



Geochemical background of zinc, cadmium and mercury in anthropically influenced soils in a semi-arid zone (SE, Spain)

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This work seeks to establish the geochemical background for three potentially toxic trace elements (Zn, Cd and Hg) in a pilot zone included in the DesertNet project in the province of Murcia. The studied area, known as Campo de Cartagena, Murcia (SE Spain) is an area of intensive agriculture and has been much affected over the years by anthropic activity. The zone can be considered an experimental pilot zone for establishing background levels in agricultural soils.

Sixty four samples were collected and corresponded to areas subjected to high and similar agricultural activity or soils with natural vegetation, which correspond to abandoned agricultural areas. The Zn content was determined by flame atomic absorption spectrometry. The Cd content was determined by electrothermal atomization atomic absorption spectrometry and mercury content was determined by atomic fluorescence spectrometry. Geostatistical analysis consisting of kriging and mapping was performed using the geostatistical analyst extension of ArcGIS 8.3.

Zinc values ranged from 10 mg kg^{-1} to 151 mg kg^{-1} , with an average value of 45 mg kg^{-1} . Cadmium values ranged between 0.1 mg kg^{-1} and 0.9 mg kg^{-1} , with a mean value of 0.3 mg kg^{-1} and mercury values ranged from 0.1 mg kg^{-1} to 2.3 mg kg^{-1} , with a mean value of 0.5 mg kg^{-1} .

At a national level, the Spanish Royal Decree 9/2005 proposes toxicological and statistical approaches to establish background values. According to the statistical approach, background values consist of the median value for the selected element. The background values for Zn, Cd and Hg in the studied area were 40 mg kg^{-1} for Zn, 0.3 mg kg^{-1} for Cd and 0.4 mg kg^{-1} for Hg.