Distribution of Cu, Pb and Zn in *Astragalus pycnocephalus Fischer* and *Verbascum euphraticum L.* Plants on Pb-Zn Mining Area in Akdagmadeni, Yozgat, Turkey

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The study area is located in Akdagmadeni where 104 km East of Yozgat city and geologically lies within igneous and metamorphic rocks of Akdag Massive. There are several skarn type Pb, Zn deposits which formed by regional contact methamorphism.

Soil and plant samples were collected from both mineralized and unmineralized areas. The plants *Astragalus pycnocephalus Fischer* and *Verbascum euphraticum L.* were examined. Analysis were carried out by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) method.

Cu, Pb and Zn values of the soil samples were found to be in the range of (A. *pycnocephalus*) 13.1- 418.4 mg kg^{-1}; 29,87- 7839,53 mg kg^{-1}; 48,6- 10000 mg kg^{-1} (V. *euphraticum*) 32.5- 419,4 mg kg^{-1}; 52.96- 9909.13 mg kg^{-1}; 115.1- 10000 mg kg^{-1}, respectively.

Pb and Zn values of most plant samples collected from study area were 10 times higher than the plants from unmineralized areas. Pb and Zn concentration time values were found to be in the range of 463 – 548 mg kg^{-1}; 17.4 – 23.3 mg kg^{-1}, respectively. Translocation factor changed from 0.13 to 4881. Enrichment coefficient of most plant samples were lower than 1. A.*pycnocephalus* and V. *euphraticum* can be used as hyperaccumulator plants for both Pb and Zn. However, these plants cannot be used as hyperaccumulator for Cu.

Keywords: A. *pycnocephalus*, Akdag Massive, Contact Metamorphism, Hyperaccumulator, Pb-Zn Deposit, V. *euphraticum*.

The late Ediacaran (605-580 Ma) anorogenic alkaline magmatism in the Arabian–Nubian Shield: A case study of the Serbal Ring complex, south Sinai, Egypt

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The Serbal pluton is late Neoproterozoic (605-580 Ma) post-collisional A-type granites in southern Sinai, Egypt (northernmost Arabian–Nubian Shield, ANS). It is characterized by discontinues ring-shaped outcrops that was later dislocated by a faults. The Serbal pluton intrudes late Neoproterozoic metamorphic and calc-alkaline rocks. The majority of Serbal pluton is composed of alkali feldspar granite and riebeckite granite with gradational contacts; the former represents the outer zone, while the latter represent the inner zone. The Serbal granites include wide variations of accessory minerals including zircon, apatite, titanite, Fe-Ti oxides, fluorite, allanite, pyrochlore and samarskite. The Serbal granites are highly evolved in composition (75.98-78.52 wt.% SiO_2) and display the typical geochemical characteristics of A-type granites with high SiO_2, Na_2O+K_2O, FeO*/MgO, Ga/Al, Zr, Nb, Ga and Y and low CaO, MgO, Ba, and Sr. They are rich in REE than monzogranite (country rock) and show extreme Eu-negative anomaly (Eu/Eu* = 0.01-0.23). The peralkaline to peraluminous characteristics of the Serbal granites suggested that they have been evolved through different differentiation trends which controlled by varying fluorine contents of the parent magma. The chemical characteristics indicate that the riebeckite granite shares in many features of granites with the tetrad REE effect which manifested by the very low ratios of Eu/Eu*, (La/Yb)n, La/N, Zr/Hf and K/Rb and by the very high K/Ba. The Serbal granites exhibit an alkaline nature of within plate tectonic setting, while the monzogranite of country rocks displays calc-alkaline characteristics of island-arc tectonic settings. The Serbal pluton evolved through fractional crystallization of a parental magma derived through partial melting of juvenile crustal protolith. This crustal protolith has been extracted from a source having geochemical and isotopic data similar to those of the mantle origin. Mineral geothermometry points to the formation of the silicic magma of the Serbal granites at high temperatures, up to 650–850^{O}C at a shallow depth of emplacement (<10 km). This magma erupted after the end of the Pan-African orogeny due to the thinning and extension of continental crust. This stage is characterized by the sudden and radical change from typical subduction-related calc-alkaline magmatism to post-tectonic alkaline (peralkaline) magmatism.

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