

## **LEAD LEVELS IN SOIL-WATER-PLANT CHAIN FROM A FORESTRY ECOSYSTEM**

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### **ABSTRACT**

Lead level was determined in soil (20 cm and 40 cm deep), water (water sources for wild game) and plants from three Forest Districts placed in areas with different degree of pollution.

Determination of lead concentration was made in forestry ecosystem to see the impact of heavy metals (lead) on wildlife.

In soil lead concentration was in limits at both depths (20cm and 40 cm) for all three Forest Districts, in water samples lead level exceeded the maximum admitted limit for drinking water (0.01 ppm) and for surface water (0.01 ppm) and from ecological point of view were in the Vth quality class.

Lead concentration was under the maximum admitted limits for plants in all three Forest Districts.

### **INTRODUCTION**

Lead is known as a heavy metal with high risk of pollution [2, 3]. It has several impacts on digestive tract, kidneys, bones, nervous system [1].

Lead concentration was determined to see lead impact on forestry ecosystem and the risk level for heavy metals pollution. The industry was place within 10-40 km from the research areas. One area was placed near a heavy polluting industry and the other two were placed in areas known as areas with low risk of pollution or unpolluted.

### **MATERIALS and METHODS**

The study was carried on soil, water and plants samples during two hunting seasons (2007-2009) in three different area regarding the level of pollution: Forest District C. (county A.), Forest District M. (county S.) and Forest District T (county T.).

The aim of the study was to determine lead level in the food chain from a forestry ecosystem.

Lead concentration was determined by atomic absorption spectroscopy (AAS AA-6650 Shimadzu) after microwave digestion by CHEM MARS X.

The data were statistically performed by ANOVA method and Student test.



## RESULTS

Lead concentration was significantly higher ( $p < 0.01$ ) at 20 cm than at 40 cm depth. At 20 cm depth lead concentration was lower than maximum admitted limit in all three Forest Districts (figure 1).

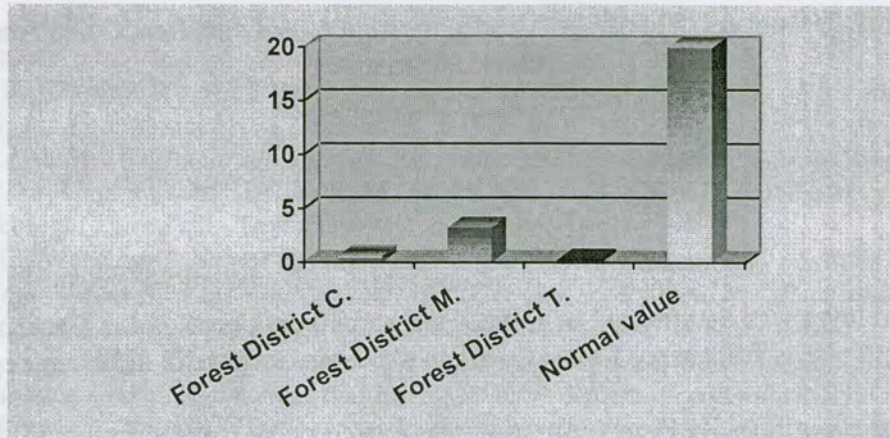


Fig. 1 . Lead concentration in soil during 2005-2009 period at 20 cm depth (mean values)

Lead concentration in water exceeded maximum admitted limits for drinking water (0.01 ppm according Law 458/2002) [5] and surface water (0.01 ppm according HG 100/febr. 2002) [4] and according to MMGA nr.161/2006 the quality class was V [6].

Lead concentration in water from forestry ecosystem is summarized in figure 2.

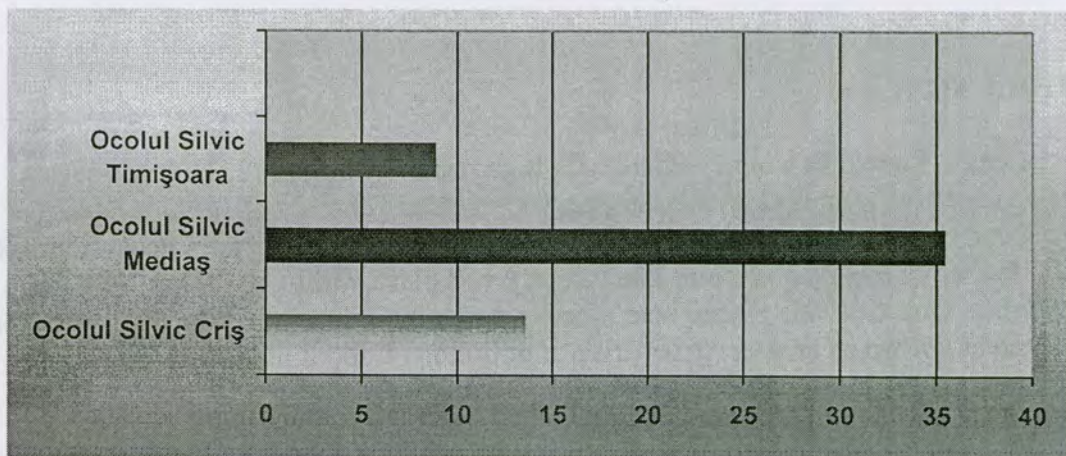


Fig. 2. Lead concentration in water samples during 2005-2009 period

In plants lead concentration was between 2.0 ppm and 2.2 ppm in Forest District C.; between 5.5 ppm and 5.6 ppm in Forest District M. and between 1.8 ppm and 1.9 ppm in Forest District T.



## CONCLUSIONS

- ✓ lead concentrations in soil were in limits for all three Forest District at both depths (20cm and 40 cm);
- ✓ lead concentrations in water were higher than maximum admitted limit not only for drinking water, but also for surface water (0.01 ppm). From ecological point of view all three Forest District were in the Vth class;
- ✓ lead levels were in limits for plants in all three Forest Districts;
- ✓ regarding lead level in soil, water, plants the hierarchy was: Forest District M.>Forest District C.>Forest District T.

## REFERENCES

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