

ness is equivalent to drugs and is considered an element, without which the normal course of redox processes in the body is impossible [4].

The results of the studies on the detection of vitamins C, PP in the leaves of common dandelion are shown in the table.

Table – The amount of vitamins in the leaves of *Taraxacum officinale*.

Vitamins Gathering place	C (ascorbic acid) Mg	PP (nicotinic acid) mg
The territory of the botanical garden	0,2817±0,1358	0,0826±0,0263
The territory of the main building of the university	0,2302±0,0941	0,0652±0,0382

The table shows that the content of ascorbic acid in extracts from the leaves of *Taraxacum officinale* is higher than the content of nicotinic acid. More favorable conditions have been created on the territory of the botanical garden, therefore the content of vitamins is higher there.

Conclusion. The roots of the common dandelion are the pharmacopoeial raw material for the Republic of Belarus. When they are harvested, the leaves are discarded. However, due to the high content of vitamins C and PP in the leaves of common dandelion and other biologically active substances, they can be used in the creation of cosmetics and pharmaceutical substances.

1. Tolkunova, N.N. Investigation of the chemical composition of plant extracts / N.N. Tolkunova // Meat Industry. – 2003. – No. 12. – P. 30–31.
2. Big atlas of medicinal plants / N. Safonov. – M.: AST, 2018. – 340 p.
3. Horse, I. Ya. Vitamin C / I.Ya. Horse, S.G. Verinikina / Russian Chemical Encyclopedia / Ch. ed. I.L. Knunyants. – M., 1988. – T. 1. – S. 382–385.
4. Berezov, T.T. Biological chemistry / T.T. Berezov, B.F. Korovkin. – M.: Medicine, 1998. – 704 p.

ASSESSMENT OF VARIATION IN THE GEOLOGICAL ENVIRONMENT OF THE VITEBSK TERRITORY

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Keywords: technogenic changes, geological environment, state of the city's geosystem, degree of disturbance, confinement to functional-territorial zones, ecological functions of the geosystem.

The history of the development of the territory of Vitebsk is inevitably associated with technogenic changes in the structure and components of the natural environment. This is primarily due to changes in the lithogenic base or geological environment, which forms a set of ecological functions that determine

and reflect the role and significance of this geosystem, including its composition, volume, dynamics of functioning, geochemical and geophysical fields, in the life support of humans and other organisms.

The purpose of the research is to assess the change in the geological environment of the territory of Vitebsk.

Material and methods. The work is based on the results of complex geological studies in the city, conducted by the authors in 2019–2021 as part of a research team from among teachers and students of VSMU and VSU named after P.M. Masherov. In the course of the work, comparative geographical, expert, descriptive and geoinformational methods were used.

Findings and their discussion. Our assessment of changes in the state of the city's geosystem or the degree of its disturbance made it possible to identify three categories of land. There are no unchanged or undisturbed lands on the territory of Vitebsk. Slightly altered (weakly disturbed) areas are characterized by the inheritance of the composition, structure and specificity of the manifestation of the ecological functions of the geological environment, close to its natural state. The zone of anthropogenic impacts in comparison with other districts of the city is weak and discontinuous here. The area of distribution of these areas is insignificant, they are identified only in certain areas. These plots are located in all functional-territorial zones of Vitebsk and are confined mainly to forest parks, parks, forest and swampy areas and other ecosystems, partly to residential estates and summer cottages. They are characterized by a high and medium degree of stability of the city's geosystem, contributing to a very weak manifestation of surface and underground pollution of the components of the geological environment. In weakly disturbed territories, predominantly natural geological processes have spread: plane washout, gully and river erosion, creep, landslides, suffusion, flooding and waterlogging. Of the existing ecological functions of the geosystem, the geochemical function, expressed by the formation of geochemical zones with a low level of contamination of soils and grounds of the aeration zone, can partly undergo transformation. In some parts of the river valleys during the flood period, there is a certain risk of biological pollution.

Moderately altered (or moderately disturbed) territories in the city are characterized by a slightly larger areal distribution compared to weakly altered areas. The nature of the transformation of the geological environment here largely depends on the type of economic development of territories. Moreover, if weakly disturbed areas, as a rule, do not change their resistance to technogenic impacts, then the average degree of disturbance is sometimes accompanied by its decrease. Moderately disturbed geosystems are present in all types of the structure of the geological environment and functional-territorial zones of Vitebsk. Within these territories, there are plots mainly with residential estates and summer cottages, in some cases (mainly on a finite moraine hill), garage buildings. The relief here is subject to minor planning. Despite this, the resistance of moderately disturbed lands to technogenic pollution can vary from a low to a high degree,

with a predominance of its average level. In some areas, chemical pollution of soils, surface and ground waters is possible, which is an expression of the transformation of the geochemical function of the geosystem. In addition, due to the presence of household plots within these types of buildings, there is also a risk of biological contamination of the components of the geological environment. Among the modern exogenous processes expressing the geodynamic ecological function of the geoenvironment, predominantly natural geological processes have also developed here (locally, in small areas): plane washout, gully and river erosion, creep, landslides, suffusion and flooding.

Particularly noteworthy are the heavily altered (or severely disturbed) territories, which occupy about 70% of the city's area. The zone of anthropogenic impacts here reaches considerable thickness and is characterized by relative constancy. Like the previous categories of land, these territories are present in all types of structure of the geological environment and functional-territorial zones of Vitebsk. Plots of all types of buildings are located within them. This is practically all multi-apartment residential and public buildings in their various combinations, all industrial and communal storage facilities, transport highways, most of the residential estates and summer cottages. The relief in these territories is mostly planned. The stability of the geosystem here is low and medium, which often leads to a significant transformation of its ecological functions. Significant areas of noise impact, thermal, chemical and biological pollution, reaching medium and moderately hazardous levels, have been recorded here. Soils, surface and underground waters are often contaminated. The active manifestation of exogenous geological and especially engineering-geological processes, among which are gully erosion, suffusion, flooding, waterlogging and peat accumulation, also contributes to a strong disturbance of lands here.

Thus, the analysis carried out indicates that only small areas remain weakly altered or slightly disturbed within the city, inheriting the composition, structure and features of the manifestation of the ecological functions of the natural geological environment, which is close to its natural state. The main part of the city's geosystem is undergoing significant changes. Engineering and economic activities lead to a significant transformation and decrease in the quality of the ecological functions of the geosystem, thereby contributing to the occurrence of physical, chemical and biological pollution of the components of the geological environment.

Conclusion. The results obtained can be used for a comprehensive assessment of the geoecological state of the territory of Vitebsk, and the change map is used as a basis for creating a cartographic model of the geoecological situation.