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GEOCHEMICAL EVALUATION OF THE NATURAL ENVIRONMENT IN THE AREA OF NATIONAL PARK VANTURARITA-BUILA

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Introduction

In the present study, the geochemical evaluation of the natural background was carried out, in a protected natural area, in order to establish some reference thresholds for the soil and water environment components. The evaluation is based on thorough investigations carried out in this protected natural area chosen as a case study. The area is outside the area of influence of anthropogenic activities, the main factors of influence being: geological, geomorphological, edaphic and climatic.

Areas of the National Park Vanturarita-Buila located in the central-northern part of Valcea County were studied. The soils from the National Park Vanturarita-Buila are mostly formed on a calcareous substrate, they do not show a great diversification, being different only due to the type of vegetal associations that were formed on them. The entire hydrographic network of the Vanturarita-Buila Massif through its direct or indirect right tributaries, with a course direction, flows into the Olt River, broadly speaking, from north to south.

Materials and methods

Sampling was performed with appropriate equipment: Eijkelkamp pedological drill for soil samples, Burkle telescopic sampler for water samples.

Sampling techniques and methods of analysis were performed in compliance with sampling standards and method in accordance with national legislation.

A series of sampling points located in areas from the outer perimeter of the protected areas were also chosen to highlight the anthropogenic pressures on the soil and water environmental factors.

The geographical location was made with a GPS receiver, model Montana 610 from the manufacturer Garmin. The samples were sampled, labeled and properly preserved, then they were brought to the laboratory for processing and performing the analytical tests.

For quality indicators were used analytical purity reagents analyzed for water and soil samples and the methods used were: electrochemistry (Thermo Scientific Orion Star A 215 multiparameter), gravimetric (Precise Balance XB, Memmert Oven) spectrophotometric (Specord 210 Plus) and inductively coupled plasma optical emission spectrometry (ICP-OES Perkin Elmer Optima 5300DV).

Results and conclusions

The objective of the study was to evaluate the water and soil environmental factors in the area of the National Park Vanturarita-Buila.

In the spring of 2021, samples were taken from 8 points for the water environment factor (springs and surface water) and from 6 points for the soil environment factor.

The quality indicators determined for the soil environmental factor were: pH, humus, Kjeldahl nitrogen, iron, arsenic, barium, cadmium, cobalt, total chromium, copper, manganese, molybdenum, nickel, lead, selenium, antimony, vanadium, zinc and potassium.

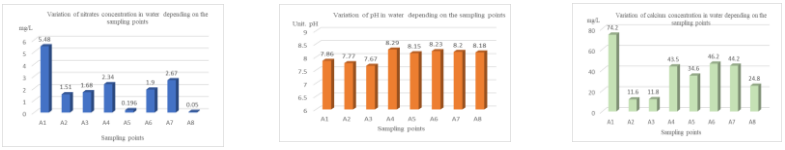

Fig.1. Variation of water quality indicators depending on sampling points in the Vanturarita-Buila National Park area

In the figure 1 was illustrated the graphical representation of the quality indicators of the sampled water. Regarding the results obtained, the pH value was between 7.67 – 8.23 units. pH being in a neutral range, the minimum obtained for the nitrogen parameter was lower than 0.05 mg/L and the maximum was of 5.48 mg/L. The concentrations of calcium varied between 11.6 mg/L and 74.2 mg/L, the calcium content of the waters in this analyzed area corresponds to the specific mineralization of the karst areas indicated by the specialized literature.

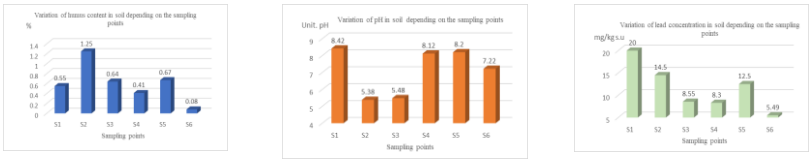

Fig.2. Variation of soil quality indicators depending on sampling points in the Vanturarita-Buila National Park area

The results were correlated and interpreted according to the data obtained in the field research. The graphical representation of the soil quality indicators was presented in figure 2. The obtained results indicated the following conclusions: the pH value was between 5.38 and 8.20 units, pH being in a slightly acidic range. The minimum percentage obtained for the humus indicator was 0.41% and the maximum was 1.25%. Moreover, he concentrations of the lead quality indicator varied between 5.49 mg/Kg s.u and 20 mg/Kg.s.u.

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