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PHYSIOLOGICAL HARMFULNESS OF XYLOPHAGOUS INSECTS IN POPLAR AND ASPEN STANDS IN THE LEFT-BANK FOREST-STEPPE

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The aim of the research was to evaluate the physiological harmfulness of xylophagous insects for *Populus* sp. in the Left-Bank Forest-Steppe considering the ability of these insects for colonizing and damaging trees with certain health, vectoring the pathogens, as well as host range and occurrence. 72 insect species were analyzed, particularly 40 Cerambycidae, 19 Buprestidae, 7 Curculionidae, 2 Sesiidae, and 3 Cossidae. The proportion of abundant species was the highest among Scolytinae: Xyleborini. Species with a high physiological activity predominate among monophagous insects, particularly, *Agrilus suvorovi*, *Cryptorhynchus lapathi*, *Xyleborus cryptographus*, *Paranthrene tabaniformis*, *Acossus terebra*. Only five species (*S. populnea*, *S. octopunctata*, *S. perforata*, *S. scalaris*, *S. carcharias*) can significantly damage the trees by maturation feeding on foliage and bark of branches. Abundant xylophagous species have the highest average score in physiological harmfulness. It is almost twice as low in common species and almost two times less in rare and single species. High physiological harmfulness (10 and more) for poplars and aspens is estimated for nineteen xylophagous species, particularly, 13 for *S. populnea* and *S. carcharias,* and 12 for *Cryptorhynchus lapathi, Trypodendron signatum, Tremex fuscicornis,* and Xyleborini species.
K e y w o r d s : physiological activity, nutrition range, occurrence, maturation feeding, pathogens vectoring.

Introduction. Poplars and aspens (*Populus* sp.) are common in forest stands, shelterbelts, rural landscaping, and in special plantations such as short rotation woody crops, promising tree species for biofuel and bioenergy production (Poplars and Willows 2014, Vysotska & Tkach 2016). These plants provide timber, rehabilitate degraded land, and mitigate climate change (Charles et al. 2014).

Poplars and aspens are host trees for dozens of insects, so-called pests (Steed & Burton 2015). Wood-boring insects browse the galleries in the stem or branches that interrupt sap circulation and promote the establishment of plant pathogens (Davydenko et al. 2014). Some of these insects may additionally weaken trees due to maturation feeding by foliage, bark, or phloem (Lieutier et al. 2004). All these effects comprise the physiological harmfulness of wood-boring insects, whereas their technical harmfulness depends on the size and depth of the galleries, their location at the stem, and the timber value of the given tree species.

An approach of wood-boring insects harmfulness assessment was suggested by E. Mozolevskaya (1974) and implemented for oak (Meshkova & Kukina 2011, Bieliavtsev & Meshkova 2019), pine (Skrylnik 2013, Meshkova 2017), spruce (Kukhta et al. 2014), birch (Skrylnik et al. 2019), and elm (Nikulina & Martynov 2021). It was shown that the harmfulness of the same insect species varies significantly depending on the environmental conditions and population density.

The aim of the research was to evaluate the physiological harmfulness of xylophagous insects for *Populus* sp. in the Left-Bank Forest-Steppe, Ukraine, considering the ability of these insects to colonize trees with certain health condition, to damage trees at maturating feeding and vector the pathogens, as well as the host range, and occurrence.

Materials and Methods. The research was carried out in 2019–2022 in the forests of Myrhorodsky and Lubensky forest enterprises in Poltava region, Trostianetsky, Okhtyrsky, and Shostkynsky forest enterprises in Sumy region, Zmiyivsky, Gutiansky, Vovchansky, Zhovtnevy forest enterprises in Kharkiv region, in the archive plantation of poplar clones in Pivdenne Forestry in Kharkiv Forest Research Station of Ukrainian Research Institute of Forestry & Forest Melioration named after G.M. Vysotsky, in the arboretum of the State Biotechnological University (Kharkiv region) as well as in the field and road protective forest shelterbelts in the given regions. The collections and research done by Yu. Skrylnik since 2006 in the specified territory, particularly in Zmiiv district (since 2020, Chuhuiv district) near the village of Haidary, in Homilshanski Lisy National Nature Park, in Krasnokutsk district (since 2020, Bohodukhiv district), near the village of

Krasnokutsk, and Kharkiv district, Dokuchaevo, 3 km west from the village of Rohan were also included into the analysis.

Insects were collected by mowing, manual collection, using window traps, an inspection of trees, collection of preimaginal stages under the bark and in the wood of trees as well as insect rearing in the fragments of stems and branches in an insectarium with inserted nets or ventilation holes respectively (Meshkova et al. 2009). After the adults' emergence, all insects were identified.

The health condition of the colonized trees was evaluated according to Sanitary Forests Regulations in Ukraine (2016). Each tree was classified by health condition classes (1^{st} – healthy; 2^{nd} – weakened; 3^{rd} – severely weakened; 4^{th} – dying; 5^{th} – recently died; 6^{th} – died over a year ago).

In the analysis, only those insect species used, whose development in the stems and branches of *Populus* sp. was proved by our research (Skrylnik et al. 2019, 2023, Zhupynska 2019) and /or supported by publications (Bily 2002, Yanitsky 2007, Bartenev 2009, Prokhorov 2010, Skrylnik & Terekhova 2011, Terekhova & Salnitskaya 2014, Terekhova & Skrylnik 2014, Nikulina et al. 2015, Bochniarz 2017, Danilevsky 2020).

By the host range, insect species that developed only under the bark and in the wood of *Populus* sp. were considered monophagous. The insect species that developed under the bark and in the wood of Salicaceae (*Populus* sp. and *Salix* sp.) were considered oligophagous. Other xylophagous insect species were considered polyphagous.

The occurrence of insect species was assessed on the following scale: single – up to 0.1% of the total (1 point), rare – 0.1–1% (2 points), common – 1–5% (3 points), abundant – more than 5% (4 points) (Meshkova et al. 2022). An average score of occurrences for the insect groups by nutrition type or insect taxa was evaluated as the arithmetic mean of the score for each member of the respective group.

The physiological harmfulness of xylophagous insects was calculated as the sum of scores for their physiological activity (ability to colonize trees under certain health condition), ability to damage the trees during maturation feeding, and ability to vector the pathogens (Mozolevskaya 1974).

Physiologically active insect species capable of colonizing the trees of the 1st–2nd categories of health condition (healthy and weakened trees) are considered the most aggressive and get 10 points. Insects capable of colonizing trees of the 3^{rd}–4^{th} categories of health condition are considered as medium aggressive and get 1 point. Insects capable of colonizing only trees of the 5^{th}–6^{th} categories of health condition (dead trees) get 0.1 points. Such insects have no physiological effects but may worsen timber quality, which is important for evaluatingf technical harmfulness (Mozolevskaya 1974).

The ability of insects to damage trees during maturation feeding was evaluated with 2 points (noticeable damage), 1 point (slight damage), or 0 points (maturation feeding is absent).

As most insects are potential carriers of pathogens on their body surface, the score 0 was given to those species that colonize only dead trees or small dead branches of living trees. Score 2 was given to species of the tribe Xyleborini (*Anisandrus*, *Xyleborinus* and *Xyleborus* spp.), *Trypodendron signatum* (Fabricius, 1787) (Coleoptera: Curculionidae: Scolytinae) and to *Tremex fuscicornis* (Fabricius, 1787) (Hymenoptera: Siricidae). These insects bring bacteria and fungi into their galleries for providing cellulose assimilation to larvae. Together with these fungi and bacteria, pathogens enter the galleries, which additionally weaken the tree (Pažoutová & Šrůtka 2007, Sarikaya 2015). Score 1 was given to other analyzed xylophages colonizing living trees.

Results and Discussion. The list of xylophagous insects colonizing poplars and aspens trees in the Left-Bank forest steppe covers 72 species, particularly 66 Coleoptera (92 %), 5 Lepidoptera (7 %), and 1 Hymenoptera (1 %) (Table 1). Coleoptera was represented by 40 Cerambycidae, 19 Buprestidae, and 7 Curculionidae species, the last family included 1 Cryptorhynchinae and 6 Scolytinae species. Lepidoptera was represented by 2 Sesiidae and 3 Cossidae species.

Table 1

Score of physiological harmfulness of xylophagous insects in *Populus* sp. in the Left-Bank Forest-Steppe, points

Insect species	Occurrence	Range of nutrition	Physiological activity	Maturation feeding	Pathogen vectoring	Physiological harmfulness
Coleoptera: Cerambycidae						
Aegosoma scabricornis (Scopoli, 1763)	single	polyphagous	1	0	0	1
Prionus coriarius (Linnaeus, 1758)	single	polyphagous	0.1	0	0	0.1
Rhamnusium gracilicorne Thery, 1894	rare	polyphagous	1	0	0	1
Rhagium mordax (Degeer, 1775)	single	polyphagous	1	1	1	3
Dinoptera collaris (Linnaeus, 1758)	rare	polyphagous	1	0	0	1
Rutpela maculata (Poda, 1761)	common	polyphagous	0,.	0	0	0.1
Leptura aurulenta Fabricius, 1792	single	polyphagous	0.1	0	0	0.1
Leptura quadrifasciata Linnaeus, 1758	rare	polyphagous	0.1	0	0	0.1
Lepturalia nigripes (Degeer, 1775)	single	polyphagous	0.1	0	0	0.1
Strangalia attenuata (Linnaeus, 1758)	rare	polyphagous	0.1	0	0	0.1
Stenurella melanura (Linnaeus, 1758)	rare	polyphagous	0.1	0	0	0.1
Necydalis major Linnaeus, 1758	single	polyphagous	0.1	0	0	0.1
Trichoferus campestris (Faldermann, 1835)	rare	polyphagous	1	0	0	1
Purpuricenus kaehleri (Linnaeus, 1758)	single	polyphagous	1	0	0	1
Cerambyx scopolii Fuesslins, 1775	common	polyphagous	1	0	0	1
Aromia moshata (Linnaeus, 1758)	single	oligophagous	1	0	0	1
Obrium cantharinum (Linnaeus, 1767)	single	polyphagous	1	0	0	1
Ropalopus clavipes (Fabricius, 1775)	single	polyphagous	1	0	0	1
Ropalopus macropus (Germar, 1824)	rare	polyphagous	1	0	0	1
Chlorophorus figuratus (Scopoli, 1763)	common	polyphagous	1	0	0	1
Chlorophorus varius (Müller, 1766)	rare	polyphagous	1	0	0	1
Xylotrechus arvicola (Olivier, 1795)	rare	polyphagous	1	0	0	1
Xylotrechus rusticus (Linnaeus, 1758)	abundant	polyphagous	10	0	0	10
Mesosa curculionoides (Linnaeus, 1761)	common	polyphagous	10	1	0	11
Mesosa nebulosa (Fabricius, 1781)	rare	polyphagous	1	1	0	2
Lamia textor (Linnaeus, 1758)	single	oligophagous	1	1	0	2

Continuation of Table 1

Insect species	Occurrence	Range of nutrition	Physiological activity	Maturation feeding	Pathogen vectoring	Physiological harmfulness
Anaesthetis testacea (Fabricius, 1781)	rare	polyphagous	1	0	0	1
Pogonocherus hispidus (Linnaeus, 1758)	rare	polyphagous	1	0	0	1
Pogonocherus hispidulus (Piller et Mitt., 1783)	rare	polyphagous	1	0	0	1
Aegomorphus clavipes (Schrank, 1781)	rare	polyphagous	1	0	0	1
Leiopus punctulatus (Paykull, 1800)	single	polyphagous	1	1	0	2
Tetrops praeusta (Linnaeus, 1758)	common	polyphagous	1	1	0	2
Saperda populnea (Linnaeus, 1758)	common	polyphagous	10	2	1	13
Saperda octopunctata (Scopoli, 1772)	single	oligophagous	1	2	1	4
Saperda perforata (Pallas, 1773)	rare	polyphagous	1	2	1	4
Saperda scalaris (Linnaeus, 1758)	common	polyphagous	1	2	1	4
Saperda carcharias (Linnaeus, 1758)	common	oligophagous	10	2	1	13
Stenostola ferrea (Schrank, 1776	single	oligophagous	1	1	0	2
Menesia bipunctata (Zoubkoff, 1829)	single	oligophagous	1	1	0	2
Oberea oculata (Linnaeus, 1758)	single	oligophagous	1	1	0	2
Coleoptera: Buprestidae						
Acmaeoderella flavofasciata (Piller & Mitterpacher, 1783)	rare	polyphagous	1	0	0	1
Dicerca aenea (Linnaeus, 1766)	rare	polyphagous	1	0	0	1
Dicerca alni (Fischer von Waldheim, 1824)	rare	polyphagous	1	0	0	1
Poecilonota variolosa (Paykull, 1799)	rare	polyphagous	1	1	0	2
Eurythyrea aurata (Pallas, 1776)	single	polyphagous	1	0	1	2
Eurythyrea austriaca (Linnaeus, 1767)	single	polyphagous	1	0	0	1
Trachypteris picta (Pallas, 1773)	rare	polyphagous	10	1	0	11
Agrilus lineola Kiesenwetter, 1857	rare	oligophagous	1	1	0	2
Agrilus viridis (Linnaeus, 1758)	abundant	polyphagous	10	1	0	11
Agrilus convexicollis Redtenbacher, 1849	single	polyphagous	1	1	1	3
Agrilus cyanescens (Ratzeburg, 1837)	single	polyphagous	1	1	0	2
Agrilus auricollis Kiesenwetter, 1857	single	polyphagous	1	1	0	2
Agrilus pratensis (Ratzeburg, 1837)	rare	oligophagous	1	1	0	2

Continue Table 1

Insect species	Occurrence	Range of nutrition	Physiological activity	Maturation feeding	Pathogen vectoring	Physiological harmfulness
Agrilus pseudocyaneus Kiesenwetter, 1857	single	oligophagous	1	1	0	2
Agrilus subauratus (Gebler, 1833)	single	polyphagous	10	1	0	11
Agrilus roscidus Kiesenwetter, 1857	single	polyphagous	1	1	1	3
Agrilus ater (Linnaeus, 1767)	single	oligophagous	1	1	0	2
Agrilus guerini Lacordaire, 1835	single	oligophagous	1	1	0	2
Agrilus suvorovi Obenberger, 1935	rare	monophagous	10	1	0	11
Coleoptera: Curculionidae: Cryptorhynchinae						
Cryptorhynchus lapathi (Linnaeus, 1758)	single	monophagous	10	1	1	12
Coleoptera: Curculionidae: Scolytinae						
Anisandrus dispar (Fabricius, 1792)	abundant	polyphagous	10	0	2	12
Anisandrus maiche Kurentzov, 1941	rare	polyphagous	10	0	2	12
Xyleborinus saxesenii (Ratzeburg, 1837)	abundant	polyphagous	10	0	2	12
Xyleborus cryptographus (Ratzeburg, 1837)[1]	single	monophagous	10	0	2	12
Trypodendron signatum (Fabricius, 1787)	common	polyphagous	10	0	2	12
Trypophloeus granulatus (Ratzeburg, 1837)	single	oligophagous	1	0	1	2
Lepidoptera: Sesiidae						
Paranthrene tabaniformis (Rottemburg, 1775)	rare	monophagous	10	0	1	11
Sesia apiformis (Clerck, 1759)	single	polyphagous	10	0	1	11
Lepidoptera: Cossidae						
Zeuzera pyrina (Linnaeus, 1761)	common	polyphagous	10	0	1	11
Cossus cossus (Linnaeus, 1758)	common	polyphagous	10	0	1	11
Acossus terebra (Denis & Schiff., 1775)	single	monophagous	10	0	1	11
Hymenoptera: Siricidae						
Tremex fuscicornis (Fabricius, 1787)	single	polyphagous	10	0	2	12

Cerambycidae were represented by oligophages and polyphages (Table 2). Polyphages make up 75% of the species and predominate in all families. Oligophages were found only among cerambycids and buprestids. Monophages were absent among the cerambycids and siricids and in the rest of the families they were represented by one species in each, in curculionids – by one species each in the subfamilies of Cryptorhynchinae and Scolytinae (see Table 2).

[1] *Xyleborus cryptographus* (Ratzeburg, 1837) has been moved to a recently resurrected genus and should now be referred to as *Heteroborips cryptographus* (Ratzeburg, 1837) (Lindelöw & Jonsell 2022).

Table 2

Distribution of xylophages by nutrition type (number of species / %)

Insect taxa	Nutrition type			Total
	Monophagous	Oligophagous	Polyphagous	
Cerambycidae	0 / 0.0	7 / 17.5	33 / 82.5	40 / 100.0
Buprestidae	1 / 5.3	5 / 26.3	13 / 68.4	19 / 100.0
Curculionidae: Cryptorhynchinae	1 / 100.0	0 / 0.0	0 / 0.0	1 / 100.0
Curculionidae: Scolytinae	1 /16.7	1 / 16.7	4 / 66.7	6 / 100.0
Cossidae	1 / 33.3	0 / 0.0	2 / 66.7	3 / 100.0
Sessidae	1 / 50.0	0 / 0.0	1 / 50.0	2 / 100.0
Siricidae	0 / 0.0	0 / 0.0	1 / 100.0	1 / 100.0
Total	5 / 6.9	13 / 18.1	54 / 75.0	72 / 100.0

Among the xylophages inhabiting poplars and aspen trees, single and rare species predominate. Common and abundant species make up only 5.6% (Table 3).

Table 3

Distribution of xylophages by occurrence (number of species / %)

Insect taxa	Occurrence				Total
	single	rare	common	abundant	
Cerambycidae	16 / 40.0	15 /37.5	8 / 20.0	1 / 2.5	40 / 100.0
Buprestidae	10 / 52.6	8 / 42.1	0 / 0.0	1 / 5.3	19 / 100.0
Curculionidae: Cryptorhynchinae	1 / 100.0	0 / 0.0	0 / 0.0	0 / 0.0	1 / 100.0
Curculionidae: Scolytinae	2 / 33.3	1 / 16.7	1 / 16.7	2 / 33.3	6 / 100.0
Cossidae	1 / 33.3	0 / 0.0	2 / 66.7	0 / 0.0	3 / 100.0
Sessidae	1 / 50.0	1 / 50.0	0 / 0.0	0 / 0.0	2 / 100.0
Siricidae	0 / 0. 0	1 / 100.0	0 / 0.0	0 / 0.0	1 / 100.0
Total	31 / 43.1	26 / 44.4	11 / 15.3	4 / 5.6	72 / 100.0

A decrease in the number of species from single to abundant was noted among cerambycids and buprestids. There are no data for occurrence for other taxa due to the small number of species. Attention is drawn to the proportion of abundant species among scolytines – representatives of the Xyleborini tribe (see Tables 1, 3). *X. rusticus* is abundant and has a high physiological activity, but there is a lack of information on its maturation feeding and pathogen transmission.

The list of common species includes 7 cerambycids. Among them, *R. maculata* colonizes only dead trees, *S. carcharias* colonizes almost healthy trees and other species inhabit severely weakened and drying-up trees. Maturation feeding is reported for 3 common species of longhorn beetles. Imago *T. praeusta* feeds on foliage and *M. curculionoides* feeds on bark and leaves; they both can significantly weaken trees at high population density.

The list of rare species includes 15 cerambycids. All of them are polyphagous, 12 of them inhabit severely weakened and dying trees and 3 species inhabit dead trees. Maturation feeding of *M. nebulosa* and *S. perforata* is on the bark of branches and for the last species also on foliage.

Among the identified monophagous insects of poplars and aspens trees, species with a high physiological activity predominate; they are able to attack healthy and weakened trees (Fig. 1). These are *A. suvorovi*, *C. lapathi*, *X. cryptographus*, *P. tabaniformis*, *A. terebra*. At the same time, oligophages and polyphages are dominated by species with a medium physiological activity; they are able to colonize severely weakened and drying-up trees. Species with a low physiological activity, which colonize dead trees, were only noted among polyphages (see Table 1).

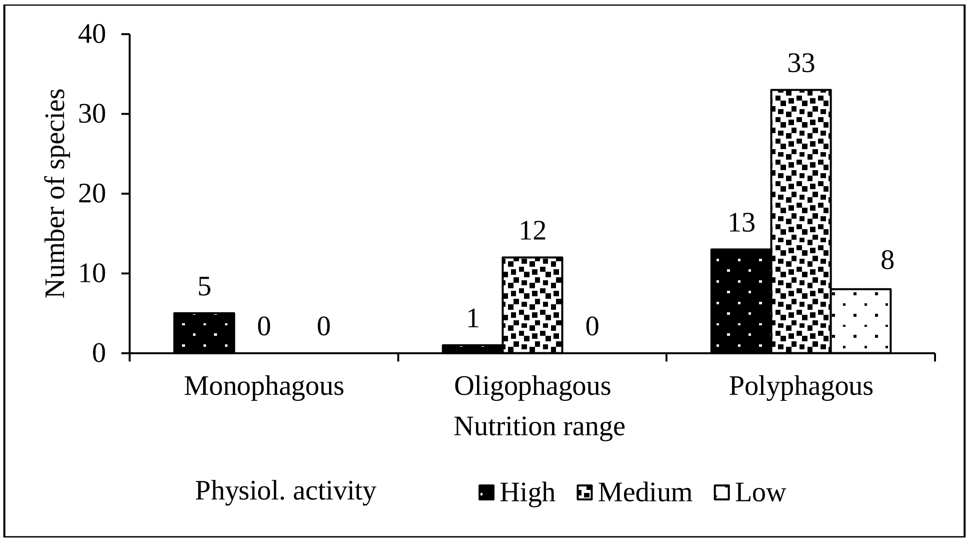

Fig. 1 – Distribution of xylophagous insects by physiological activity and nutrition type

Nineteen insect species are able to colonize healthy and weakened trees, including 5 abundant, 4 common, 4 rare, and 6 single species (Fig. 2).

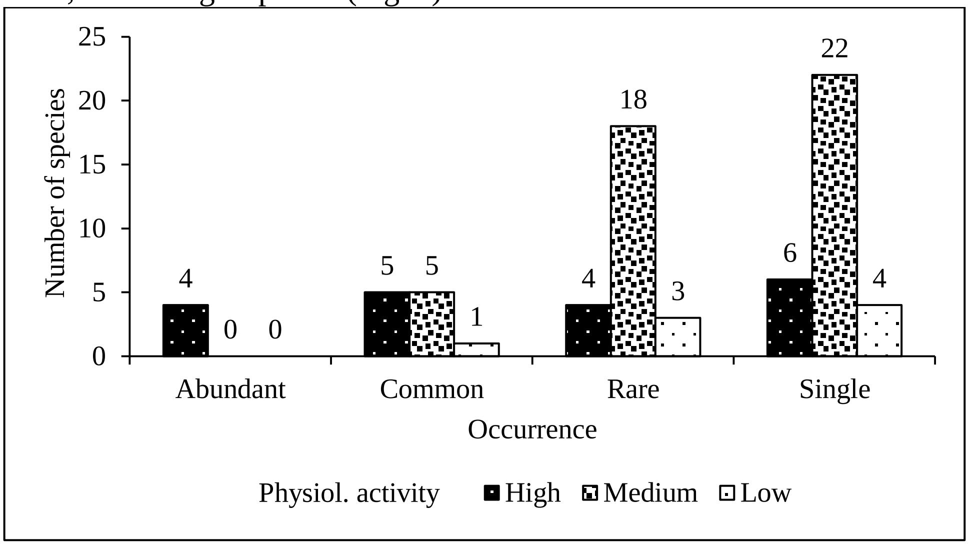

Fig. 2 – Distribution of xylophagous insects by physiological activity and occurrence

The abundant species are *X. rusticus*, *A. viridis*, *A. dispar*, *X. saxesenii*, and *C. cossus*. The common species are *S. populnea*, *S. carcharias*, *Z. pyrina*, and *T. signatum*. The rare species are *T. picta*, *A. suvorovi*, *A. maiche*, and *P. tabaniformis*. The single species are *A. subauratus*, *C. lapathi*, *X. cryptographus*, *S. apiformis*, *A. terebra*, and *T. fuscicornis* (see Table 1).

In particular stands, these ratios depend on the age of the trees and the ability of certain insect species to colonize different parts of the stem or branch.

Our study shows that most of the insect species analyzed do not have maturation feeding or feed on flowers or tree sap from bark wounds. 29 species feed on foliage and bark of branches, of which only 5 species can cause significant damage to trees during maturation feeding. These are longhorn beetles of the genus *Saperda* – *S. populnea*, *S. octopunctata*, *S. perforata*, *S. scalaris*, and *S. carcharias*. Among those species, *S. scalaris*, *S. populnea*, and *S. carcharias* are common, while *S. octopunctata* and *S. perforata* are single and rare, respectively (see Table 1).

The average score of the occurrence was the highest for polyphages (Fig. 3). Physiological activity contributes greatly to the physiological harmfulness of insects and is the highest for monophagous pests of poplar and aspen trees.

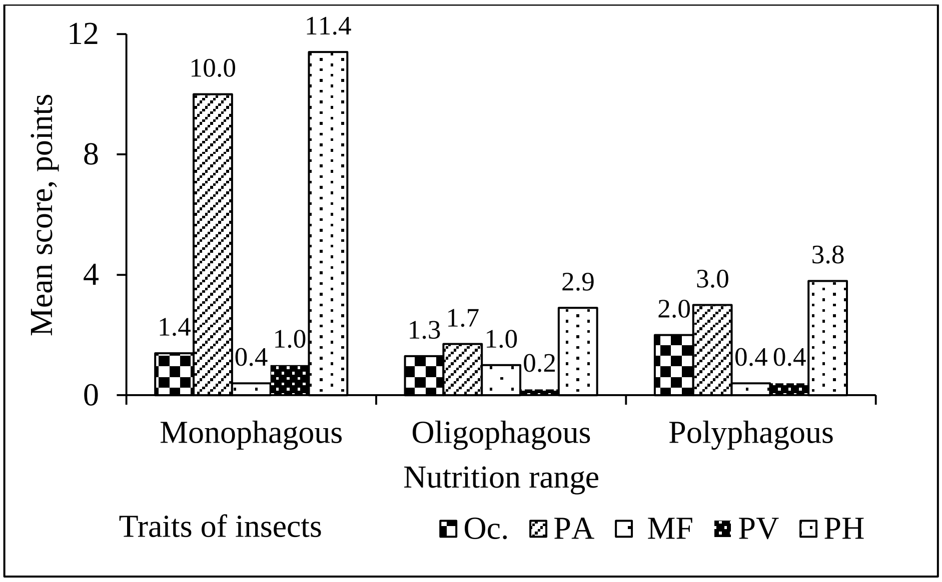

Fig. 3 – Mean score of some traits of physiological harmfulness for the xylophagous insects with different nutrition types (Oc. – occurrence; PA – physiological activity; MF – maturation feeding; PV – pathogen vectoring; PH – physiological harmfulness)

The average score of physiological activity and physiological harmfulness is the highest for the abundant xylophagous species (Fig. 4). It is almost twice as low for the common species, and almost two times less for the rare and single species.

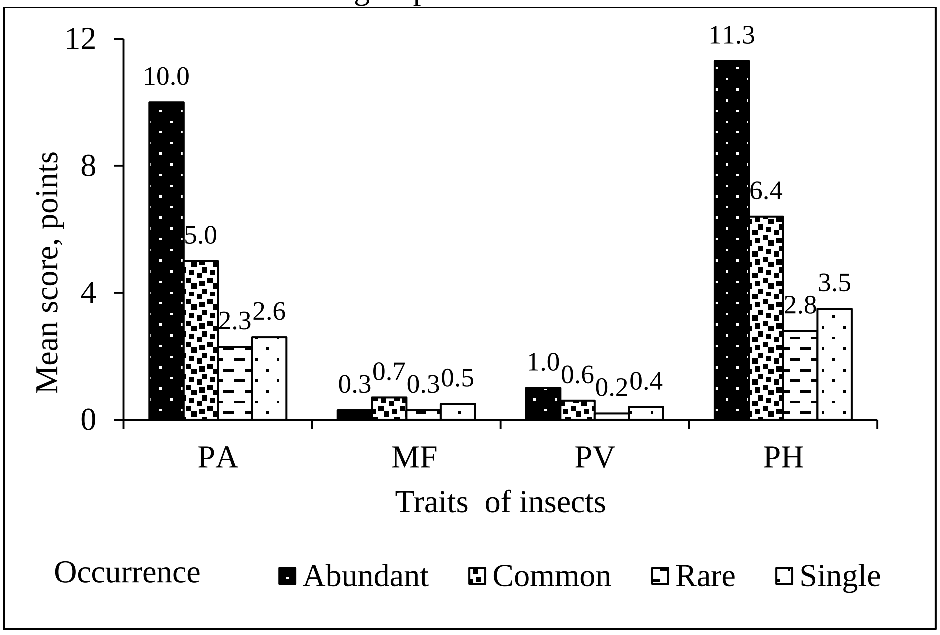

Fig. 4 – Mean score of some traits of physiological harmfulness for the xylophagous insects with different occurrences (Oc. – occurrence; PA – physiological activity; MF – maturation feeding; PV – pathogen vectoring; PH – physiological harmfulness)

If the occurrence is assessed in a particular stand, it may be possible to correct the score of physiological harmfulness, as has been done for Scots pine xylophagous insects (Meshkova 2017).

In total, 19 xylophagous species have high physiological harmfulness (10 points and more) for *Populus* sp. The physiological harmfulness of the polyphage *Saperda populnea* and the oligophage *S. carcharias* was estimated at 13 points.

The physiological harmfulness of 2 monophages (*C. lapathi* and *X. cryptographus*) and 5 polyphages (3 Xyleborini species, *T. signatum*, and *T. fuscicornis*) was estimated at 12 points. Nine species were estimated at 11 points, particularly, 3 monophages (*A. suvorovi*, *P. tabaniformis*, and *A. terebra*) and 6 polyphages (*T. picta*, *A. viridis*, *A. subauratus*, *S. apiformis*, *Z. pyrina* and

C. cossus). *X. rusticus* is rated with 10 points (see Table 1). The last species is one of the most destructive wood borers in northeast China; it damages poplar, and is listed as a domestic forestry quarantine pest (Li et al. 2014, Jing et al. 2017). At the same time, it is a protected species according to The IUCN Red List of Threatened Species and it fits in the LC category (Cálix et al. 2018). This information supports our conclusions that the harmfulness of certain insect species can vary significantly depending on region and ecological conditions.

Conclusions. Among 72 xylophagous insects inhabiting poplar and aspen trees in the Left-Bank Forest-Steppe, single and rare species predominate. The proportion of abundant species is the highest among Scolytinae: Xyleborini.

Among monophagous insects, species with a high physiological activity predominate, particularly, *A. suvorovi*, *C. lapathi*, *X. cryptographus*, *P. tabaniformis*, *A. terebra*. Among oligophages and polyphages, the species colonizing severely weakened and dying trees predominate. Species with low physiological activity, colonizing dead trees, predominate only among polyphages.

Only 5 species (longhorn beetles *S. populnea*, *S. octopunctata*, *S. perforata*, *S. scalaris*, *S. carcharias*) can cause significant damage to trees during maturation feeding on foliage and bark of branches.

The average score of physiological activity and physiological harmfulness is the highest for the abundant xylophagous species. It is almost twice as low for common species and almost two times less for rare and single species.

High physiological harmfulness (10 points and more) for poplar and aspen trees is estimated for 19 xylophagous species, particularly, 13 points for *S. populnea* and *S. carcharias*, and 12 points for *C. lapathi*, *T. signatum*, *T. fuscicornis*, and Xyleborini species.

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ФІЗІОЛОГІЧНА ШКІДЛИВІСТЬ КОМАХ-КСИЛОФАГІВ У НАСАДЖЕННЯХ ТОПОЛЬ І ОСИКИ ЛІВОБЕРЕЖНОГО ЛІСОСТЕПУ

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Метою дослідження було оцінити фізіологічну шкідливість ксилофагів, які заселяють тополі та осику, (*Populus* sp.) у Лівобережному лісостепу, з урахуванням спроможності цих комах заселяти дерева певного санітарного стану, особливостей додаткового живлення, спроможності переносити патогени дерев, трофічної спеціалізації та поширеності. Зазначені риси проаналізовано стосовно 72 видів комах, зокрема 40 Cerambycidae, 19 Buprestidae, 7 Curculionidae, 2 Sesiidae та 3 Cossidae. Частка масових видів є найбільшою серед представників триби Scolytinae: Xyleborini. Види з високою фізіологічною активністю переважають серед монофагів, зокрема *Agrilus suvorovi*, *Cryptorhynchus lapathi*, *Xyleborus cryptographus*, *Paranthrene tabaniformis*, *Acossus terebra*. Лише 5 видів (*S. populnea*, *S. octopunctata*, *S. perforata*, *S. scalaris*, *S. carcharias*) спроможні заподіяти значущу шкоду деревам під час додаткового живлення листям і корою гілок дерев. Середній бал оцінки фізіологічної шкідливості є найбільшим у масових видів ксилофагів, він є майже вдвічі меншим у звичайних видів, майже ще вдвічі меншим у рідкісних і поодиноких видів. Високу фізіологічну шкідливість стосовно рослин роду *Populus* визначено для 19 ксилофагів, причому найвищі оцінки мають *S. populnea* та *S. carcharias* (13 балів), а цей показник *Cryptorhynchus lapathi*, *Trypodendron signatum*, *Tremex fuscicornis* та видів триби Xyleborini оцінено у 12 балів.

Ключові слова: фізіологічна активність, трофічна спеціалізація, поширеність, додаткове живлення, перенесення патогенів.

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