

## BEECH FORESTS OF THE "VYZHNYTSKYI NATIONAL NATURAL PARK": CURRENT SANITARY CONDITION AND PROBLEMS OF PRESERVATION

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*The beech primeval forests of the Vyzhnytskyi National Natural Park are a unique cultural heritage and play a special role for the Carpathian region and Ukraine as a whole, therefore they are strictly protected in the territories of the nature reserve fund, performing ecological, educational and scientific-cognitive functions. In this regard, monitoring the current state of the beech forests of the Vyzhnytskyi National Natural Park and highlighting the problem of their preservation becomes relevant. In the course of conducting research, classical and modern methods of forestry research were used, as well as specific methods of phytosanitary monitoring and comparative ecology. The massif of primeval beech forests of the Vyzhnytskyi National Natural Park is characterized by a remarkable diversity of fungi. We identified fruiting bodies of wood-destroying fungi on the trunks of beech trees: *Fomes fomentarius* (L. ex Fr.) Gill., *Daedalea quercina* L. ex Fr., *Phellinus igniarius* (L.: Fr.) Quel, *Laetiporus sulphureus* (Bull.: Fr.) Bond. et Sing., *Coriolus versicolor* (L.) Qué., *Stereum hirsutum* (Willd.) Pers., *Daldinia concentrica* (Bolton) Ces. & De Not., *Armillariella mellea* (Vahl) P.Karst., and *Pleurotus ostreatus* (Jacq.) P.Kumm. Groups of *Coprinus micaceus* (Fr.) and *Hypholoma capnoides* (Fr. ex Fr.) Kumm were noted near rotten beech stumps. We also came across a unique find the invasive red-listed *Clathrus archeri* (Berk.) Dring. In the course of surveys, fruiting bodies of typical representatives of the marsupial class *Xylaria polymorpha* (Pers.) Grev., and *Xylaria hypoxylon* (L.: Fr.) Grev. Representatives of xylophilic ascomycetes were identified on the dead trunk of a European beech *Bisporella citrina* (Batsch) Korf et S.E. Carp. Symptoms of dieback of central shoots and side branches, dieback of European beech bark, which is directly related to the vital activity of *Nectria ditissima* Tul., were recorded. & C.Tul.*

*Cumulative manifestations of infectious and non-infectious pathologies were noted. The problems of preserving the beech forests of the Vyzhnytskyi National Natural Park should include: intensive and uncontrolled economic activity; irresponsible behavior of tourists (arson, mechanical damage, littering, poaching, etc.); construction of highways and tourist centers in the immediate vicinity of primeval forests; damage to forest stands due to atmospheric air pollution, climate change; significant spread of pests or pathogens of forest diseases; danger of forest fires; recreational load and livestock grazing. Given the role and importance of the beech forests of the Vyzhnytskyi National Natural Park, a comprehensive study of the forest systems is necessary to preserve these unique resources.*

**Key words:** beech forests, phytosanitary monitoring, conservation, xylotrophic fungi.

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**Introduction.** Primeval forests are sustainable, self-regenerating systems primarily due to the preserved species and ecological diversity. Beech ancient forests of the Vyzhnytskyi National Natural Park are virgin areas that exist and develop under the influence of nature.

These are natural forests, which are the source of an optimal forest ecosystem since they have not been affected by human influence during their development. The average age of the trees in the surveyed primeval forests is more than 300 years, and the height reaches more than

40 meters (Tomych, 2019; Skrobala et al., 2019). They preserve valuable ecological information about the structure, history of development, capacity for self-regulation, self-regeneration, bioprotection, and geographical distribution of the forest formation (Manko et al., 2018; Smaliichuk, 2019). Beech primeval forests have extremely high vitality, and resistance to adverse effects, and participate in climate regulation, purification of water resources, carbon retention, and preservation of biodiversity (Antonucci et al., 2021; Brusak & Kravchuk, 2022).

Due to the intensive and uncontrolled human economic activity, such primeval forests are being destroyed almost all over the world, and it is currently impossible to recreate them (Schulze et al., 2016; Scolastri et al., 2020). Ancient forests were mostly able to be preserved in hard-to-reach areas and places far from populated areas, where their felling is generally physically impossible or unprofitable. Wood harvesting is carried out there in small volumes, exclusively for the needs of the population, which cannot be stopped (Vandekerkhove et al., 2018). Unfortunately, the local population is not always aware of the difference between commercial forests and valuable virgin forests (Plikhtiak, & Khomiuk, 2022). Irresponsible behavior of tourists is also often observed (setting fires, causing mechanical damage, littering, poaching, etc.) (Biliak, 2015; Smaliichuk, 2017).

Given several centuries of management and anthropogenic change in European forests, the remnants of primeval forests provide the only opportunity to study the natural structure, diversity, and genetic structure of unchanged forests, as well as the species diversity of fungi that are destructors of dead wood in beech primeval forests (Glatthorn et al., 2017; Prots, et al., 2019). Thus, taking into account the role and importance of beech primeval forests of the Vyzhnytskyi National Natural Park, a comprehensive study of primeval forest systems is necessary to preserve these unique riches.

**Materials and methods.** The sanitary condition of beech forests on the territory of the Vyzhnytskyi National Natural Park was assessed mainly in the summer months (July-August) of 2022-2023 on 10 trial plots using their detailed survey, assessing the category of European beech trees, the loss of the assimilation apparatus, typical symptoms of diseases of infectious etiology.

The main purpose of a reconnaissance survey is to directly identify foci of mass lesions by pathogens and visually assess the degree of damage to needles and the percentage of weakened and affected trees. The survey was carried out along walking lines, which are convenient to plan parallel to quarterly roads, retreating from them by several tens of meters (the height of the tree stand). We carried out a detailed examination only in those areas where outbreaks of pathogens were found.

The general condition of forest stands was assessed by the sanitary condition of trees on the plots by inspecting them according to the "Sanitary Rules" (trees of category I – without signs of weakening; II – weakened; III – very weakened; IV – dieback; V – fresh dieback; VI – old dieback) (Sanitarni pravyla v lisakh Ukrainy, 1995; Probni ploshchi lisovporiadni, 2006).

The condition of the trunks of woody plants is assessed by the presence and distribution of necrosis, ulcers, hollows, cracks. During detailed studies in disease foci, a non-specific scale is used (Table 1), during examinations – simplified scales for evaluating individual symptoms (Mieshkova et al., 2020).

A simplified scale for evaluating the distribution of fruiting bodies of wood-destroying fungi along the trunks and branches of woody plant species: 0 points – absent; 1 point – single; 2 points – massive (Lavrov et al., 2018).

To assess the spread of ulcers of bacterial origin (bacterial wetwood, tuberculosis-type lesions) it is also advisable to use a simplified scale: 0 points – no ulcers (tuberculous tumors); 1 point – single; 2 points – massive; 3 points – fully covered by tumors (Mieshkova et al., 2020).

The scale of losses of the assimilation apparatus of forest trees was used to assess the degree of defoliation (Borecki & Keczynski, 1992). According to the defoliation of trees, the average value of the characteristic for the tree species and the stand was determined and the forest stand was classified according to one of four degrees of damage: no damage (0) – defoliation  $\leq 10\%$ ; slightly damaged (1) – 11–25%; moderately damaged (2) – 26–60%; very damaged (3) – 61–90%; the dieback (4) – 91–100%.

Samples or photos of damage, and the presence of fruiting bodies were used for identification using special literary sources (The world of mushrooms of Ukraine; Sukhomlyn & Dzhazhan, 2013). Identification of fungi was carried out in stationary conditions according to the the «Mushrooms of Ukraine: atlas-handbook» (Sukhomlyn & Dzhazhan, 2013). Systematic taxa were taken according to D. K. Zerova (Zerova et al., 1979), and ecological groups of fungi were distinguished according to I. A. Dudka (Dudka et al., 2019).

**Results.** On the territory of the Vyzhnytskyi National Natural Park, primeval forests with a total area of 367.9 hectares grow, of which 86.5 hectares are beech. Covering elevated areas of the terrain, pure beech and mixed forests with white fir (*Abies alba*), common spruce (*Picea abies*), and other species play a soil-protective, water-conserving, and water-regulating role (Tomych, 2019). They contribute to transferring surface runoff into internal groundwater, ensuring a uniform flow of precipitation into rivers, and protecting natural and artificial reservoirs from siltation. Over the past ten years, the area of beech forests in the Carpathians has significantly decreased, resulting in floods. The main forestry and taxation indicators of the beech primeval forests of the Vyzhnytskyi National Natural Park are presented in the table 2.

In the course of monitoring the current condition of beech forests on the territory of Vyzhnytskyi National Natural Park, a general weakening of the sanitary condition of European beech trees was registered. In particular, according to the degree of degradation of the photosynthetic apparatus, it was established that the examined beeches, on average, belong to the "slightly damaged" class. At the same time, natural forests and growing beech stands are characterized by greater damage and belong to the "medium damage" class.

Regarding the share of European beech trees with damage, the situation on experimental plots (EP) is different:

Table 1

**A non-specific scale for assessing the condition of trunks of woody plants**

Score	Characteristics of lesions or damage
1	no signs of disease or damage
2	the damage is weak (a small number of cracks overgrown with callus), necrosis of the zone near the roots up to 25% of the perimeter
3	damage is moderate; wounds and cracks up to 5 cm long are not overgrown with callus, necrosis of the zone near the roots of 26–50% of the perimeter, traces of damage by lightning, frost cracks
4	severe damage; wounds and cracks longer than 5 cm not overgrown with callus, traces of lightning and frostbite cracks, symptoms of rot, necrosis of the zone near the roots of 51–75% of the perimeter, fruiting bodies of wood-destroying fungi
5	very strong damage; large wounds, signs of rot, hollows, numerous fruiting bodies of wood-destroying fungi, necrosis of the root zone over 75% of the perimeter, areas of peeled bark

Table 2

**The main (averaged) inventory indicators of the European beech trees that form the beech primeval forests of the Vyzhnytskyi National Natural Park**

Tier	Height, m	Diameter, sm	Number of trees, pcs/ha	The sum of cross-sectional areas, m <sup>2</sup> /ha	Timber stock, m <sup>3</sup> /ha
I tier	35,6±2,1	56,8±2,4	43±0,8	10,79±0,2	163,0±1,5
II tier	26,8±1,2	24,8±1,3	67±1,5	3,49±0,6	41,3±2,2
III tier	12,2±1,0	11,0±0,5	133±1,1	1,27±0,5	7,8±0,7
Stand	26,0±1,1	28,2±1,4	243±2,6	15,55±0,4	212,1±1,4

from 2 pcs. on EP No. 2 up to 32 pcs. on EP No. 5. In terms of intensity, damage of more than 25% is observed only on EP No. 1 and EP No. 5. According to the types of damage, frost cracks and wood-destroying fungi, which are the causes of trunk rot, are quantitatively predominant in the trial areas (Table 3). This state of primeval forests corresponds to one of the phases of its development – aging.

Thus, the following types of phytopathogens were identified in the process of surveying the current sanitary condition of beech primeval forests of the Vyzhnytskyi National Natural Park. In particular, necrotic and cancerous diseases, which are represented by *Nectria* spp. (causing fungi *Nectria ditissima* Tul. & C.Tul.), are visible against the light bark of European beech trunks. Symptoms of cancer-causing *Nectria*, in the form of a mass number of cancerous growths, were observed on the trunk and branches of beech trees, their number reached dozens or even hundreds of tumors on one tree. There is drying of the central shoots and side branches,

dieback of the bark. Fungi of various ecological groups play a very important functional role in primeval forests, where invertebrates and bacteria, take an active part in the processes of mineralization of organic substances and destruction, the reserves of which are accumulated every year due to the activity of photosynthesizing higher and lower plants.

Mainly, in the course of conducting detailed surveys, identified various ecological groups of wood-destroying fungi, in particular, facultative parasites that inhabit both living and rotten wood and saprotrophs that grow on dead trunks, stumps, and branches (Table 4).

The presence of fruiting bodies of the real (*Fomes fomentarius* (L. ex Fr.) Gill.) is visible, which is one of the most dangerous destroyers of beech wood (Fig. 1 on the right). It is widespread on all continents. Under the action of this wood-destroying parasitic fungus, the affected wood first turns brown, later it acquires a yellow-white color, becomes soft, and dark brown and black lines form on it.

Table 3

**Indicators of the state of beech primeval forests of the Vyzhnytskyi National Natural Park**

№ trial area	Damage, pcs.								
	Windfall, windbreak	Tree hollow	Mechanical damage	Frost cracks	Cancer	Trunk rot	Wood defect	Basidiocarps of polypores	Tumors
1	5	3	3	-	-	-	5	-	-
2	1	-	-	-	-	4	1	4	-
3	6	2	-	3	4	-	-	8	-
4	2	7	2	1	-	6	-	6	4
5	2	4	5	1	3	-	-	-	-
6	1	-	1	4	10	3	-	3	2
7	2	4	-	8	-	12	-	15	1
8	-	1	-	-	-	10	1	11	-

Summary list of pest foci, forest diseases, and natural phenomena for 2023 according to the Vyzhnytskyi National Natural Park

The name of the pathology	Specific name	Area of the disease focus
Pests of forest	<i>Ips typographus</i> L., <i>Pityogenes chalcographus</i> L.	19,8
Diseases of the forest (total)		103,0
Wood-destroying fungi	<i>Fomes fomentarius</i> (L. ex Fr.) Gill., <i>Daedalea quercina</i> L. ex Fr., <i>Phellinus igniarius</i> (L.: Fr.) Quel., 1886, <i>Laetiporus sulphureus</i> (Bull.: Fr.) Bond. et Sing., <i>Coriolus versicolor</i> (L.) Quel., 1886, <i>Stereum hirsutum</i> (Willd.) Pers., 1800, <i>Daldinia concentrica</i> (Bolton) Ces. & De Not., 1863, <i>Armillaria mellea</i> (Vahl) P.Kumm., (1871), <i>Pleurotus ostreatus</i> (Jacq.) P. Kumm., 1871, <i>Phellinus hartigii</i> (Allesch. & Schnabl) Pat., 1903, <i>Laetiporus sulphureus</i> (Bull.) Murrill, (1920), <i>Polyporus squamosus</i> (Huds.) Fr., 1821, <i>Fistulina hepatica</i> (Schaeff.) With., 1792, <i>Heterobasidion annosum</i> (Fr.) Bref., 1889, <i>Fomitopsis pinicola</i> (Sw.) P.Karst., 1881	50,5
Pathogens of diseases	<i>Nectria ditissima</i> Tul. & C.Tul., <i>Melampsorella cerastii</i> Wint.	34,0
Semi-parasitic plants	<i>Viscum album</i> L.	18,5
Adverse weather conditions	Windfall, windbreak	16,3

Fruiting bodies of the *Daedalea quercina* L. ex Fr., which causes a destructive type of rot, were also identified on the beech trunks by their dark brown color with a typical grayish tint (Fig. 1 on the left). At the final stage, cracks appear and rot separates into plates. Yellowish or grayish-white films of mycelium spread in the cracks.

The fruiting bodies of *Phellinus igniarius*, *Laetiporus sulphureus*, *Coriolus versicolor*, *Stereum hirsutum*, *Daldinia concentrica*, *Armillariella mellea*, and *Pleurotus ostreatus* have also been identified.

As is known from literary sources, a typical indicator of the conditions of ancient forests is the so-called "old forest mushroom" *Hericium coralloides*. Unfortunately, it was not possible to find its fruiting bodies in the temporary test plots.

However, a unique find did happen – an invasive saprotrophic fungus *Clathrus archeri* (Berk.) Dring (Fig. 2 on the left). Its name is also associated with an octopus, a cuttlefish, or a flower. The folk name "devil's fingers". Inedible. The mushroom is listed in the Red Book of Ukraine. It is worth noting that on the territory of the national park, this find is not isolated and the expansion of this mushroom continues.

Also, marsupial fungi are an integral part of the heterotrophic block of the ecological system of beech forests. In particular, we found fruiting bodies of typical representatives of this class – *Xylaria polymorpha* (Pers.) Grev., and *Xylaria hypoxylon* (L.: Fr.) Grev.

*Coprinus micaceus* (Fr.), and *Hypholoma capnoides* (Fr. ex Fr.) Kumm., which are xylophages (wood-destroying



Fig. 1. A group of fruiting bodies of the *Fomes fomentarius* on the trunk of an old European beech tree (right) and the hymenophore of the *Daedalea quercina* (left)



Fig. 2. Edible fungi of the genus *Ramaria* (right) and *Clathrus archeri* (left)

fungi), grow in massive clusters near rotten beech stumps. Xylotroph fungi process dead organic matter in the forest with the help of enzymes adapted to the destruction of lignin and cellulose in the cell walls of wood.

Among xylophilic ascomycetes, a subgroup of lignophilous fungi, which carry out the primary stage of destruction of dead wood, occupies a special place in old natural forests. Discomycete fungi occupy a significant share of this group. We identified typical representatives of this subgroup – *Bisporrella citrina* (Batsch) Korf et S.E. Carp.) on the dead trunk of a European beech (Fig. 3 on the right).

We also registered fungal organisms of the Myxomycetes class in the beech forests of the Vyzhnytskyi National Natural Park.

In the process of surveying the current sanitary condition of the beech forests of the Vyzhnytskyi National Natural Park, we noted cumulative manifestations of infectious and non-infectious pathologies, in particular, single canker sores and frostbite cracks were simultaneously registered on one tree. Harmful effects of windfalls, as well as mechanical damage of various origins were noted by us on the trunks of ancient European beech trees within the surveyed areas on the territory of Vyzhnytskyi National Natural Park, they significantly worsen the overall sanitary condition of stands. The danger of a windfall depends on the nature of the wind, the season of the year, the tree species, the age of the trees, their condition, the condition and nature of the soil, etc.



Fig. 3. Fruit bodies of *Bisporrella citrina* (Batsch) (in the right) and *Lycogala epidendrum* (L.) Fr. (in the left)

In modern economic conditions, there are many possible threats to the beech forests of the Carpathians, in particular those located on the territory of the Vyzhnytskyi National Natural Park – the construction of highways and tourist centers near the forests, damage to forest stands due to atmospheric air pollution, climate change, significant spread of pests or pathogens forest diseases (especially currently a real threat of mass spread of trunk pests), the danger of forest fires increases every year, the recreational load and sheep grazing increase, which can cause the digression of primeval forest ecosystems and, as a result, lead to a decrease in the number of species diversity of flora and fauna. That is why the legal legislation in the field of protection of primeval forests and the regulation of such actions for the benefit of ecological balance in Ukraine is particularly important.

**Discussion.** Old natural forests are natural forest ecosystems formed spontaneously in the process of phytocenogenesis, in which different age groups (from juvenile to senile) of the development phase (from the renewal phase to the decomposition phase) are represented, in which the natural connections between autotrophic and heterotrophic blocks, and therefore they function as mobile balanced ecosystems with their inherent homeostasis (Mykhailyk, 2015; Schall et al., 2018).

The sanitary state of forests is manifested in obvious factors – it can be a windstorm, or a snowstorm, or the tree may have died as a result of the vital activity of phytopathogenic fungi and fungus-like organisms (Stoyko, 2018). The fungi settle on the tree and gradually create

a colony that the tree feeds on. So the tree itself gradually weakens, eventually rots and dehydrates, and then either dries up or breaks, weakened, under the pressure of snow or wind (Cherniavskiy & Hrebeniak, 2015).

The wood of weakened trees, as well as those that are dieback, is a source of high energy and a specific habitat for many species of invertebrates, including insects. In forest biocenoses, xylophagous insects are numerous, while the role of each species is unique and corresponds to its ecological niche (Shparyk et al., 2018; Myklush et al., 2021).

Evaluating the degree of transformation of primeval beech forests according to the scale of assessing the consequences of the transformation of forest phytocenoses (Buksha et al., 2017), is established that the degree of changes in the tree stand from the "insignificant" category went to "significant", in particular, due to the impact of anthropogenic transformations on ecological stability and biological diversity (Blystiv & Maurer, 2019). The ecological consequences of anthropogenic influence are reflected by changes in the species composition of stands (Hobi et al., 2015; Krynytskyi et al., 2022). We note that the stratification is clearly expressed in the examined primeval forest. Accordingly, more than 70.0% of the stock is concentrated in the first tier of the stand, which, according to the IUFRO methodology, includes all trees with a height of more than 2/3 of the maximum height in the stand. In the second (1/3 – 2/3 of the maximum height) and third (less than 1/3 of the maximum height) tiers, 20.0% and 10.0% of the stock are concentrated, respectively. Among the spe-

cies, beech (*Fagus sylvatica* L.) dominates 76.4% of the total stock, while the share of hornbeam (*Carpinus betulus* L.), maple (*Acer pseudoplatanus* L.) and elm (*Ulmus glabra* Huds.) is respectively 12.3%, 10.6%, and 0.7%. Beech dominates the upper and lower tiers. Hornbeam, on the other hand, prevails in the second tier. Elm is found exclusively in the third tier (Luick et al., 2021).

Thus, one of the most significant problems today is the expansion of the territories of the Vyzhnytskyi National Natural Park at the expense of primeval forests and especially valuable forests and proving to the communities that these actions do not involve the destruction of the forestry industry of the Carpathian region. We are talking about the creation of a region where the nature-tourist and economic components will be harmoniously and ecologically justified.

**Conclusions.** The monitoring of the current condition of the beech forests of the Vyzhnytskyi National Natural Park was evaluated according to accounting and literary sources and field methods. In the course of monitoring the current condition of the beech forests on the territory of the Vyzhnytskyi National Natural Park, we registered a general weakening of the sanitary condition of the European beech trees.

In the beech forests of the Vyzhnytskyi National Natural Park, cumulative manifestations of infectious and non-infectious pathologies were noted. In terms of types of damage, frost cracks and wood-destroying fungi, which are the causes of trunk rot, predominate quantitatively in the temporary test plots. Such a state of primeval beech forests fully corresponds to one of the phases of its development – aging.

The massif of primeval beech forests of the Vyzhnytskyi National Natural Park is characterized by a remarkable

diversity of macro- and micromycetes. We discovered and identified fungi of various ecological groups, in particular, edible fungi, red book species, phytopathogenic fungi – pathogens of diseases of forest woody plants, xylotrophic fungi, xylophilous species, representatives of fungi-like organisms found on living and dead beech wood, as well as directly under the canopy old beech forests. Among the species of this ecological group, saprotrophs dominate, followed by facultative parasites.

An important factor influencing the current state of the beech forests of the Vyzhnytskyi National Natural Park is the general ecological situation in the Ukrainian Carpathian region, which is one of the consequences of human production and climate change. In addition, the beech forests of the Carpathian region are constantly threatened by factors of anthropogenic origin (belonging to the zone of exploitation forests, the development of the network of forest roads, forest fires, etc.). Currently, these problems require an immediate solution and the intervention of state authorities, in order to preserve the state of beech forests, which at least is now.

Such problems can be circumvented by establishing scientifically based restrictions on the duration, number of visits to certain routes and the number of tourist groups; develop scientifically based plans for the development of hiking and bicycle-tourist routes in separate areas of beech forests at different times of the year; stricter regulation of recreation, carrying out explanatory work among visitors regarding the responsible attitude to rare species of flora (different categories); control over unregulated felling of primeval forests. That is why the legal protection of primeval forests and regulation of such actions for the benefit of primeval forests of Ukraine is significant.

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**Букові праліси НПП «Вижницький»: сучасний санітарний стан та проблеми збереження**

Букові праліси НПП «Вижницький» є унікальною культурною спадщиною і відіграють особливу роль для Карпатського регіону і України цілком, тому суворо охороняються на територіях природно-заповідного фонду, виконуючи еколого-освітні та науково-пізнавальні функції. У зв'язку із цим набуває актуальності проведення моніторингу сучасного стану букових пралісів НПП «Вижницький» та виокремлення проблеми їхнього збереження. В ході проведення досліджень використовувались класичні і сучасні методи лісівничих досліджень, а також специфічні методи фітосанітарного моніторингу і порівняльної екології. Масив букових пралісів НПП «Вижницький» відзначається неабияким різноманіттям грибів. На стовбурах буків нами ідентифіковані плодові тіла дереворуйнівних грибів: *Fomes fomentarius* (L. ex Fr.) Gill., *Daedalea quercina* L. ex Fr., *Phellinus igniarius* (L.: Fr.) Quel., *Laetiporus sulphureus* (Bull.: Fr.) Bond. et Sing., *Coriolus versicolor* (L.) Qué., *Stereum hirsutum* (Willd.) Pers., *Daldinia concentrica* (Bolton) Ces. & De Not., *Armillariella mellea* (Vahl) P.Karst. та *Pleurotus ostreatus* (Jacq.) P.Kumm. Біля ґнелих пнів бука відмічені групи *Coprinus micaseus* (Fr.) та *Hypholoma carponoides* (Fr. ex Fr.) Kunt. Також нам трапилася унікальна знахідка – інвазійний червонокнижний *Clathrus archeri* (Berk.) Dring. В ході обстежень зареєстровані плодові тіла типових представників класу сумчасті гриби – *Xylaria polymorpha* (Pers.) Grev. та *Xylaria huroxylon* (L.: Fr.) Grev. На відмерлому стовбурі бука європейського були ідентифіковані представники ксилофілних аскоміцетів – *Bisporella citrina* (Batsch) Korf et S.E. Carp. Зафіксовані симптоми усихання центральних пагонів і бокових гілок, відмирання кори бука європейського, що безпосередньо пов'язане із життєдіяльністю *Nectria ditissima* Tul. & S.Tul. Відмічені сукупні прояви патологій інфекційного і неінфекційного характеру. До проблем збереження букових пралісів НПП «Вижницький» слід віднести: інтенсивну й безконтрольну господарська діяльність; безвідповідальну поведінку туристів (вчинення підпалів, нанесення механічних пошкоджень, засмічення, браконьєрство тощо); будівництво автомобільних доріг і туристичних центрів у безпосередній близькості до пралісів; пошкодження лісових деревостанів внаслідок забруднення атмосферного повітря, кліматичні зміни; значне розповсюдження шкідників або збудників хвороб лісу; небезпека лісових пожег; рекреаційне навантаження та випас худоби. Враховуючи роль та значення букових пралісів НПП «Вижницький» необхідне всебічне дослідження пралісових систем метою збереження цих унікальних багатств.

**Ключові слова:** букові праліси, фітосанітарний моніторинг, збереження, гриби-ксилотрофи.