

difficult land relief, artificial obstacles and the roughness of the surface will allow to predict more precisely and fully the distribution of the emissions from the nuclear power plant.

Mathematically, the process of the convective heat transfer and the movement of gas in the atmosphere is described by the Boussinesq approximation. This model includes the Navier-Stokes equation, the heat equation and the continuity equation. The main idea of approximation consists in particular accounting density depending on the temperature.

As a modeling tool the modern software package COMSOL Multiphysic is selected. This software allows to consider geographical and climatic features of the chosen site, and also to set all necessary elements of infrastructure of the NPP. To solve the partial differential equations, COMSOL Multiphysics uses the finite element method. An important advantage of COMSOL Multiphysics is that this package contains a set of ready-made modules for different fields of physics. The Heat Transfer module contains simulation tools to study the mechanisms of heat transfer – conduction, convection, and radiation. This module was used for the solution of the objective

As a result of the simulation were obtained temperature fields in all directions of the wind and for various external weather conditions. Because Temperature has a direct effect on the humidity level around the nuclear power plant cooling towers, it was built a map of average land value increment specific humidity.

Analyzing the results of calculations we can conclude that heat and humidity outputs of cooling stacks in NPP with described characteristics will not impact greatly on the microclimate of the nearby territory because average annual ground temperature and humidity increase is insufficient.

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USING TRIFOLIUM REPENS AS BIOINDICATOR OF ENVIRONMENTAL QUALITY

A bioindicator is any biological species (an "indicator species") or group of species whose function, population, or status can reveal the qualitative status of the environment. Bioindicators can be plants, animals or microorganisms.

The use of bioindicators is fundamentally different from classic measures of environmental quality and offers numerous advantages. Bioindicators add a temporal component corresponding to the life span or residence time of an organism in a particular system, allowing the integration of current, past, or future environmental conditions; they can also indicate indirect biotic effects of pollutants when many physical or chemical measurements cannot. In most cases they are inexpensive compared to chemical methods.

Many plant species are good indicators of pollution, because they are acutely tuned into and affected by their environment. Under exposure to high concentration of pollutants, plants suffer acute injury with externally visible symptoms, such as chlorosis, discolouration, necrosis and death of entire plant. Besides morphological changes, biochemical, physiological and fine structural changes also occur in plants.

The object of the study was the widespread bioindicator *Trifolium repens* (creeping white clover). In this work was considered the phenomenon of genetic polymorphism of *Trifolium repens*. Populations of white clover are characteristically polymorphic for white leaf marks. The white marks appear as bands on the laminae as a result of air spaces within the palisade tissue. This trait is genetically determined and inherited as a monogenic. Two linked groups of genes control leaf marking in *Trifolium repens*; the white leaf marks are controlled by multiple alleles at a locus in one of these groups. The ratio of different phenotypes of bioindicator plants allows to make conclusions about the magnitude of the accumulated mutations cargo of organisms in various conditions of anthropogenic load.

The collection and identification of plant materials was performed during the flowering period (June-July). A total of 2 100 plant specimens were collected from 21 plots on the territory of Minsk and International Environmental Park "Volma".

In a study of genetic polymorphism 23 phenotypes of white clover were found (on average, from 7 to 10 phenotypes within a natural population of white clover). In all populations the predominant genotypes were vv, Vv, VV and VHVH. It was found that the lowest degree of vv phenotype was observed on the territories with high anthropogenic loading (11% – Alibegova st., 17% – Vaneeva st., 19% – both Taschkentskaya st. and Masherova av., 21% – Fizkulturnaya st.). And, on the contrary, the highest degree of vv phenotype was observed in uncontaminated areas, such as Zaparojskaya st. – 48%; Independence av. – 50% and the territory of International Environmental Park "Volma" – 53%. In the conditions of high anthropogenic load was noted the presence of atypical leaf blades as the result of mutations (from 1% to 3% at different plots). The reason for such differences may be contradictory proximity of some recreational areas to the city's transport lines and acting companies in the petrochemical, power, machine building, building materials, etc.

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ASSESSMENT OF SYSTEM OF WATER SUPPLY AND SANITATION RUE "NATIONAL AIRPORT "MINSK"

The main activities of the company related to servicing aircraft, passengers, baggage, cargo and mail, rendering of services for commercial aircraft maintenance and security of passengers on-Board meals.