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MULTIVARIATE STATISTICAL METHODS IN DETERMINING THE SPATIAL DISTRIBUTION OF CHEMICAL ELEMENTS IN SOIL FROM THE PRESPA REGION, NORTH MACEDONIA

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Abstract

In this work, the results of the study of the distribution of 18 elements (Ag, Al, Ba, Ca, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Ni, P, Pb, Sr, V, and Zn) in the soil of the Prespa Region, North Macedonia, are presented. For this purpose, a total of 68 soil samples were collected from 34 different locations (34 samples of topsoil and 34 samples of subsoil). After total digestion, the samples were analyzed by atomic emission spectroscopy - inductively coupled plasma (ICP-AES). Special attention was paid to the distribution of Cr, Fe, Mg, Ni, and V. It was found that the highest contents of these elements are found in the soil samples from some areas of the Baba and Bigla Mountains, which is due to the lithogenic origin, since in this area there are mainly Paleozoic shales and magmatic and volcanic rocks, and therefore the contents of copper, lead, iron, and zinc are increased compared to European values. By applying factor analysis, 3 geochemical associations were identified: Factor 1 (Ni-V-Fe-Cr-Cu-Zn-Mn-Mg); Factor 2 (Mg-Sr-Na-Ca-Al), and Factor 3 (Ba-Pb-K). From these studies, it can be concluded that the distribution of these samples follows the geology of the region, and their contents are increased in certain areas of lithogenic origin. Characteristic of the Prespa region is that the content of copper, lead, iron, and zinc is elevated compared to the European values, because in this region there are mainly Paleozoic shales, Mesozoic, and Paleozoic carbonates and plutonites.

Key words: chemical elements, distribution, North Macedonia, Prespa Region, soil

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