Sta-tion No. 4 (6). As a conditionally clean control sample, soil samples were taken from the State Nature Protection Institution Berezinsky Biosphere Reserve (7). All samples were fixed in 70% ethanol. They were examined according to the method of assessing pollen fertility by the acetocarmine method. The resulting preparations were studied using a light microscope at a magnification of 400x. Fertile pollen was considered to be pink-coloured, with a well-structured cytoplasm containing a nucleus with generative and vegetative cells. Sterile and teratomorphic pollen was considered to be unpainted, shrunken, empty, and with other visible damage. A micro preparation was made from the pollen of each sample and at least 2500 pollen grains were scanned [2].

The data obtained indicate the existence of a significant difference between the amount of normally devel-oped fertile pollen in the control sample and different areas of the city of Minsk, characterized by different anthro-pogenic stress. The differences between the pollen test samples and the control samples are statistically significant.

The ratio of abnormal and normally developed pollen in the studied samples significantly differs from the control sample. The number of fertile pollen in the control sample is 94,81 %, while from 44,81 % to 94,81 % in samples with anthropogenic load, which indicates that the quality of pollen directly depends on the level of contamination of the habitat of the indicator species. The largest number of defective and sterile pollen was found in sample No. 6 (44,81 %) taken in the region of TPS-4. Here, the maximum number of detected anomalies is observed – 8. This sample contains both very small and hypertrophied pollen grains, grains without content, with a destroyed and lumpy cytoplasm, with more than three pores.

Thus, since all pollen sampling sites are located close to large industrial enterprises or thermal power stations, which daily release into the atmosphere a large number of various substances including heavy metals. These substances are the main polluting factor, and the different quality of pollen grains in samples may reflect the degree of intensity of the impact of this factor.

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COMPARATIVE ANALYSIS OF THE ANATOMOMETRIC INDICATORS OF SCOTS PINE NEEDLES IN DIFFERENT TYPES OF FORESTS

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The studies conducted have shown high sensitivity of pollen grains to growth conditions. Comparative analysis of the anatomometric indicators of Scots pine needles in different types of forests.

Keywords: needles, Scots pine, types of forests, environmental factors.

Scots pine needles are the organ that is the most sensitive to environmental factors. Knowledge of the laws governing the occurrence of various variations of its anatomical structure as a result of external influences, their differentiation, the transition from a qualitative description to a quantitative expression will make it possible to nar-row the group affiliation and identify plants.

The objective of this research was to conduct a comparative analysis of the biometric indicators of pine needles, depending on the type of forest. At the end of the growing season, 20 model trees were selected from 8 sample plots in the plantations of mossy (1), sorrel (2), ledum (3) and sphagnum (4) forest, located in the territory of the Brest forestry enterprise. Samples of needles of the 1st and 2nd year of life were taken from the model trees from the first-order branches in the middle part of the crown around the entire circumference. The age of the trees ranged from 10 to 15 years. In laboratory conditions the length (A) of each needle was measured to an accuracy of 0.01 cm, the width (B) and thickness (C) were measured on transverse sections in the field of view of the Leica mi-croscope at the magnification of 10X in the middle part of the needles, the number of resin channels (D) was count-ed, and the stomata were (E) measured and counted at the magnification of 40X. Based on the experimental studies conducted, it was found that, according to the dimensional indicators of the needles (length, width, thickness, area), the pine trees are arranged in the following order: mossy, sorrel, ledum, sphagnum, i.e. in case of worse nutrition and water supply, the values of these indicators decrease ac-

cordingly. The results were obtained from 2 sample plots in each of the studied forest types. The length of stomata (F) and the area of each needle (K) was also determined (table 1).

Table 1

Indicators		Types of forests			
		1	2	3	4
A	1-year / 2-year	65,6±0,67/65,1±0,59	56,6±0,41/58,1±0,34	50,8±0,89/50,1±1,11	39,8±0,87/38,9±0,94
B	1-year / 2-year	1,63±0,006/1,68±0,01	1,60±0,01/1,62±0,01	1,54±0,01/1,59±0,01	1,54±0,01/1,49±0,01
C	1-year / 2-year	0,78±0,01/0,77±0,05	0,76±0,02/0,77±0,02	0,74±0,01/0,73±0,01	0,73±0,01/0,72±0,01
D	1-year / 2-year	33,9±0,05/33,7±0,05	33,2±0,04/32,5±0,06	33,7±0,05/32,5±0,06	35,8±0,02/34,9±0,09
E	1-year / 2-year	93,7±0,50/92,1±0,34	93,6±0,41/91,1±0,34	93,8±0,96/92,2±1,24	99,6±0,33/98,5±0,71
F	1-year / 2-year	12,1±0,09/12,2±0,08	10,8±0,09/10,5±0,21	10,5±0,08/10,5±0,20	10,1±0,02/9,9±0,11
K	1-year / 2-year	271,21/273,93	229,19/238,25	181,84/202,41	155,03/150,85

The number of resin ducts on the transverse section in the middle part of the needles for all the studied test areas varies quite significantly (20–30 %), however, there is a tendency for their greater quantity in mossy pine for-ests, and a smaller quantity in sphagnum pine forests. As for stomata, their length is directly related to the number in a row along the entire width of the needles: the fewer the stomata in a row, the larger they are. Thus, larger stoma-ta are observed in the sphagnum pine forests, i.e. in conditions of an increase in xeromorphic features (due to physiological dryness of the soil). The coefficient of variation for homogeneous types of forests ranges within 10%. But even with sufficient uniformity of the material, the degree of variability can be different. Nevertheless, taking into account the whole complex of biometric indicators, it is possible not only to conduct a study more fully and reliably but also to evaluate the data in environmental terms: determine the type of habitat (forest-growing association).

In general, it should be noted that the analysis of the obtained data confirmed the validity of the change in the biometric parameters of pine needles in various habitat conditions (forest types). The results obtained can be used in determining the conditions for pine growth.

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IMPLEMENTATION OF BIOTEST ORGANISMS OF DIFFERENT TROPHIC LEVELS IN SAFETY OF WASTEWATER BAKERY

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Safety study of wastewater samples for bakeries was undertaken. The study of the safety of wastewater fito-testirovaniem was determined by methods of morphological changes during seed germination redisaprovodili. Sewage security phytotesting was carried out based on the study of the morphological changes in the germination of radish seeds. The results determine the patterns of toxicity of the samples using different classes bioassay sys-tems confirm. Possibility of use as a bioassay-organisms in determining sewage plant safety is confirmed.

Keywords: security, bioassay, toxicity, phytotesting, ciliates, sewage.

Severity toxins contained in food raw materials and food, can be established only direct methods of evaluat-ing their impact on living organisms [1, 2]. Chemico-analytical methods can not fully evaluate the real danger of toxic substances present in food, as the simultaneous presence of several substances even at concentrations that do not exceed their MACs can manifest biological effects that can not be predicted based on the chemical composi-tion.

Safety was determined by means of wastewater bioassay test organisms of different taxonomic groups:

– Higher plants;

– Micro-organisms;

– Celled.

Wastewater phytotesting safety studies carried out on the basis of a study of morphological changes during seed germination of radish according to SanPiN 2.1.7.573-96. The aqueous extract of the samples of waste water