



Geochemical background of selenium and its possible relation to soil properties

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Selenium is considered as an essential trace element for humans, animals and higher plants. However, at high levels, selenium can be toxic, causing deformities, decreased hatchling survival and causing death to aquatic wildlife and larger animals with increased exposure. Selenium mainly occurs as insoluble elemental (Se^0) and selenide (Se^{+2}) forms, but in oxidizing environments such as aerobic soils, the element is converted to soluble selenite (Se^{+4}) and selenate (Se^{+6}) forms, selenate being predominant at alkaline pH.

This work seeks to establish the geochemical background for selenium in the province of Murcia. Determination of the background soil trace element concentrations is crucial for monitoring the impacts of human activity on the soil chemical quality. The possible relationship between soil properties and selenium concentration has been studied. In the present study, background concentrations were established by analysing a large number of samples soils considered unaffected, or at least minimally affected, by man. Samples were analysed for Se content by atomic fluorescence spectrometry (AFS). Other soil characteristics such as electrical conductivity (EC), organic matter (OM), pH, soluble salts, granulometry and calcium carbonate content were also measured to determine their influence on trace element content. Four different areas were established according to geological composition, and the results suggested that selenium content is correlated with the electrical conductivity.