work with oversees tourist agencies and to continue to attract foreign guests, as foreign visitors enrich the budget of the country. Developing the agroecotourist sector is very important for any country as it can revitalize the economy of country communities and, that is crucial for the Republic of Belarus, can minimize the outflow of labour forces from the countryside and small towns.

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USE OF RAPD-PCR FOR MOLECULAR DETECTION AND POLYMORPHISM OF DANGEROUS MICROSPORE PHYTOPATHOGENS OF PINUS SP. IN VITEBSK REGION OF THE REPUBLIC OF BELARUS

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The invasion of pathogenic diseases of *Pinus sp.* caused by highly specialized species of fungi is alarming [1]. Some of the most dangerous species of fungal phytophatogens are: *Dothistroma septosporum, Lecanosticta acicola, Neocatenulostroma germanicum, Diplodia sapinea.*

Dothistroma needle blight (DNB) is a disease caused by fungi *Dothistroma septosporum*. DNB has a high level of harmfulness and is indicated in the register of phytopathogenic diseases of the Republic of Belarus as "a single occurrence". The complexity of the fight against DNB is superimposed on the ecological isolation of populations. Due to the presence of various communities, *Dothistroma septosporum* begins to exhibit molecular genetic differences over the generations, which are also reflected in their biology.

RAPD-PCR (Random Amplification of Polymorphic DNA - RAPD) is used to detect minor differences in the genomes of organisms without resorting to the whole genome sequencing.

The purpose of the research is to confirm the presence of various communities of *Dothistroma septosporum* and other microspore phytopathogens in Vitebsk region by the molecular genetic research method.

Material and methods. Fresh needles collected from different regions of Vitebsk region were used as material. The collection of material was carried out by the route method, guided by the visual presence of symptoms of phytopathogens "red band needle blight" [3]. Material collected in a period from September 2018 to May 2020. Total DNA was isolated using a method adapted to the specificity of the sample. For RAPD diagnostics, the OPA-1 primer was used. The level of DNA polymorphism was assessed as the ratio of the number of polymorphic DNA fragments to the total number of DNA markers.

Findings and their discussion. While doing the research, 22 samples were collected from different regions of Vitebsk region, guided by the visual presence of symptoms of phytopathogens "red band needle blight", followed by light microscopy of the samples for preliminary confirmation of the species causing the symptoms. For this, micro slides of the formed conidiophores were studied. The severity of the disease was assessed by the scale of damage to the crown of the tree: 5%-20% – the damage to the crown was low in severity; 20% -30% - moderate severity; 30%-55% – high severity; > 55% – very high severity [2].

After collecting and preparing the biomaterial, microbiological inoculation was carried out on an artificial nutrient medium of malt agar with the addition of *Pinus sylvestris* needles isolate to obtain non-contaminated cultures of the microspore fungus. The cultures were placed in a thermostat at 22° C, which is optimal for the development of the fungal conidia's.

In view of the presence of a dense cell wall from chitin in the fungus cultures, a technique for isolating total DNA using mixtures of organic solvents was chosen. This method made it possible to obtain a material suitable for carrying out the polymerase chain reaction. The PCR results are shown in Figure 1,2.

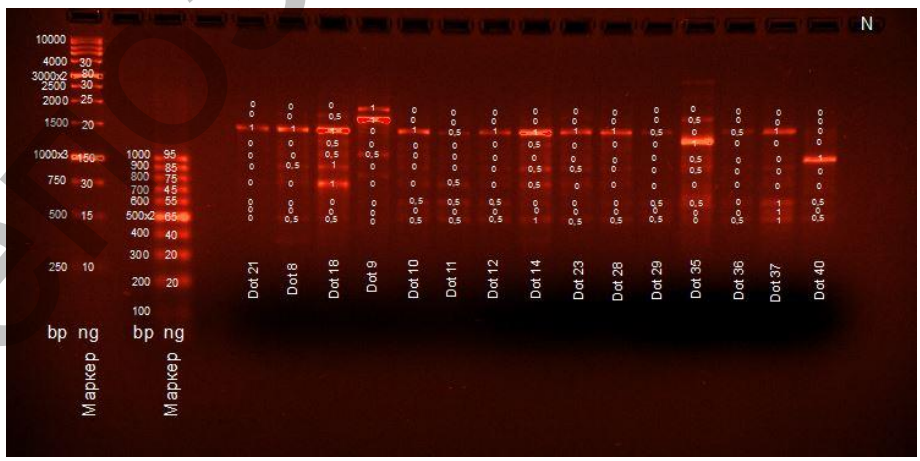

Figure 1 - Foregram amplicons of *Dothistroma septosporum* and other fungal phytopathogens

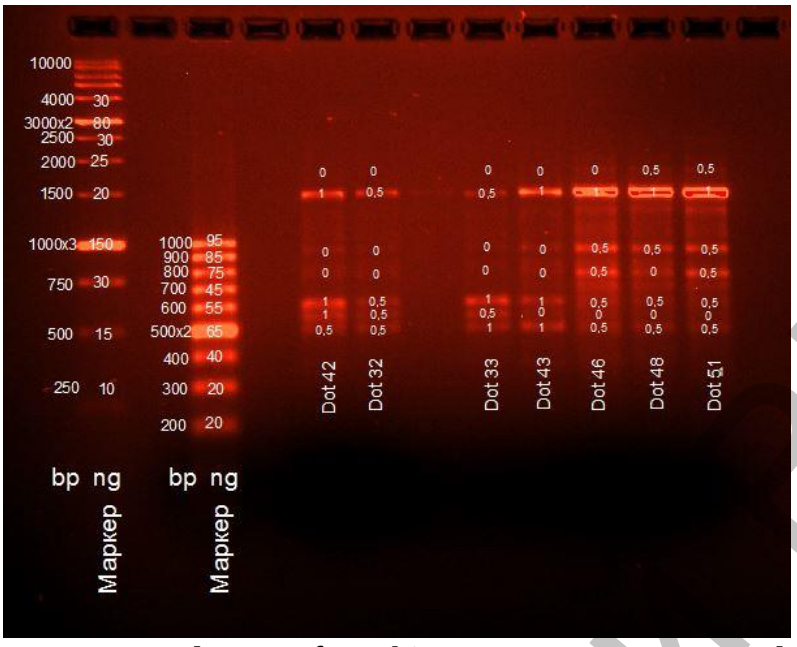

Figure 2 - Foregram amplicons of *Dothistroma septosporum* and other fungal phytopathogens

As a result of the obtained foregram, a dendrogram was built (Figure 3) using the STATISTICA 12.0 program.

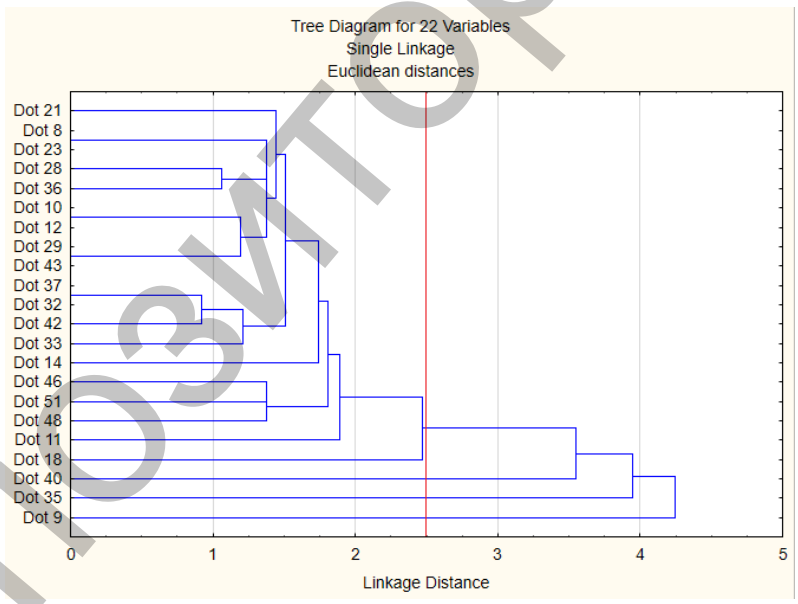

Figure 3 - Dendrogram of amplicons of *Dothistroma septosporum* and other microspore phytopathogens

The red line on the dendrogram marks the borderline between intraspecific and interspecific heterogeneity. Samples form 4 clusters: 1 – Dot 9, 2 – Dot 35, 3 – Dot 40, 4 – other samples.

Conclusion. In the course of the research, the presence of *Dothistroma septosporum* samples and the intraspecific hybridization was established. The

finding of the species *Lecanosticta acicola* (sample Dot 40) was genetically confirmed which was earlier identified morphologically. Samples Dot 9 and Dot 35 are assumed to be *Neocatenulostroma germanicum*, but DNA sequencing must be used to determine the exact species of these samples.

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THE CONTENT OF CHLOROPHYLL AND CAROTENOIDS IN LEAVES OF THE DANCELER TARAXACUM OFFICINALE

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Anthropogenic environmental pollution is a factor that plants are not evolutionarily adapted. Thus for early diagnostics penury it is advisable to use bioindication methods based on indicators that directly or indirectly characterize the course of metabolic processes in autotrophic plants. In particular, the indicators of the photosynthetic apparatus of plants are informative, since the amount of pigments in tissues determines their functional state and changes that occur during growth, development, and stress [1-4].

Wild plants are easily available cheap raw materials. One of which is dandelion officinalis.

Purpose of research – compare the state of the pigment complex (content of chlorophyll *a* and *b*, carotenoids) of the medicinal dandelion (*Taraxacum officinale*).

Material and methods. The study material was the leaves dandelion of the medicinal dandelion *T. officinale* collected in the period of flowering and fruiting on the territory of 3 different districts of Vitebsk region, the research was conducted in 3 series (№ 1 – freshly prepared extracts with an ethanol content of 70%, № 2 – measurement after 1 day, № 3 – after 7 days). The concentration of pigments in the solution is calculated using the Werner formula. The total carotenoid content is calculated using the Wettstein formula [5].

Findings and their discussion. The results of photosynthetic pigment content in dandelion leaves are shown in table №1.

As can be seen from table №1, the most content of photosynthetic pigments is observed in freshly prepared extracts (series № 1). With time, the content of photopigments decreases by 1.4; 1.6 and 1.8 in extracts of the 3 series compared with 1.