Emphasis on an experimental model in transfer of lead in plants of Morus sp.

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The objective of the paper is to achieve an experimental model to see Pb transfer in plants, Morus sp.

The extraction of heavy metals by accumulation in plants, known as phytoextraction was suggested as an in-situ remediation strategy. Hiperaccumulating plants are able to accumulate high concentrations of metals in their biomass without showing symptoms of phytotoxicity.

The lead is known that when penetrated in the soil it is very difficult to be removed. This metal resists in the layer 0-15 cm from the soil surface, where it is strongly bound by adsorption processes, ionic process, precipitation and mixing with organic matter absorbed.

Fitoextraction commercial purpose is to remove or reduce the level of toxic metals in contaminated soil so that it can meet the standards allowed within a period of 1 to 3 years.

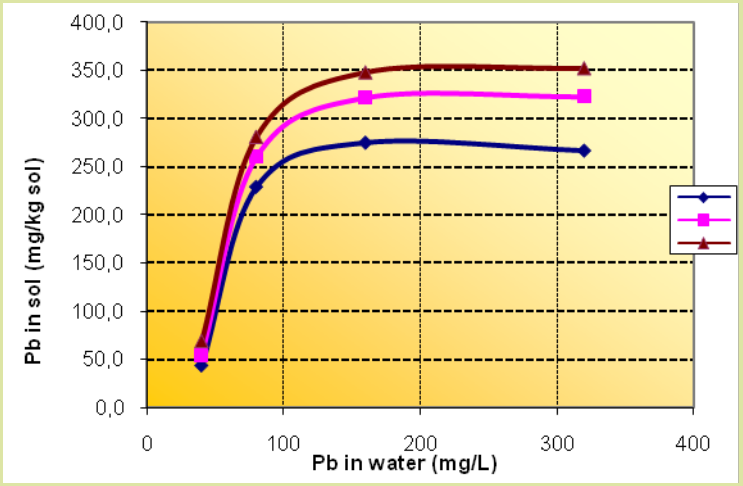
. In summary, a phytoremediation of mining waste arid and semi-arid regions shows high potential. Studies have shown that it is possible plant growth on mining waste, and when it is successful, helps to reduce erosion and stimulates the soil formation processes. Define and understand the phytoremediation process requires long-term studies, aimed at interactions between plants and microbial and physico-chemical characteristics of mine waste, which are subject to the re-vegetation.

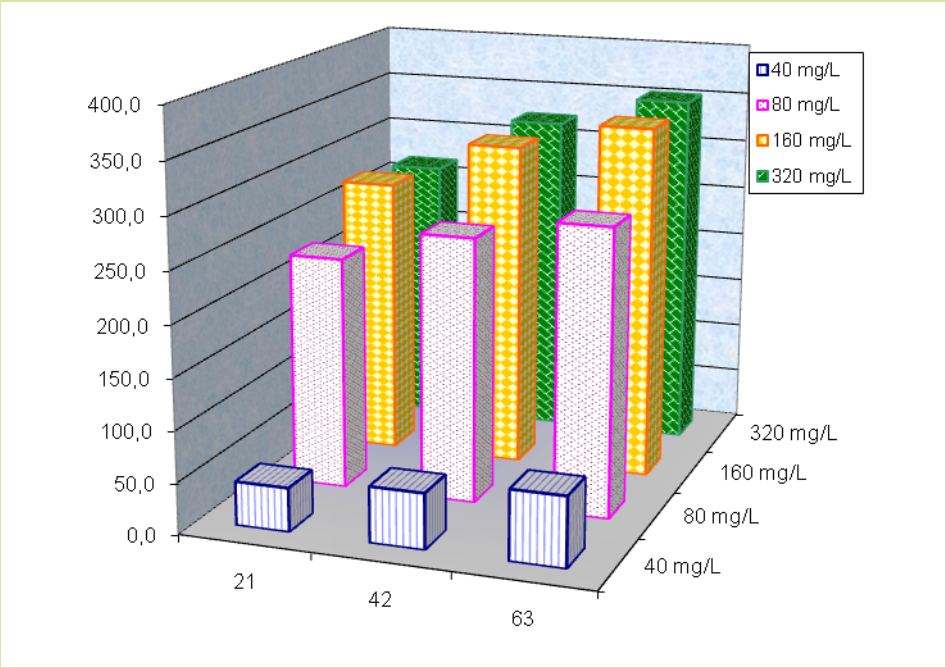
In addition, it is required the availability of information in respect to the metals tolerance of the plant species and the minimum amount needed for plant growth organic amendments and minimum quantities of water.

To study the soil Pb phytoextraction with Morus alba, it was conceived as an experimental model consisted of the introduction of lead in soil with irrigation water, and translocation of Pb phytoextraction from roots to leaves.

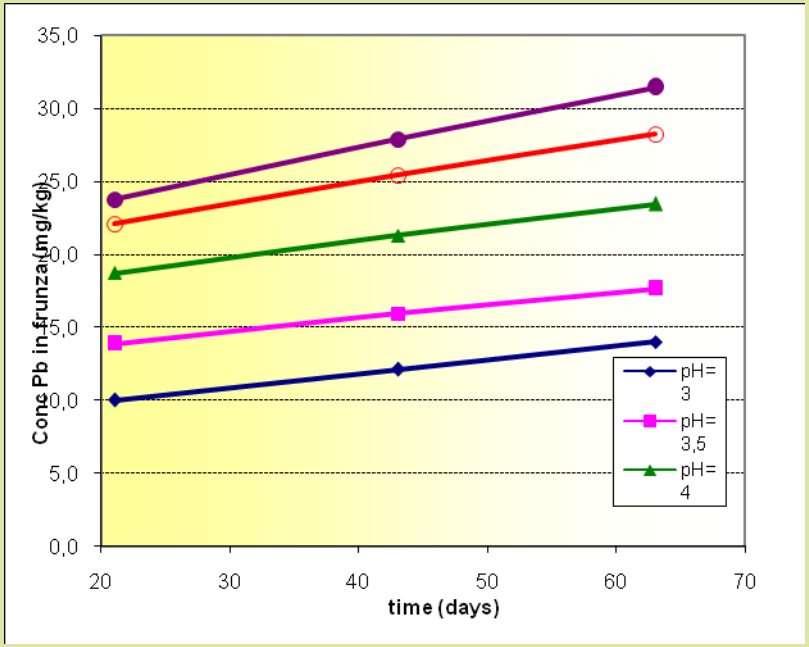
Experiments were carried out with mulberry trees in pots, watered with a solution containing lead. Soil and leaf samples were taken after 21, 42 and 63 days from the start of the experiment. Samples of soil and leaves were dried and crushed by grinding. (<2 mm). After digestion with microwave under pressure (1 g ml sample + 9 HNO 3), the Pb content was determined by atomic adsorption (acetylene flame).

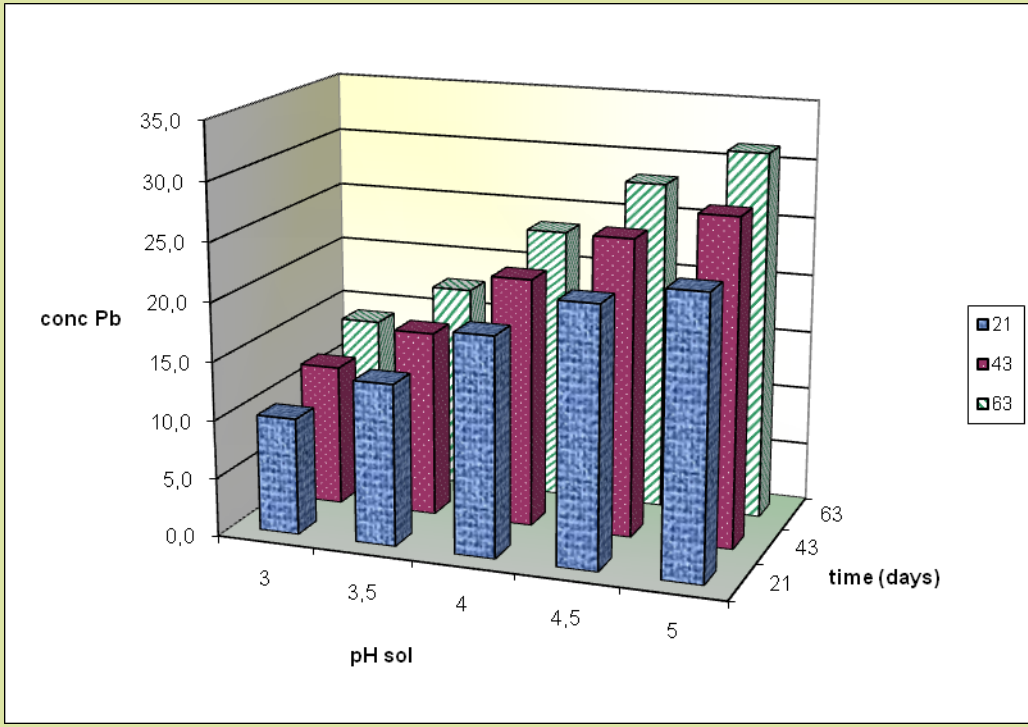
As it can be seen from the two figures , the content of Pb in the soil was increased by the duration of treatment and the concentration of Pb in the water used for watering.





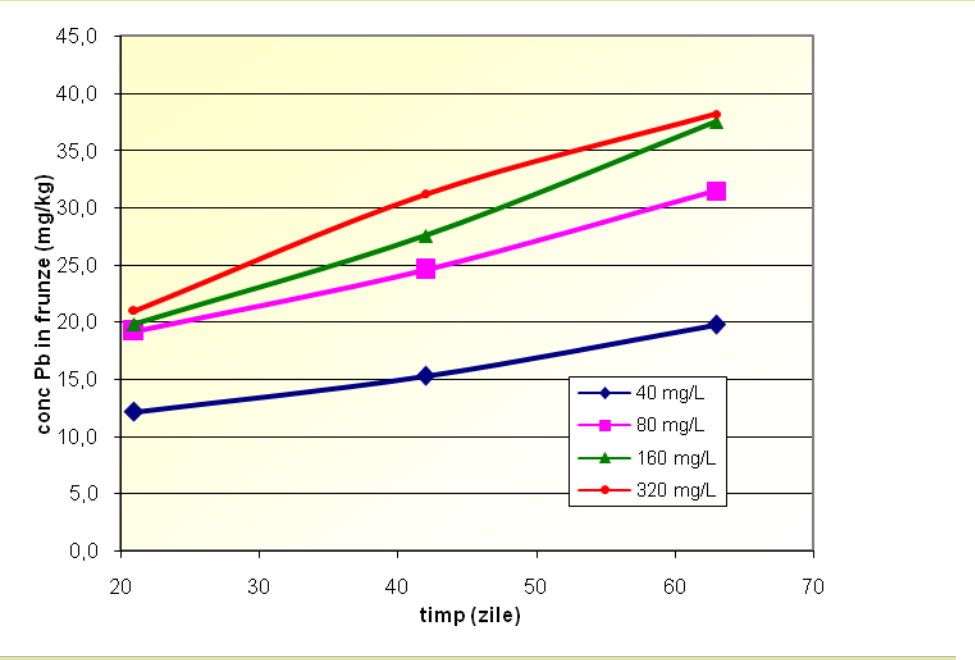
The concentration of Pb in the leaf was influenced by both the concentration of Pb in the soil, the duration of treatment and the soil pH. In the experimental conditions used, the highest concentrations of Pb in leaf were obtained at pH 5.

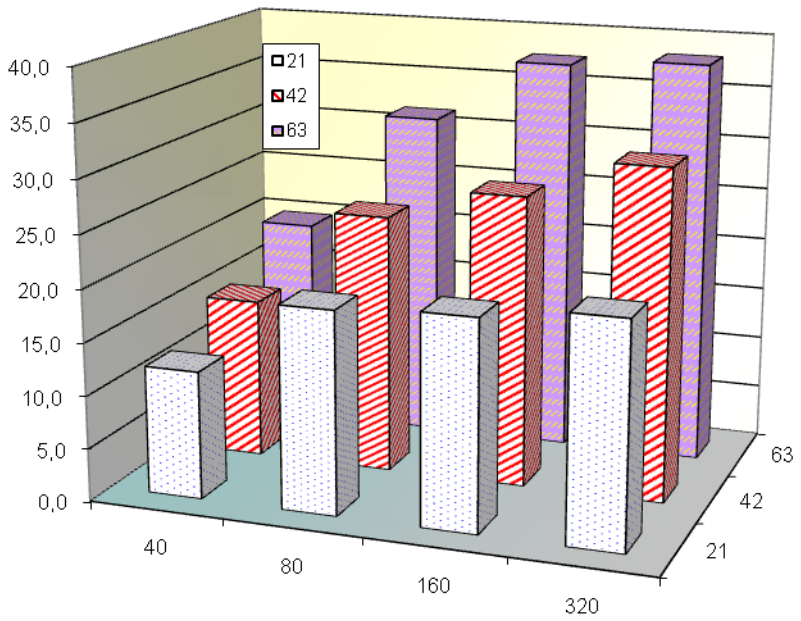




From measurements performed it can be seen that Morus alba is a hiperaccumulating plant for the lead (Pb in leaf maximum concentration of 38.2 mg / kg << 1000 mg / kg).

Through data analysis it was evidenced the influence of Pb concentration in soil, the duration of treatment and the concentration of the soil pH on the lead content in the leaves.





CONCLUSIONS

The concentration of Pb in the leaf was influenced by both the concentration of Pb in the soil, the duration of treatment and the soil pH. In the experimental conditions used, the highest concentrations of Pb in leaf were obtained at pH= 5.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