



Incidence of “emerging metals” in soils of a Mediterranean alluvial plain (Valencia Spain)

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In recent years attention are increasingly paid to a group of compounds so called “emerging contaminants” or “contaminants of emerging concern”, under these denomination are included the platinum group elements, uranium and vanadium, among others. One of their characteristics is the scarce information about its toxic effects and environmental dynamics, mainly in soils, and because of that, their possible toxic levels of many of them have not been regulated. As study case, we have selected an important area in Spain that is affected by important anthropogenic pressures.

The target area of study the alluvial plain between the rivers Turia and Jucar (Valencia, SPAIN), with an extension of 486 km², which is characterized by its dense network of channels and ravines for irrigation one of the most productive agricultural areas of Spain. This area includes a wide zone of rice farming and a Natural Park (La Albufera). In the same way, the area suffer an intense human pressure characterized by numerous towns and roads, an industrial belt, high expansion of tourism, etc. In this study area, 33 sampling zones were selected covering the different water sources and agricultural types, to monitor the distribution of the levels of 12 metals of different toxicities, characteristics and origins.

Total concentrations of the selected 12 heavy metals (As, B, Be, Bi, Li, Mo, Se, Rb, Sr, Ti, Tl and V) were evaluated. Standard analytical methods were used to measure soil physical and chemical properties. Total content of the twelve heavy metals, in soil samples, were extracted by microwave acid digestion and determined by ICP-OES.

Maximum average values were determined for Ti, Sr and Rb with 466.36, 263.16 and 63.62 mg/kg, respectively. Highest values for B, Li and Tl were 76.05, 70.91 and 56.37 mg/kg, respectively. The Northern part of the Albufera lake, devoted to rice farming, concentrated the highest values of almost all the selected elements.

The interactions of the metals with soil characteristics and the influence of environmental factors were also studied.

More research is needed to stablish their toxic levels and effects, or even their average concentrations in soils of these elements, very scarcely studied in the majority of them.