INFLUENCE OF TRAFFIC DISTRIBUTION ON SOME METAL CONTENTS IN URBAN SOILS: "URBAN" AND "NATURAL" ELEMENTS

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In contrast with soils in agricultural areas, soils in urban areas (particularly in parks and gardens) have a direct influence on public health not related with production of food. This is due to the fact that it can come easily in contact with humans and be transferred to them, either as suspended dust or by direct contact. Moreover, even though they are rarely used for agronomic activities, they receive higher than normal loads of contaminants from traffic and, in heavily industrialised cities, industrial activity.

This work presents data of a preliminary stage of a wide study to be initiated in several European cities aimed at defining the main parameters for a comprehensive description of urban soil quality. Among such parameters, the metal contents and availability are especially significant from an environmental viewpoint. Data of a pilot study have already been shown before, and some preliminary results for Seville were also presented elsewhere.

Samples of surface and sub-surface soils from about 30 sites in parks and gardens within the urban area of Seville were collected. The metals extracted by several techniques, including the sequential extraction protocol recommended by the European Union, were determined. The various sets of results were related to several soil parameters that can be expected to have any influence upon metal retention, namely carbonates, organic matter and clay contents. The data were also related to the main expected source of metal pollution by using the density of traffic and its distance to each sampling point.

The results suggest that the contents and availability of some of the chosen metals, namely Cu, Zn, and Pb, seem to be strongly related with urban activity, represented by traffic. Other elements do not show such a relationship. This conclusion agrees with previous observations in the literature of the distribution of trace elements in street dust of cities as thoroughly different as Madrid or Oslo.

The carbonate or organic matter contents are only moderately related with either total or available metal contents, and no relationship is found for the clay content. This result, combined with the dependence upon traffic, suggests that the metal loading is likely to be mainly due to simple deposition from atmosphere, rather than to a chemical reaction with soil components. However, the possibility that some soil components make metal mobility more difficult by bonding the added metals to their surfaces cannot be excluded.