COMPARATIVE ANALYSIS AND VEGETATION CHARACTERISTICS OF SOIL-PLANT COMPLEXES OF THE BASTAK NATURE RESERVE

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Introduction. The study of soil-plant complexes and their participation in the processes of accumulation of various elements is of considerable theoretical and practical interest for characterizing the environmental conditions of protected natural areas. Here the features of the species composition of communities and their binding to soil types and terrain characteristics in the Bastak Nature Reserve are addressed as a basis for further ecological and geochemical monitoring of this territory.

The main part. The object of the study is the vegetation of the Bastak Reserve, located in the Jewish Autonomous Region. The predominant type of vegetation of a specially protected natural area is larch forest [1]. Field studies for the purpose of ecological and geochemical assessment of natural and disturbed ecosystems were carried out in the period 19.06.2022 - 27.06.2022.

When describing communities, the following information and dimensions are collected: geographical location, geomorphology, description of the grass layer (includes drawing up a complete species list, determining the total cover of the grass layer and each species in percentage) [2]. Each test point was also described in relation to the type of soil, of which brown-taiga and brown forest soils were predominant. For description of the grass layer, on each test site (1 square meter area), the species composition of vegetation and the projective coverage of species as a percentage were determined on the spot. Then the data on the species composition is formed in the form of tables in which the rows correspond to the species, and the columns correspond to the samples (sites). This format allows us to calculate various indices, analyze the similarity of the species composition of communities in relation with environmental factors at different test points, and apply statistical analysis.

One of the stages of data analysis was its classification and grouping according to the principle of similarity of the compared communities. Since the organization of data is the same for different communities, its entire set (a total of 15 occurrence matrices) was analyzed in relation to five routes. The values of the dissimilarity between each pair of occurrence matrices were calculated (in this case, the Euclidean distance metric was used) and a common distance matrix was obtained, on the basis of which a cluster analysis was carried out by the average linkage method using R Studio packages [3].

Conclusions. The geobotanical description of the communities on the trial sites of the five routes made it possible to identify the most common plant species for each of the sites and for the studied territory as a whole. Cluster analysis of the main characteristics of communities showed not only their similarity related to the territorial location and habitat conditions, but also revealed not obvious similarities of communities located on completely different sections of routes.

In further studies, when obtaining data on the content of chemical elements (heavy metals specifically) in plants and soil samples in these areas, it will also allow a comparative analysis of communities based on the accumulation of heavy metals by soil-plant complexes of the Bastak Nature Reserve.

List of sources used:

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3.   R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, 2020.