

Tracing metal pollution sources of plants and soils in Güzelhisar Basin of Aegean Region, Turkey

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The study area Güzelhisar Basin is 6 km far from the city Aliaga, Aegean Region in the west part of Turkey which represents a rather industrialized area having five large iron and steel mills, but also areas of agriculture.

A grid system of 2.5 km to the east and 2.5 km to the west of the Güzelhisar Stream was studied. The area was grouped into three main areas as West, Middle, and East region. Every 500 meters soil samples were taken after the rainfall (April-May) in 2014 from the GPS determined points at 0-30 and 30-60 cm depth.

Soil reaction of the study area was determined within the range from 5.87 to 6.61. Even though, the West and the Middle regions had weak carbonate concentrations, the East region was poor in carbonates and relatively high electrical conductivity was measured. Topsoil contamination was examined by all investigated elements with the exception of Cd. An increase in pseudo total metal contents of Cr, Cu, Mn, Ni, and Zn was observed with the increasing distance from the coast with a simultaneous decrease in pH. Moreover, high plant metal concentrations [mg kg^{-1} , \pm sd] were detected for B [20.7 ± 23.9], Cu [7.99 ± 5.17], Mn (79.3 ± 89.2), Ni (3.50 ± 3.48), and Zn (25.5 ± 20.1). Transfer of the elements from soil to plants increased in the following order: $\text{Co} < \text{As} < \text{Cr} < \text{Pb} < \text{Mn} < \text{Ni} < \text{Cu} < \text{Zn} < \text{Cd} \ll \text{B}$.