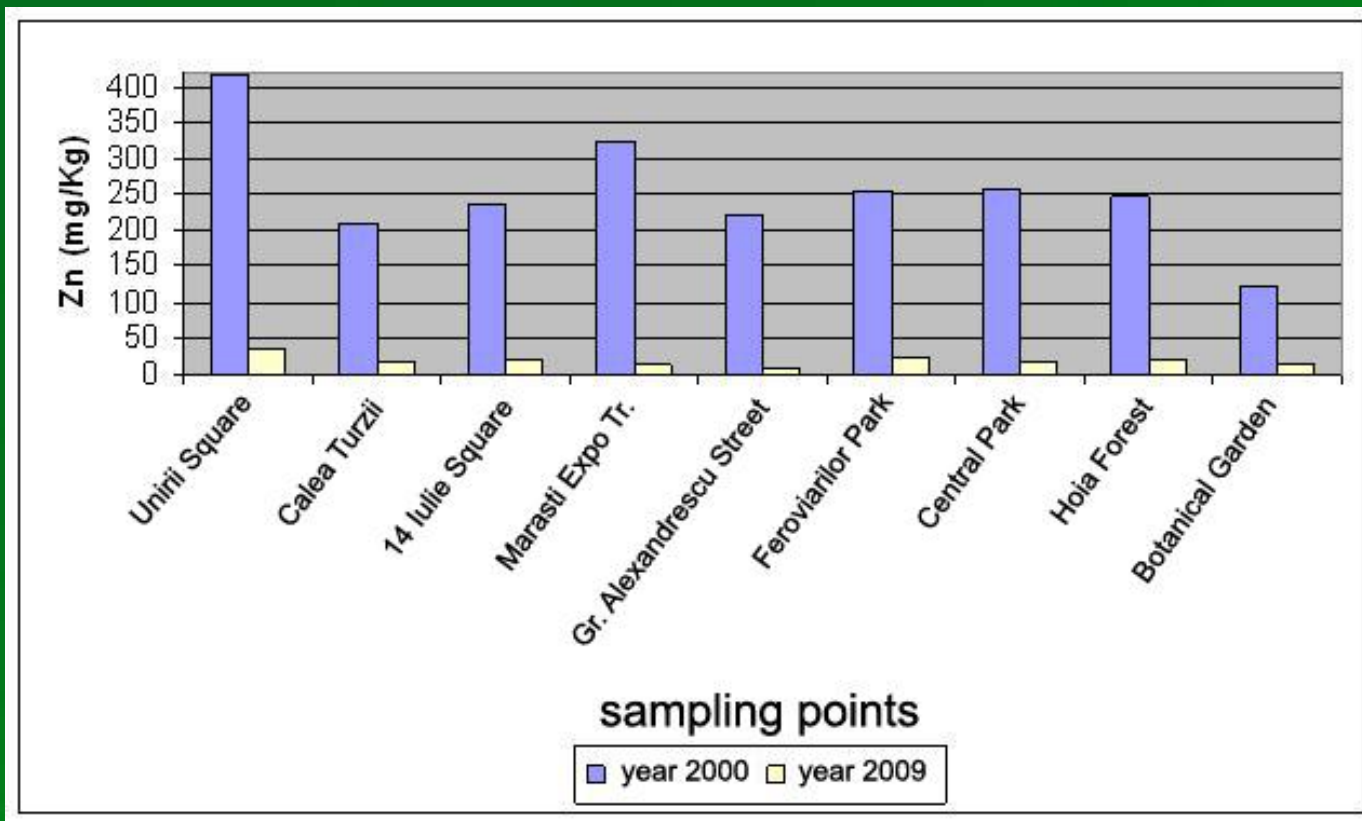
The two lichen species absorb metals differently

The biggest quantities of Cu, Zn and Pb were found in the lichens from the high traffic areas





## Comparison study



The measures taken to reduce air pollution and the leaded fuel ban could have determined the decrease of the high concentration of these elements in the atmosphere.



## Conclusions

- The accumulation of heavy metals in the thallus of the lichens can be directly correlated with the intensity of car traffic
- The largest amounts of Cu, Zn and Pb were accumulated in the lichens from the areas with high traffic
- When compared with the result of the study conducted in 2000, it can be clearly seen that the concentration values of these heavy metals in the studied lichens have significantly decreased.
- Lichens accumulate heavy metals differently
- This study will be developed and further results will be obtained

**Thank you for  
your attention!**

