– To identify the index of anthropogenic load.

– To identify the level of air pollution in Minsk Druzhby Narodov Park using bioindicational method.

For solving these problems we have used the methodologies and tasks from the self-guided practicum for first year students of the faculty of ecological medicine of Minsk State ecological university by E. U. Zhuk, O. V. Kolesneva, A. V. Kamornikova.

Methods where use:

– routing method of research

– the method of green plantation estimation

– lichenoindication method

Routing method of research was used for revealing the presence of life forms of organisms, ecological groups, phytocenosis, their diversity and occurrence on the researched territory. The main techniques were: direct observation, estimation of condition, description and mapping.

Using the bioindication method with lichens, the projective cover and the degree of coverage on the tree stands of the park were assessed.

As the result of our research have been identify that Druzhby Narodov Park in its condition has 2 out of 3 possible points. We also have estimated the ecological condition of the park, and have given the ecological assessment of the park as a recreational area. It's necessary to improve the infrastructure of the park as a recreational area that will protect trees plantations and reduce the level of anthropogenic load on the park biotypes.

GAMMA-RAY BURST AS POSSIBLE CAUSE OF LATE ORDOVICIAN MASS EXTINCTION

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The study considers the phenomenon of gamma-ray bursts, their classification, main characteristics and origin. The biological effect of gamma-ray bursts occurring in our galaxy relatively close to the Earth, atmospheric and other changes caused by them are also considered. Causal links between gamma-ray bursts and Late Ordovi-cian mass extinction have been constructed.

Keywords: gamma-ray bursts, cosmic rays, Ordovician extinction, biosphere.

Gamma-ray burst (GRB) is an extremely energetic flux of electromagnetic radiation with an energy of the order of 10–1000 keV. This radiation propagates in interstellar space. The main parameters of GRB is the fre-quency of occurence, intensity, duration, spectrum of radiation and evolution during the burst, and also the total flux of energy and . the direction of propagation of radiationю

There are two general subclasses of GRBs. The first subclass is the "short" GRBs which appears as a result of two neutron stars fusion. The second subclass is the "long" GRBs. These GRBs emit the two relativistic jets in result of massive stars gravitational collapse.

Recent observations have shown that the total flux of energy by impulse account on average 10^{-4} erg/cm^2. The range of observed fluxes lies in the region of $3\cdot10^{-6}$–$5\cdot10^{-4}$ erg/cm^2. The frequency of occurrence is about five times per year in celestial sphere. Obvious anisotropy of GRBs is not detected. Duration of GRBs varies from 0,1 to 80 seconds. The time of intensity fluctuations can reach 0.01s. The spectra of GRBs can be approximated by exponential function $F(E)\backsim\exp(-E/E0)$, where is $E0 \sim 150$ keV.

Based on various estimates, the dangerous approach of the Earth to GRB occurs on average 2–3 times per billion years. X-ray and γ-radiation of GRB can be detected on Earth by the effect on atmospheric layers. Ioniza-tion is created in the lower ionosphere which should lead to phase shift of long-wave radio signals and additional absorption of radio waves. The effect on the upper atmosphere is also manifested in fluorescence. In the upper atmosphere, during interaction of cosmic radiation with nuclei of atoms included in molecules of atmospheric gases, flows of secondary particles are created. Some of these particles are involved in the creation of 14C and 10Be radioactive isotopes that reach the Earth 's surface by carbon cycle (14C) or by rain and snow (10Be). Ions created by cosmic radiation increase the number of low-altitude clouds that occur. Atmospheric "rains" of charged particles created by cosmic rays cause lightning discharges in the atmosphere. These "showers" create NO and NO_2 by direct ionization of molecules that destroy ozone faster than it is created in discharges. Decreasing ozone in the atmosphere results in increased UV-radiation on the surface. The decay of secondary mesons created by streams of

charged particles results in high-energy penetrating muons that reach the ground and penetrate deep underground and underwater. A small proportion of protons and neutrons from the flux, which increases with the energy of the initial cosmic particle, also reaches the surface. In general, highly permeable secondary muons are responsible for about 85 % of the total equivalent dose that cosmic rays deliver at surface level. Their interactions, and the interactions of their products with electrons and nuclei in living cells, ionize atoms, break down molecules and damage DNA and RNA due to the displacement of electrons, atoms and nuclei from their places. The total energy dose released from penetrating muons, which results in 50 % mortality within 30 days, is 2,5 to 3 Grey.

There is a theoretical correlation between GRB radiation and mass extinction of biota on Earth occurring at least five times in history. It is assumed that GRB could have contributed to the Late Ordovician mass extinction that occurred about 440 million years ago. The Earth 's biota has been exposed to increased levels of ultraviolet radiation, associated mainly with ozone layer destruction. Then came the late Ordovician Ice Age, associated with an increase in the concentration of nitrogen dioxide NO2 in the atmosphere and its absorption of solar radiation in the visible region of the spectrum.

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WETLAND BIRDS OF MINSK AS A POTENTIAL FOCUS OF CERCARIOSIS

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Mass species of wetland birds were explored as a potential focus of cercariosis. The estimation of the number and population density of wetland birds was made in different parts of the Svisloch. Recreation areas which are the most dangerous for the citizens have been identified.

Keywords: wetland birds, cercariosis, urbanization loading, schistosomicide invasion, urban landscape, recreation area.

One of the priority areas of research made by ornithologists is the study of wetland birds in urban areas. Cities are attractive for wetland birds due to the presence of favorable living conditions on their territory.

The main issues in the study of wetland birds are: species composition, nesting ornithofauna, adaptation to the urban landscape, species which are left for winter and the biology of individual species. At the same time, researches on cercariosis in Minsk don't get enough attention. Such researches gets special attention only in cases of the exacerbation of the problem of cercariosis in urban landscapes and recreation areas. The problem of cercariosis is a worldwide problem [1].

Cercariosis, or swimmer's itch, is a skin lesion by cercariae – larvae of flatworms of trematodes. Although cercariosis is not a very serious disease, but it can completely ruin your vacation and show itself for a long time. This issue is especially acute in the resort area of the Narochansky region, which main feature is the concentration of a large number of people on the coast. Local birds have developed a special type of behavior, which is unusual for