

Species of genus *Bombus* are polythrophic pollinators of flowering plants, *Tetralonia macroglossa* Rossi were registered on Malvaceae plants only in other places, *Halictoides dentiventris* Nylander prefer to visit inflorescences of plants from Campanulaceae family.

All of these species were registered on the inflorescences of malva for the first time in Belarus.

In this way, there were 5 species of Hymenoptera marked as visitors of the inflorescences of *Malva alcea* L., which belong to the Apidae, Anthophoridae and Halictidae families. In the future we are planning to continue our research, including pollen cargo analysis.

**Kovalev V., Zhuraukou E., Goncharova N.**

*International Sakharov Environmental Institute of Belarusian State University,  
Minsk, Republic of Belarus*

### **EVALUATION ABSORBED DOSES IN GENERATIVE ORGANS POPULATIONS OF SCOTS PINE IN NAROVLYANSKY AND FORESTRY VIETKA**

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The purpose of research – evaluation of absorbed doses in the generative organs of pine populations in Narovlya Vetka forestry. Studied experimental plots are contrasting level of radioactive contamination, but the background on the physico-chemical properties and heavy metal contamination. The largest contribution to the absorbed dose plant generative organs makes  $^{137}\text{Cs}$ . Dose rate in experimental plots ranged from 7 to 140 mGy / year, compared to 0.14 mGy / year in the control plot.

To calculate the radiation dose to the generative organs of pine trees used a specially designed dosimetry model. To calculate the radiation dose generated by  $^{137}\text{Cs}$   $\gamma$ -rays, forest ecosystem has been divided into 5 zones on the vertical profile. Three upper zones are elevated part phytocenosis, others characterize forest litter and soil layer thickness of 5 cm.

In developing the conceptual scheme dosimetric models made the assumption of a uniform distribution of radionuclides within each zone. Thus, each of the zones shown in Figure 1 viewed as a source of an infinitely long (endless “plate”) with a uniform distribution of activity. The objects for which the estimated radiation doses – generative organs of pine trees, are concentrated within the uppermost zone called “the crown of woody plants.” This zone is a collection of two thick endless radiation sources, one of which is located above and the other - below the level at which the selection was carried out of the generative organs of pine trees. When calculating the dose rate, radionuclide formed by gamma-radiation, distributed within the areas “woody plants Crowns”, “Under crowns layer”, and zones that simulate layers of soil-litter system, using an idea – “a source in the form of thick plates for protection.” In this case considered as protection layers disposed above the source layer.

Studied experimental sites are contrasting the level of radioactive contamination, but on the background of physical and chemical properties and contamination with heavy metals. The largest contribution to the absorbed dose of generative organs of plants making  $^{137}\text{Cs}$ . Dose rates in experimental plots ranged from 7 to 140 cGy / year, compared to 0.14 mGy / year in the control plot.

**Kresova E.<sup>1</sup>, Kundas S.<sup>2</sup>, Suprinovich Yu.<sup>3</sup>, Kuzhelko D.<sup>1</sup>**

<sup>1</sup>*International Sakharov Environmental Institute of Belarusian State University,  
Minsk, Republic of Belarus;*

<sup>2</sup>*Belarusian National Technical University, Minsk, Republic of Belarus;*

<sup>3</sup>*International Charitable Public Association «EcoStroitel»,  
Minsk, Republic of Belarus*

## **MODELING OF TEMPERATURE CHANGE DYNAMICS IN ENERGY EFFICIENCY BUILDING**

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Environmental ("green") construction makes a significant contribution to the realization of sustainable development. It provides: 1) energy and resource saving, the use of waste, minimization of emissions of greenhouse gases and toxic substances; 2) harmony with the local climate, traditions, culture and environment; 3) the ability to maintain and improve the quality of life preserving the ecosystem on local and global levels.

In Belarus International Charitable Public Association «EcoBuilder» began to develop the direction of environmentally friendly individual building. According to technology of this organization individual houses were built in the village Stahovtsy, Myadel district, Minsk region and in the village Old Lepel, Lepel district, Vitebsk region. Currently, Private Production Unitary Enterprise «EcoBuilder» is active promoting this direction at Belorussian market. Wide use of local thermal insulation materials (reed, a mixture of clay-straw, clay-chips, ecowool and etc) is one of features of technologies used by the company.

Application of new insulating materials requires research of their efficiency, especially if these materials are used in multilayer structures. Perspective direction of solving this problem is a computer simulation. Often it is impossible to apply modern commercial software systems according to specifications for these purposes without their adaptation and refinement. Therefore, the aim of this work is developing of models which describe thermal characteristics of analyzed home with possibility of these models practical usage in software COMSOL Multiphysics and conducting research of efficiency of local thermal insulation envelope materials.

Preliminary numerical studies of developed thermal models showed that for calculation of whole house special high-performance computing equipments are required. Therefore, in present work temperature change calculation was carried out by supercomputer "SKIF" of UIIP NAS Belarus.