

## Analysis of the state of dendroflora of park zones in Poltava concerning its lesion by mistletoe (*Viscum album L.*)

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Mistletoe (*Viscum album L.*) white is the only plant on the Earth that has a unique substance that paralyzes cancer cells and simultaneously stimulates human immunity. However, despite its curative properties, mistletoe white has so far caused considerable damage to tree plantations in human settlements, acting not only as a parasitic plant, but also as a spreader of various diseases of woody plants. Mistletoe, being an inseparable component of tree plantations, both natural and urbanized ecosystems, settling on trees. Then it begins to destroy them intensively. This is why the question of protection of trees from mistletoe white is relevant at present. The purpose of the article is research the state of tree species in park zones of Poltava concerning their damage by white mistletoe (*Viscum album L.*). The article presents the results of the analysis of the state of the main tree species of the park zones of Poltava city of concerning their lesion by white mistletoe during 2017–2022. According to the results of the study identified tree species, which due to their species biologically-physiological features are affected more and vice versa show greater resistance to damage by mistletoe white (*Viscum album L.*). Recommendations for improving the species composition of tree species in park areas of Poltava, taking into account their resistance to mistletoe white damage, have been formulated. For the first time, we studied the degree of damage to deciduous trees in the park areas of Poltava, and set the degree of damage to trees affected by white mistletoe depending on their species biology and physiology, particularly, the structure and thickness of the bark. The influence of species-specific biologic and physiological features of tree species in the park areas of Poltava on the degree of their lesion by mistletoe white has been established. The most resistant woods have been determined, which can be recommended for renewal of the species composition of the dendroflora of the park zones of the urban ecosystem.

**Keywords:** dendroflora, mistletoe white, semi-parasite, gaustoria, bark, recreational area, urban ecosystem.

## Аналіз стану дендрофлори паркових зон м. Полтави що до їх ураження омелою білою (*Viscum album L.*)

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Омела біла (*Viscum album L.*) єдина рослина на землі, що володіє унікальною субстанцією, яка паралізує ракові клітини і одночасно стимулює імунітет людини. Та все ж, незважаючи на свої цілющі властивості омела біла на сьогодні завдає значної шкоди деревним насадженням населених пунктів, виступаючи не тільки в якості рослини паразита а й як поширювач різних захворювань деревних рослин Омела будучи невід'ємним компонентом деревних насаджень, як природних так і урбанізованих екосистеми, поселяючись на деревах, почала інтенсивно знищувати їх, тому питання захисту дерев від омели білої є актуальним у наш час. Мета статті було вивчення стану деревних порід паркових зон міста Полтави що до ураження їх омелою білою (*Viscum album L.*). Наведено результати аналізу стану основних деревних порід паркових зон міста Полтави щодо ураження їх омелою білою протягом 2017–2022 років. За результатами дослідження визначено породи дерев, які в силу своїх видових біолого-фізіологічних особливостей найбільш вражаються і навпаки виявляють більшу стійкість до пошкоджень омелою білою (*Viscum album L.*). Розроблені рекомендації щодо оздоровлення видового складу деревних порід паркових територій міста Полтави з урахуванням їх стійкості до враження омелою білою. У роботі проведено дослідження щодо ступеня пошкодження деревних листяних порід в паркових зонах міста Полтава, встановлена залежність ступеня враження омелою білою дерев від їх видових фізіолого біологічних особливостей, зокрема від структури та товщини кори. Практична значущість проведеної роботи полягає у встановленні впливу видових біолого-фізіологічних особливостей деревних порід паркових територій міста Полтави на ступінь їх ураження омелою білою. Визначено найбільш стійкі деревні породи, які можна рекомендувати для оновлення видового складу дендрофлори паркових зон урбоекосистеми. Отримані результати проведеного дослідження можна використовувати для проведення оздоровчих заходів щодо оновлення деревних насаджень рекреаційних територій та дадуть можливість розробити практичні рекомендації, спрямовані на поліпшення ситуації з омелою білою (*Viscum album L.*) не тільки у паркових зонах м. Полтава а й оптимізувати зелені насадження будь якого населеного пункту.

**Ключові слова:** ґрунти, чорноземи звичайні, родючість, гумус, агроекологічний потенціал.

**Бібліографічний опис для цитування:** Писаренко В. М., Піщаленко М. А., Бараболя О. В., Красота О. Г., Мулер М. О. Аналіз стану дендрофлори паркових зон м. Полтави що до їх ураження омелою білою (*Viscum album L.*). *Scientific Progress & Innovations*. 2023. № 26 (2). С. 65–71.

## Introduction

Mistletoe is a rather peculiar plant, a semi-parasite. The sharp sprouts of mistletoe (*Viscum album* L.) cannot penetrate the wood, so fresh layers of bark grow around the sprouts annually on the outside, gradually submerging the bush in itself. Mistletoe, by synthesizing sugars and other nutrients, not only gives nothing back to the host plant, but it also cuts off the access of nutrients to the branches that are placed higher up on the tree. This inevitably leads to gradual desiccation and then death, first of the branches and then of the whole tree. If a few decades ago this plant was very rare in Ukraine, white mistletoe (*Viscum album* L.) has become an indispensable component of tree plantings in urban landscapes of our settlements both in winter and summer now. It should be noted that mistletoe (*Viscum album* L.) has now become a real threat to our park and garden areas. In recent years, the degree of damage by mistletoe (*Viscum album* L.) to green areas of urban ecosystems takes on the scale of an ecological disaster. An effective fight against mistletoe is therefore not a matter of spontaneous action, but rather of organized and sustained effort. Many European countries have specific national programmes to combat mistletoe. In Ukraine, mistletoe control programs are applied only in large cities, but according to existing data, since 2005, their funding has been significantly reduced or ceased altogether, which has had a negative impact on the green areas of settlements [1–6].

Mistletoe white (*Viscum album* L.), locally known as Mistletoe curse, is an evergreen shrub in the mistletoe (*Loranthaceae*) family. It is a semi-parasitic plant, settling on the above-ground parts of deciduous, rarely coniferous trees. Its life cycle is 4–6 years. Mistletoe flowers in spring and bears fruit in winter. It reproduces by seeds, which are usually spread by birds [7–11]. In the absence of light, the seeds not only fail to germinate, but also lose their ability to develop further. The leaf apparatus of mistletoe (*Viscum album* L.) photosynthesises almost all year round. Photosynthesis produces organic substances, resins, choline, tannins and saponin-like substances, fatty acids and alkaloids [12, 13]. It has been established that the osmotic pressure of vegetative organs of mistletoe white reaches 31–35 atm [13]. These well-established physiological and biological processes explain the complete frost-resistance, as well as the absence of damage by pests and lesions by pathogens.

Mistletoe (*Viscum album* L.), being an inseparable component of tree plantations, both natural and urbanized ecosystems, settling on trees. Then it begins to destroy them intensively. This is why the question of protection of trees from mistletoe white is relevant at present. But to date, the peculiarities of resistance of tree species used in recreational areas of urban ecosystems to mistletoe (*Viscum album* L.) have not been studied sufficiently. To present day in the scientific literature, in most cases, mistletoe white is considered from the standpoint of the possibility of its use in medicine [23]. In particular, in homeopathy, the

essence of fresh fruits and leaves is used, but it is most productively used in the treatment of cancer [6, 14–20]. Mistletoe white is the only plant on the Earth that has a unique substance that paralyzes cancer cells and simultaneously stimulates human immunity. However, despite its curative properties, mistletoe white has so far caused considerable damage to tree plantations in human settlements, acting not only as a parasitic plant, but also as a spreader of various diseases of woody plants [21, 22]. Control of mistletoe white (*Viscum album* L.) is necessary only in urbanized areas, while in nature it is an integral component of ecosystems, which plays a role in maintaining their stability. A catastrophic situation with mistletoe infestation of deciduous tree species has developed in the recreational areas of Poltava today. This fact poses a threat to the life of the city's population. Trees affected by mistletoe become brittle and break easily, even from minor gusts of wind. It is especially dangerous in pedestrian areas, parks, squares, courtyards of houses and educational institutions, as well as along motorways.

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## The aim of the study

The aim of the work was to find out the degree of damage of dendroflora of recreational areas of different districts of Poltava by mistletoe white (*Viscum album* L.). In order to achieve these goals, we solved the following tasks:

- To evaluate the degree of damage by mistletoe (*Viscum album* L.) of the main tree species of park zones of the city in connection with their species-specific physiological and biological features;
- To work out and offer practical recommendations for improving the situation with mistletoe (*Viscum album* L.) in the neighborhoods of Poltava.

## Materials and methods

During the research we used materials of route and experimental research conducted in the territory of Poltava city according to existing methods during 2017–2022.

For the research we chose 3 model areas of Poltava city, which are microdistricts of the regional centre – Kyivskiy, Podilskiy and Shevchenkivskiy. In Shevchenkivskiy district the following microdistricts were investigated: Almaznyi, Tsentralny and Sady-1. In Podilskiy district: Podil, Levada and Pivdennyi Terminal districts; in Kyivskiy district: Brailky, Polovky and Yurivka districts. At the selected sites we calculated the number of affected trees compared with the total number of tree species of the studied species, namely Norway maple (*Acer platanoides*), European birch (*Betula pendula* Rolt), Small-leaved linden (*Tilia cordata*), English tree (*Robiniaps*). The choice of these

deciduous species is primarily due to the specific structure of their bark. The degree of tree species' damage by mistletoe white was determined according to a 5-point scale proposed by S. I. Kuznetsov, F. M. Levon, Y. A. Klymenko, M. I. Shumyk, and V. F. Pylypchuk [23].

## Results and discussion

According to the results of research and literature data, the dendroflora of Poltava region parks includes 470 species, 120 forms, 28 hybrids, 8 varieties, and 1 species belonging to 143 genera, 60 families and two divisions. The section of the covered plants (Magnoliophyta) is represented by 523 taxa from 128 genera and 55 families; the section of the gymnosperms (Pinophyta) is represented by 104:15:5 [21] accordingly. The highest indicator of species and intraspecific diversity among cultivated dendroflora of parks of Poltava region is represented by the family Rose (132 species, forms, hybrids). In the dendroflora of parks of Poltava region there are 518 species of deciduous plants, 108 evergreens and one semi-evergreen species. As a result of geographical analysis, 50 indigenous tree and shrub species, which are natural components of forest, wood and shrub vegetation of Poltavska province, were identified in the dendroflora of parks. The group of plants (19 species) was the most numerous among the tree species of the native fraction that form the non-moral vegetation type. Five plant species are the main forest forming woody species of broad-leaved forests of Left Bank Forest-Steppe (European oak, Norway maple and English field maple, winter linden tree, European ash). They form the basis of trees of most parks of Poltava region, thereby bringing them closer to forest type landscapes, with a corresponding herbaceous cover of immoral plant species [12, 13]. Trees and shrubs of floodplain poplar and willow forests are widely used in park plantations, in particular, white poplar, shaky poplar, white willow, French willow. Resistance of plants to air pollution by smoke, dust and gases plays an important role for green building, as the majority of parks in Poltava are located in or close to industrial cities. This property of tree species is taken into account in landscaping of industrial centers, districts, school territories when creating street plantings. We carried out a visual survey of biotopes of Poltava city for the infestation of deciduous tree species by mistletoe white, and we noted that the spread of this semi-parasitic species is becoming catastrophic.

We mainly found Mistletoe white in mature and overmature trees in park areas and along local roads. This is a worrying signal, as the mistletoe damage causes the trees to decay, which is particularly dangerous in high winds and snowstorms. The spread of mistletoe white in the biotopes of

Poltava causes significant damage to their dendroflora, leading to a decrease in their aesthetics, phytomeliorative function, causing rapid aging and dying off. To date, mistletoe white affects a significant part of street, intra-block and park plantings (Fig. 1).



**Fig. 1.** Territory of Cadet Corps (Shevchenkivskyi Microdistrict, Poltava)

To assess the extent of mistletoe white wood affection in park plantations of microdistricts of Poltava we selected the most common wood species in the territory of the settlement, namely English tree (*Robinia pseudoacacia*), Norway maple (*Acer platanoides*), Small-leaved linden (*Tilia cordata*), European birch (*Betula pendula*). According to the literature, the anatomical features of a tree, in particular the structure of the bark, affect the degree of its damage by mistletoe. The bark structure of the tree contributes to the rapid spreading and germination of mistletoe culms on the tree [13, 23]. It is the loose bark structure of trees such as the Norway maple, European birch, English tree, and Small-leaved linden that served as the subject of our study.

We established 3 monitoring sites in different districts of Poltava: Shevchenkivskyi, Kyivskyi and Podilskyi. In Shevchenkivskyi district, the Almaznyi Microdistrict was investigated (a park area between Almaznyi and Sady 2). It was park area of Pivdennyi terminal in Podilskyi district. We examined trees along the road of Balakin street in Kyivskyi district. We calculated the total number of tree species compared to trees of selected species affected by mistletoe white in these areas (Table 1).

Thus, we found that 184 of 346 examined trees in Poltava, representing 53.2 %, were affected. Out of them English tree (*Robinia pseudoacacia*) – 67 trees, making 36 % of total number of trees, Norway maple (*Acer platanoides*) – 69 trees, making 37.5 % of total number of trees Small-leaved linden (*Tilia cordata*) – 9 trees, making 4.9 %, European birch (*Betula pendula*) – 39 trees, making 21.2 % of total number of trees.

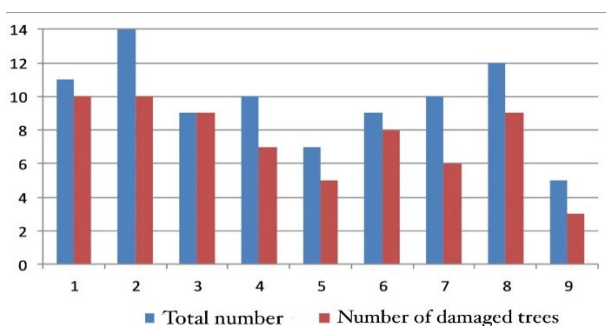
**Table 1**Degree of tree species infestation by mistletoe white (*Viscum album*) in the study areas of Poltava

Title	№ plot	District	Total number of trees	Number of trees affected by <i>Viscum album</i>	Degree of damage (%)	Number of trees from the total number (%)
English tree ( <i>Robinia pseudoacacia</i> )	1	Shevchenkivskiyi	11	10	11,5	91
	2		14	10	11,5	71,4
	3		9	9	10,3	100
	4	Kyivskiyi	10	7	8	70
	5		7	5	5,7	71,4
	6		9	8	9	89
	7	Podilskiyi	10	6	7	60
	8		12	9	10,3	75
	9		5	3	0,04	60
<b>In total:</b>			<b>87</b>	<b>67</b>	<b>77</b>	<b>77</b>
Norway maple ( <i>Acer platanoides</i> )	1	Shevchenkivskiyi	18	9	6,8	50
	2		14	9	6,8	64,2
	3		15	13	9,8	87
	4	Kyivskiyi	16	8	6	50
	5		14	7	5,3	50
	6		13	5	3,8	39
	7	Podilskiyi	13	7	5,3	54
	8		15	5	3,8	33,3
	9		14	6	4,5	43
<b>In total:</b>			<b>132</b>	<b>69</b>	<b>52,3</b>	<b>52,3</b>
Small-leaved linden ( <i>Tilia cordata</i> )	1	Shevchenkivskiyi	9	5	7	56
	2		10	7	9,9	70
	3		9	6	8,5	67
	4	Kyivskiyi	8	4	5,6	50
	5		6	2	4,2	33,3
	6		7	4	5,6	57,1
	7	Podilskiyi	7	4	5,6	57,1
	8		8	4	5,6	50
	9		7	3	2,8	43
<b>In total:</b>			<b>71</b>	<b>39</b>	<b>55</b>	<b>55</b>
European birch ( <i>Betula pendula</i> )	1	Shevchenkivskiyi	8	3	5,3	38
	2		7	1	1,8	14,3
	3		8	-	-	0
	4	Kyivskiyi	9	2	3,6	22,2
	5		5	1	1,8	20
	6		6	1	1,8	16,7
	7	Podilskiyi	5	1	1,8	20
	8		4	-	-	0
	9		4	-	-	0
<b>In total:</b>			<b>56</b>	<b>9</b>	<b>16,07</b>	<b>16,17</b>
<b>Total number:</b>			<b>346</b>	<b>184</b>		<b>53,2</b>

Source: Author's research.

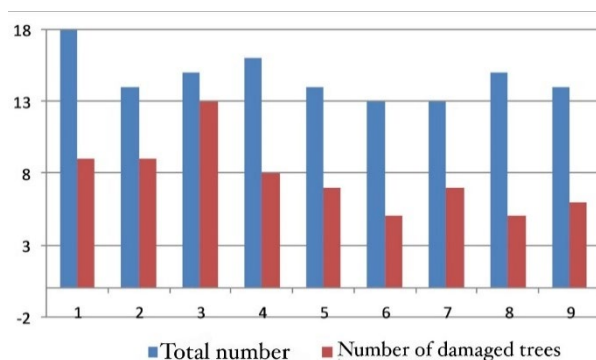
Thus, based on the data obtained, we can conclude that among tree plantations of Poltava there is a tendency of significant affection of trees by mistletoe white, which averages more than 53.2 %. General characteristic of the degree of *Viscum album* affection of tree plantations is presented in the figures (Fig. 2–4).

Based on the data of Fig. 2 it can be concluded that the greatest quantity of *Acacia pseudoacacia* trees was fixed on monitoring site № 2 – 14 trees (degree of invasion is 11,5 % and 2,9 % from total quantity of trees).



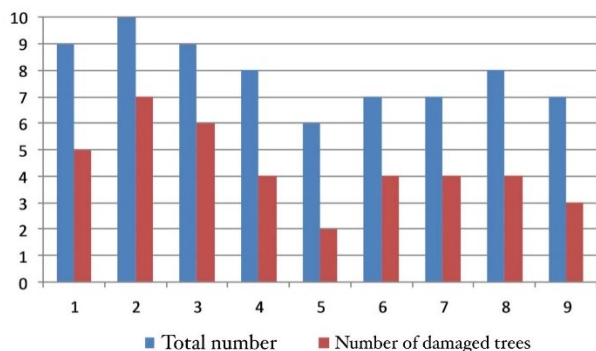
**Fig. 2.** General characteristics of the degree of *Viscum album* infestation of *Acacia pseudoacacia* at monitoring sites in Poltava

From data of Fig. 3 it may be concluded that the greatest number of plantations of Norway maple was observed on monitoring plot No. 1 (18 trees), the most affected were maples on monitoring plot No. 3 (the degree of their affection 9,8 % and 3,7 % of the total number of trees).



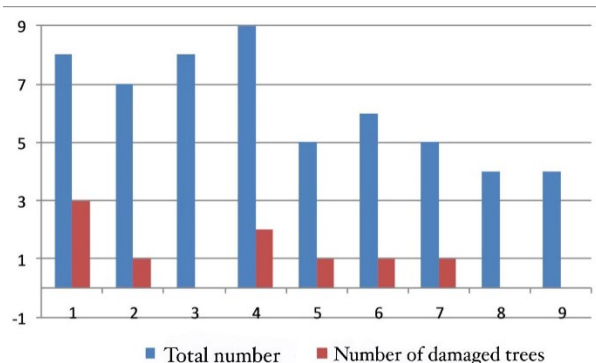
**Fig. 3.** General characteristics of the degree of *Viscum album* infestation in plantations of Norway maple (*Acer platanoides*) at monitoring sites in Poltava

Based on the data of Fig. 4 we can conclude that the greatest number of plantations of the floodplain European birch was observed at monitoring site No. 2 (10 trees), and the greatest number of affected trees was also recorded at this site. Their degree of infestation was 9.9 % and 2% of total dendroflora, respectively.



**Fig. 4.** General characteristics of the extent of damage to *Viscum album* of European birch (*Betula pendula*) at monitoring sites in Poltava

Based on these data of Fig. 5, we can conclude that the greatest number of green spaces is registered at monitoring plot No. 4 (9 trees), while the greatest number of diseased trees is registered at plot No. 1. The extent of their affection was 5.3 % and 0.8 % according to the total number of dendroflora.



**Fig. 5.** General characteristics of the extent of infestation of heartleaf linden (*Tillia cordata*) by *Viscum album* at monitoring sites in Poltava

After analyzing the data obtained on the degree of mistletoe colonization of the studied tree species (*Viscum album* L), we can conclude that, among the studied species, common acacia (*Robinia pseudoacacia*) is the most affected, 19.4 % of the total number of trees, while *Tillia cordata* – 2.6 %. In our opinion, this is explained by biological features of trees, namely the morphological structure of tree bark and their age, which primarily affects the germination rate of mistletoe white seeds on the tree. The nature of tree plant infestation by mistletoe white was assessed using a conventional 5-point scale (Table 2).

**Table 2**

Evaluation scale of tree damage by white mistletoe (*Viscum album* L)

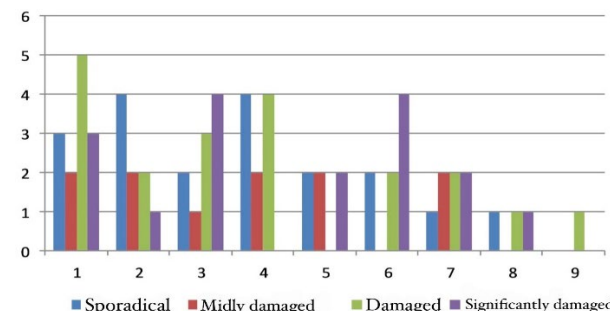
Degree of damage	Number of mistletoe cults on one tree	Degree of damage	Number of mistletoe cults on one tree
Sporadical	up to 5	Sporadical	up to 5
Moderately affected	5	Moderately affected	10
Severely affected	10	Severely affected	15
Heavily affected	15 and more	Heavily affected	15 and more

Source: [12].

We used this scale to determine the degree of infestation) of the studied tree species by mistletoe white (*Viscum album* L.).

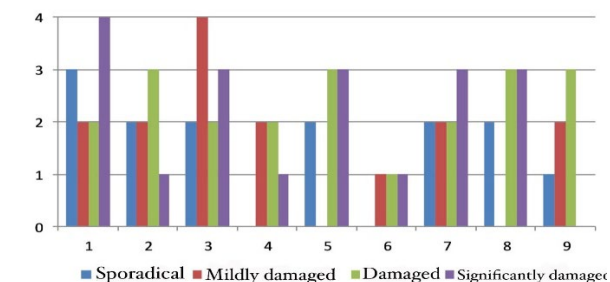
In the course of our research, we found that on the territory of the monitoring sites in Poltava among examined tree species the following trees were identified: 46 trees affected by white mistletoe alone, 58 trees affected moderately, 43 trees affected moderately, and 39 trees affected very badly. Among the surveyed tree species of Poltava, we found: 46 trees singly affected by white mistletoe, 58 trees affected, 43 moderately affected and 39 trees very affected. Of these, *Robinia pseudoacacia* was the most affected at 19.4 %, while *Tillia cordata* was the least affected at 2.6 % of the surveyed sites.

Overall, according to the assessment scale, the vast majority of trees at the study sites are in the affected category. A separate characterization of the degree of infestation of the studied tree species is given in the following diagrams (Figs. 6–9).



**Fig. 6.** Assessment of the degree of damage of *Viscum album* to plantations of common robinia (*Robinia pseudoacacia*) at monitoring sites in Poltava on an assessment scale

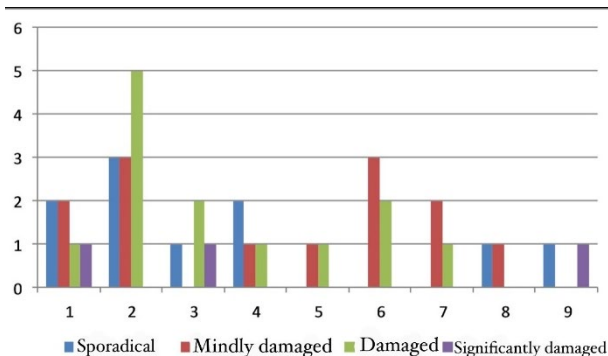
According to the diagram, affected trees of *Robinia pseudoacacia* occur most frequently at Site No.4 (4 trees), moderately affected – 2 trees at 1–7, affected at 1 (5 trees) and very affected – 4 trees at 3 and 6. In total, the greatest number of affected trees was 20 (Fig. 7).



**Fig. 7.** Assessment of *Viscum album* infestation degree of maple (*Acer platanoides*) plantations at monitoring sites of Poltava according to the assessment scale

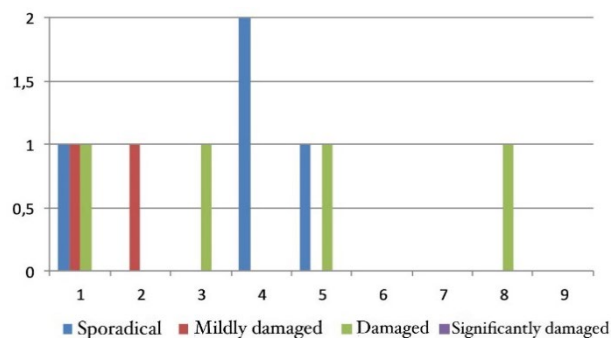
It was established from the diagram that among maple trees, 3 trees were the most severely affected at Research Site No. 1, 4 trees at Research Site No. 3 were moderately affected, 3 trees at Research Sites No. 2, 5, 8, 9 and very affected 4 trees at Research Site No. 1. Among the surveyed maple trees, 21 trees were the most affected.

Considering the data of the diagram (Fig. 8) we can conclude that among the trees of the species studied, the most singly affected individuals were found on the site number 2 (3 trees), moderately affected individuals were found on sites 2 and 6, affected on the site number 2 (5 trees) and very affected European birch trees (one tree) were found on the sites 1,3 and 9. In general, among the surveyed trees, the greatest number on the assessment scale fell into the category of moderately affected and affected trees, with an average of 13 specimens of each type.



**Fig. 8.** Assessment of the degree of *Viscum album* infestation in stands of *Betula pendula* at monitoring sites in Poltava using an assessment scale.

On the basis of data of Fig. 9 it was established that among examined linden trees the trees most singly infested by *Tillia cordata* were found on the monitoring plot № 4; moderately infested - one specimen per one tree was found on the sites № 1, 2; one infested tree was found on the sites № 1, 3, 5, 8 and very affected – none was met on the surveyed sites.



**Fig. 9.** Assessment of the degree of *Viscum album* infestation in heartleaf linden (*Tillia cordata*) stands at monitoring sites in Poltava on a scale of assessment

Thus, in the course of our research we found that the most affected tree species at the study sites were English tree (*Robinia pseudoacacia*), Norway maple (*Acer platanoides*), less affected European birch (*Betula pendula*) and less affected Small-leaved linden (*Betula pendula*).

Overall, at all monitored sites, the number of: single affected trees was – 13.3 %; moderately affected – 12.4 %; 16.8 % of diseased trees; very affected – 11.3 %.

Thus, among all the surveyed trees, the highest number of all diseased trees was 16.8 %, according to the evaluation scale. Based on the obtained data, we can make a comparative characteristic of the degree of infestation (*Viscum album* L.) of the main tree species of Poltava (Table 3).

**Table 3**

Comparative characteristic of the degree of damage (*Viscum album* L.) of the main tree species in Poltava

Name of the plant	Degree of damage to the total number of trees (%)		
	Shevchenkivskiyi District	Kyivskiyi District	Podilskiyi District
English tree ( <i>Robinia pseudoacacia</i> )	9	7	3,2
Norway maple ( <i>Acer platanoides</i> )	8,7	4	6,6
European birch ( <i>Betula pendula</i> )	6	3,2	2
Small-leaved linden ( <i>Tillia cordata</i> )	1,5	1,2	0,3
<b>Total number:</b>	<b>25,2</b>	<b>15,4</b>	<b>12,1</b>

Thus, we found that in Poltava, in accordance with the assessment scale, the level of damage by *Viscum album* L. to trees such as *Robinia pseudoacacia*, *Acer platanoides*, *Betula pendula*, *Tillia cordata* is in the category of affected trees. In addition, morphological features of the semi-parasite itself, namely the size and color of the leaves, can be used as a criterion for the degree of tree damage by mistletoe white [21, 24]. Thus, during our study, we found that the leaves of heavily infested tree species are dark green, large and succulent, while those of less infested species are, on the contrary, light green, closer to yellowish.

Active mistletoe control began just a few years ago. Unfortunately, there are few methods of combating mistletoe now. The simplest and most common method is the pruning of diseased branches or even whole trees. The type of pruning depends on the degree of infestation. If the tree has a significant number of branches but the trunk is healthy, the most effective method of sanitation is topping - removing the entire crown. It should be noted that the cut branches and parts of the trunk of the tree should be burned or taken to a designated area for further disposal. The affected branches should not be left to dry out; mistletoe survives for a long time. After pruning, the crown of the tree must not be completely symmetrical in order to avoid sudden changes in the pressure on the root system (wind and rainfall). To form a symmetrical crown, healthy branches can be pruned or the tree can be reinforced with reinforcing or keying techniques. In addition to the measures mentioned above, other methods of dealing with mistletoe are also suggested. When the first mistletoe leaves appear, for instance, these should be cut off along with the relevant section of the branch. This prolongs the life of the tree because it is not possible to defeat a five to seven-year-old plant by simply removing it: mistletoe spreads in the crown. They have also tried to combat it with chemicals but this has had a negative effect on the tree. A comprehensive programme must therefore be

implemented, ranging from prevention to short-term crown formation (although even this does not last long), because once the branches have been removed, the tree spends its reserves for further growth and the earlier they appear, the mistletoe penetrates the tree more quickly. Therefore it is important to introduce a monitoring programme for the timely inspection and removal of mistletoe, and to plant trees that are resistant to the disease.

To date, mistletoe is destroying Ukrainian trees at a geometric rate. It is impossible to remain indifferent to this problem. In recent years, the mistletoe infestation has become an ecological disaster. Therefore, the fight against mistletoe should not be spontaneous, but organized and consistent.

## Conclusions

Studies have shown that recently in biotopes of Poltava city there is a negative trend of mistletoe white (*Viscum album* L.) infestation of deciduous trees. Among researched areas greenery plantations of Shevchenkivskiy district are the most affected (25.2 %), greenery plantations of Podilskiy district (12.1 %) are the least affected. In our opinion, the reason for this is different species composition of the green areas. In particular, *Robinia pseudo-acacia* and *Acer platanoides* dominate in green spaces in Shevchenkivskiy district. These trees have very cracked bark, which in turn positively affects the degree of mistletoe white seed infestation.

A significant process of infestation of street trees can be explained by significant anthropogenic pressures on them, namely a high degree of technogenic impact, soil contamination with heavy metals, dry urban air, mechanical damage, which in turn weakens their immunity and reduces resistance to pests, diseases and semi-parasites. In our opinion, one of the main reasons of mistletoe affection of park plantations is close proximity of infected and healthy trees, which is aggravated by significant anthropogenic pressure and selectivity of the parasite to predominant trees in the dendroflora. Today, this problem in Poltava city has become so widespread that if sufficient preventive measures are not taken now and effective projects to control this semi-parasite are not developed and implemented, the only solution to this problem will be mass felling of green spaces of the urban ecosystem after some time.

## Conflict of interest

The authors state that there is no conflict of interest.

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