



Deposition of heavy metals from particulate settleable matter in soils of an industrialized area

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ABSTRACT

Particulate air pollutants from industrial emissions and natural resource exploitation represent an important contribution to soil contamination. These atmospheric particles, usually settleable particulate matter form (which settle by gravity) are deposited on soil through both dry and wet. The most direct consequences on soil of air pollutants are acidification and salinization, not to mention the pollution that can cause heavy metals as components of suspended particulate matter.

The main objective of this study was to evaluate the influence of air pollution in soil composition. For this purpose, has been conducted a study of the composition of heavy metals in the settleable particulate matter in two locations (Almazora and Vila-real) with high industrial density (mainly ceramic companies) located in the ceramic cluster of Castellón (Spain). Settleable air particles samples were collected with a PS Standard Britannic captor (MCV-PS2) for monthly periods between January 2007 and December 2009. We analyzed the following elements: Cd, Pb, Cu, Ni, Sb and Bi which are highly toxic and have the property of accumulating in living organisms. It has been determined the concentration of heavy metals in the soluble fraction of settleable air particles by ICP-MS.

The annual variation of the results obtained in both populations shows a decline over the study period the concentrations of heavy metals analyzed. This fact is associated with the steady implementation of corrective measures in the main industrial sector in the area based on the treatment of mineral raw materials. Moreover, this decline is, in turn, a lower intake of heavy metals to the soil.

REFERENCES

- Gómez E.T.; Sanfeliu T.; Rius J.; Jordán M.M. (2005) "Evolution, sources and distribution of mineral particles and amorphous phase of atmospheric aerosol in an industrial and Mediterranean coastal area" *Water, air and Soil Pollution* 167:311-330
- Moral R., Gilkes R.J.; Jordán M.M. (2005) "Distribution of heavy metals in calcareous and non-calcareous soils in Spain" *Water, Air and Soil Pollution* 162:127-142.
- Pallarés S., Vicente A.B.; Jordán M.M.; Sanfeliu T. (2007) "Study of the levels of concentration of As, Cd and Ni in a ceramic cluster" *Water, Air and Soil Pollution* 180:51-54.