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Geochemical assessment of soil potentially toxic elements from Copou – Iaşi vineyard area (NE Romania)

Doina-Smaranda Sirbu-Radasanu[1], Ramona Huzum[1,2], Simona Petronela Iftode[2], Gabriel Ovidiu Iancu[2], Nicolae Buzgar[2]

[1] "Alexandru Ioan Cuza" University of Iaşi, Department of Research, 20A Carol I Blv, 700505 Iaşi, Romania

[2] "Alexandru Ioan Cuza" University of Iaşi, Department of Geology, 20A Carol I Blv, 700505 Iaşi, Romania

Abstract

The Copou-Iaşi area is one of the oldest from the well-known vineyard region of Moldavian Platform (Eastern Romania). A number of 36 plots soil samples were systematically collected from a 0–40 cm depth. Soil profiles nearby the plots were sampled for the geochemical assessment of potentially toxic elements (PTE), using deep soil layers as controlled reference samples. The collected samples were analyzed for a series of 18 elements using ED-XRF method. The assessment of soil contamination was carried out by PCA multivariate statistic method and some geochemical indices (EF, AC,CF, CD) were calculated in addition. The obtained data shows an enrichment of PTE for the upper soil layer and denote an anthropogenic source due to the specifically disturbance of vineyards soils. Comparing to the Romanian legislation in force Cr, Ni, Pb and As exceed the normal values, but are within the alert threshold. Only Cu content exceed the Romanian alert threshold. A special attention is required in case of Cu and Cd due to their largest anthropogenic fraction, which increase the toxicity risk. The interaction between organic matter and PTE as result from PCA suggest that the toxicity risk is controlled by the stability of physico-chemical properties of vineyard soil.

Keywords: vineyard soil, Copou-Iaşi, PTE, PCA, contamination, geochemical index, ED-XRF.

Corresponding author's e-mail: sradasanu@yahoo.com