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ECOLOGICAL AND FAUNISTIC ANALYSIS OF VERTEBRATE FAUNA OF THE "PEREMOGHY" PARK IN THE CITY OF CHERKASY

A. A. Bilushenko[1]

The work is devoted to the study of the species diversity of vertebrate fauna of the "Peremohy" Park in the city of Cherkasy. The park is located in the southwestern part of the city, is a monument of landscape art of local importance, artificially created, since it has in its structure both landscape and memorial components. Cherkasy City Zoological Park is an integral compositional element of this park, which emphasizes the multifunctionality of the place of the conducted research. The result of the conducted research was the presence of 77 species of wild vertebrate animals belonging to 16 orders, four known taxa: amphibians, reptiles, birds and mammals. The least numerous taxa are amphibians – three species (Pelophylax ribibunda, P. lessonae, Bufo virids) and reptiles – four species (Emys orbicularis, Trachemys scripta elegans, Lacerta agilis, Natrix natrix), which makes up 9% of the entire faunal complex of vertebrate fauna of the park. The most numerous systematic group was and remains birds – 54 species, which makes up almost 71% of the entire species complex of vertebrates, among which the most numerous is the order Passeriformes – 67%. Among the ecological groups of birds, the most numerous is dendrophilic – 69%. sclerophilous birds – 11%. Cavity-nesting birds (tree hollow) – 24%. Among the landscape-genetic faunal complexes, the most widely represented are birds of the non-moral European complex and ancient-non-moral complexes. Mammals make up 16 species – 20% of the complex of vertebrate fauna of the park. In the local fauna, there is a trend towards alien species for reptiles, birds, mammals. A quarter of the species composition of the species noted here have a protected status. Within the framework of the Bern Convention, 55 species of vertebrates. Eight species of bats are listed in the Red Book of Ukraine. These research results confirm that city parks are one of the richest in species diversity of places in city systems, and also confirm key ecological theories related to the gradient approach and the theory of island habitat for city parks.

Key words: *fauna, vertebrates, park "Peremohy", amphibians, reptiles, birds, mammals.*

ЕКОЛОГО-ФАУНІСТИЧНИЙ АНАЛІЗ ХРЕБЕТНИХ ТВАРИН ФАУНИ ПАРКУ «ПЕРЕМОГИ» В МІСТІ ЧЕРКАСИ

А. А. Білушенко

Робота присвячена дослідженню видового різноманіття хребетних тварин фауни парку «Перемоги» в місті Черкаси. Парк знаходиться в південно-західній частині міста, являється

[1] Candidate of Biological Sciences,
Senior Lecturer at the Department of General Ecology, Radiobiology and Life Safety
(National University of Life Resources and Environmental Sciences of Ukraine, Kyiv)
e-mail: Bat_Cherkassy@ukr.net
ORCID: 0009-0005-4084-9548

пам'яткою садово-паркового мистецтва місцевого значення, штучно створений, оскільки має у своїй структурі, як пейзажну, так і меморіальну складові. Черкаський міський зоологічний парк, являється невід'ємним композиційним елементом цього парку, що і підкреслює багатофункціональність місця проведених досліджень. Результатом проведених досліджень була наявність 77 видів диких хребетних тварин, що належать до 16 рядів, чотирьох відомих таксонів: земноводні, плазуни, птахи, ссавці. Найменш чисельними таксонами є земноводні – три види (Pelophylax ribibunda, P. lessonae, Bufo virids) та плазуни – чотири види (Emys orbicularis, Trachemys scripta elegans, Lacerta agilis, Natrix natrix), що складає 9 % від усього фауністичного комплексу хребетних фауни парку. Найчисельнішою систематичною групою як було, так і лишається птахи – 54 види, що складає майже 71 %, від усього видового комплексу хребетних, серед яких найчисельнішим є ряд Горобцкподібні (Passeriformes) – 67%. Серед екологічних груп птахів, найчисельнішою є дендрофільна – 69%. Склерофільні птахи – 11%, дуплогніздники – 24%. Серед ландшафтно-генетичних фауністичних комплексів, найбільш широко представлені птахи європейського неморального та стародавньо-неморального комплексів. Ссавці складають 16 видів – 20% комплексу хребетних фауни парку. У місцевій фауні простежується тенденція з боку чужорідних видів для плазунів, птахів, ссавців. Четверта частина видового складу відмічених тут видів, мають природоохоронний статус. У рамках Бернської конвенції 55 видів хребетних. Вісім видів рукокрилих занесені до Червоної книги України. Ці результати досліджень є підтвердженням того, що міські парки є одним із найбагатших на видове різноманіття місць в системах міст, а також підтверджує ключові екологічні теорії, які стосуються градієнтного підходу та теорії острівного середовища існування для міських парків.

***Ключові слова**: фауна, хребетні тварини, парк «Перемоги», земноводні, плазуни, птахи, ссавці.*

Introduction

The study of the organization of artificial systems at the level of individual biological complexes is necessary to understand their balanced functioning in conditions of constant anthropogenic transformation of the natural environment. This is importance in connection with the currently relevant problems of biodiversity conservation and the need to improve the assessment of the impact of anthropogenic factors on natural ecosystems. Natural ecosystems of the Cherkasy region have undergone significant transformations over the past 70 years of their existence. Landscapes have become more anthropogenic. Nowadays, the issue of urbanization problems arises, cities grow by absorbing settlements, thereby forming megacities. Animals are an important component of any biogeocenosis, including anthropogenically created environments. All species of animals that live in urban environments are part of it and, through complex relationships, form a mosaic of biogeocenoses. Parks of cities and settlements are not only recreational areas, but also a place of habitat for various species of animals, thereby acting as centers of biodiversity in an urban environment. The plantings of the «Peremohy» Park include a collection of approximately 60 species of woody and shrubby plants. There are also artificial lakes and elevations (Свояк та Фоміна, 2012). The Cherkasy City Zoological Park is an integral compositional element of the «Peremohy» Park, thereby emphasizing its multifunctionality. We emphasize that both objects, which complement each other, have a completely artificial basis, both in terms of woody vegetation and the relief of the area with all water bodies, which were also created artificially. Previously, no targeted studies of the vertebrate fauna of the park were conducted, but there are materials that relate to the ornithology of this park in combination with the systems of the urban environment of the city of Cherkasy (Гаврилюк, 1996). It is believed that the park elements of the urban environment are one of the richest in species of green zones of the city. But the relationship of flora-fauna in these conditions is recommended to be considered with caution due to the significant proportion of plants that are considered decorative (Nielsen et al., 2013).

The purpose of the research was to establish the species composition (by collecting materials) and ecological features of vertebrate species within the «Peremohy» Park in the city of Cherkasy, as well as to consider their possible ways of adaptation to the urban habitat.

To achieve the purpose of the research, the following tasks were set:

- to investigate the species composition of wild vertebrate species;
- to identify the presence of alien species;
- to identify wild vertebrate species that have a protected status;
- identify factors that negatively impact on the vertebrates of the park's fauna.

Material and methods

«Peremohy» Park is a park-monument of landscape art of local importance in the city of Cherkasy, located in the southwestern part of the city and it is a total area 23 hectares (Fig. 1). It was created artificially as a multifunctional city park, since it has both a landscape and a memorial part.

Studies of wild vertebrate fauna of the Cherkasy city park "Peremohy" (Cherkasy city) were conducted from 2018 to 2022.

*Amphibians and reptiles***.** Depending on the ecological characteristics of the species, surveys of different groups of animals are conducted differently. For amphibians, surveys were conducted mainly in the spring, when they are concentrated in water bodies during the breeding season. In the summer-autumn period, lifestyle was taken into account. For terrestrial forms – on land, for terrestrial-aquatic – along the coastline (Писанець, 2007). Reptiles were counted during routes on land and along the coastline of water bodies (snakes and turtles).

*Birds***.** Studies of avifauna were conducted by route surveys using generally accepted methods (Скільський, 2002). Comprehensive work on the description of avifauna, including landscape-genetic complexes, was carried out using methods known to us and proven (Чаплигіна, 2010). Bird counts were conducted throughout the year from 2018 to 2022.

*Mammals***.** The methods for studying various groups of mammals were based on route counts and observations, covering the entire territory of the Peremohy park and the Cherkasy City Zoological Park as its component part. In winter, the count was carried out using traces on the snow cover (Ружіленко, 2002). Small rodents-dung beetles and other burrowing animals were studied based on the study of the found corpses of these animals. Bats were studied using two methods: remote and contact. As a remote method, the Pettersson D200 ultrasonic detector was used to conduct route-point observations and determine the places of the most concentrated bat activity in the studied area. All photographs posted in the publication are original author's, taken in the park. During the conducted research, the norms of biological ethics in relation to the animal population were observed.

Results

Within the studied sites, we identified 77 species of wild vertebrates belonging to 16 orders. These include amphibians, reptiles, birds, and mammals (Fig. 2).

Fig. 1. Location of the research site (park «Peremohy» in the city of Cherkasy, Cherkasy region)

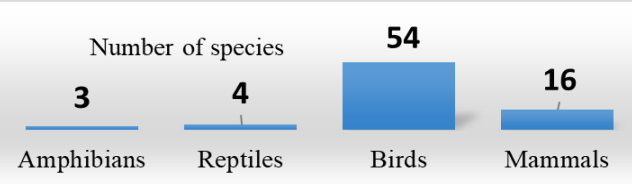

Fig. 2. Taxonomic diversity of vertebrates that make up the fauna of the Cherkasy city park "Peremohy"

Amphibians and Reptiles. There are only seven species – three species of amphibians and four species of reptiles (table 1). These are the least numerous systematic groups at the studied sites – 9.2% of the total species composition of wild vertebrates. Among amphibians, there are a small number of frogs: lake frog (*P. ribibunda*) and pond frog (*P. lessonae*), which are the least numerous and are found exclusively in the system of reservoirs of the "Peremohy" park.

The green toad (*B. virids*) is a terrestrial form, found both in the territory of the "Peremohy" park and in the territory of the zoo. Here it is a common species (fig. 3). In its distribution, this species is associated with steppe habitats, it mainly inhabits open areas: clearings, glades, meadows, arable land. Considering the genesis of the studied area, before the park and zoo were founded, there was a field with grassy vegetation and single trees in this area. In our opinion, this is the first feature that allows this species to live here. The second feature of *B. virids* is considered to be a significant tendency to synanthropy, that is, when this species is common in different types of settlements.

Among reptiles, a fairly numerous native species is the pond turtle (*E. orbicularis*). It is found in large numbers on the zoo's lake, mainly due to artificial settlement. In the territory of the "Peremohy" Park, single individuals are found annually throughout the entire period of activity. A fairly aggressive invasive introduced species is the red-eared slider turtle (*Trachemys scripta elegans*), which is released by local residents into water bodies. From 1989 to 1997, commercial farms in the United States exported 52 million animals to Europe for sale (Scalera, 2015). At this stage, there are known facts of competition with the local native species – *E. orbicularis*, which is considered vulnerable. And in New Zealand and Australia, where this species was introduced in the 90s, it is officially considered a pest, as it displaces native and endemic species and, in some way, affects the state of the local ichthyofauna (Scalera, 2015). In the conditions of the Central Forest-Steppe of Ukraine, it feels quite well in local reservoirs, and even successfully survives the winter, which is also associated with the appropriate microclimate of reservoirs. There have been no cases of reproduction of this species in Ukraine yet. On

Table 1

Ecological and faunistic analysis of the batrachian-herpetal complex of the Cherkasy city park "Peremohy" (Cherkasy city)

№	The name of the species on Lat.	Species name on Engl.	Conservation categories	Ecological group
Amphibia (Amphibia)				
Tailless amphibians (Anura)				
1	*Pelophylax ribibunda* (Pallas, 1771)	Lake frog	Bk III	Semi-aquatic
2	*Pelophylax lessonae* (Camerano, 1882)	Pond frog	Bk III	Semi-aquatic
3	*Bufo virids* (Linnaeus, 1758)	Green toad	Bk III	Ground-surface
Reptiles (Reptilia)				
Turtle Row (Testudines)				
1	*Emys orbicularis* (Linnaeus, 1758)	Marsh turtle	Bk II, МСОП.	Semi-aquatic
2	*Trachemys scripta elegans* (Wied-Neuwied, 1839)	Red-eared slider turtle		Semi-aquatic
Lizard Row (Sauria)				
3	*Lacerta agilis* Linnaeus, 1758	Sand lizard	Bk II	Ground (running)
Snake Row (Serpentens)				
4	*Natrix natrix* (Linnaeus, 1758)	Common snake	Bk III	Semi-aquatic

Notes to the table: IUCN – International Union for Conservation of Nature Red List; Bk – Berne Convention for the Protection of Literary and Artistic Works (Appendix I, Appendix II, Appendix III to the Convention).

A B

Fig. 3. A) Green toad (*B. virids*) (Cherkasy Zoo – near the ungulate row: 11.04.2019); B) Typical habitat

the territory of the zoo, it freely lives in a pond together with *E. orbicularis*. Among other species of reptiles, *L. agilis* and *N. natrix* are found, as fairly common and not numerous species. For *N. natrix*, typical habitats are near-water areas. *L. agilis* was noted in the Eastern part of the zoological park, and in open areas of the "Peremohy" park, which in this case is typical for this species, again, taking into account the genesis of the local relief and the location of the studied area near the field. It is known that *L. agilis* is attracted to natural habitats of open type and anthropogenic origin.

Birds. As of 2018–2022 years, 54 species of birds were counted in the territory of the studied objects – 71% of the entire complex of wild vertebrates of the local fauna. They constitute the most numerous systematic group (fig. 4., table 2).

There are species that nest in the park, as well as those that occur during flight or migration. As migratory birds, two species of herons are found (fig. 5).

The most numerous are the Passerine order – 67% of the total taxonomic composition of the bird complex. Among waterfowl, the mallard (*A. platyrhynchos*) is a permanent resident, which is found in the wild, both on the territory of the zoo and in the "Positions" park throughout the year. Among birds of prey, the well-known goshawk (*A. gentilis*) and the common kestrel *(F. tinnunculus*) are known. Among the known ecological groups of birds, the most numerous here is the dendrophilic – 69%, as the dominant one. The least numerous is the sclerophilous – 11%. Among the cavity-nesting birds, which account for 24% of the total noted bird complex, the most numerous taxonomic group is the woodpecker order – 46% (five species). The established distribution of bird diversity by 10 landscape-genetic faunal complexes showed that in the studied area the most widely represented birds are the European non-moral and ancient non-moral faunal complexes – 17% each. The smallest share is made up of representatives

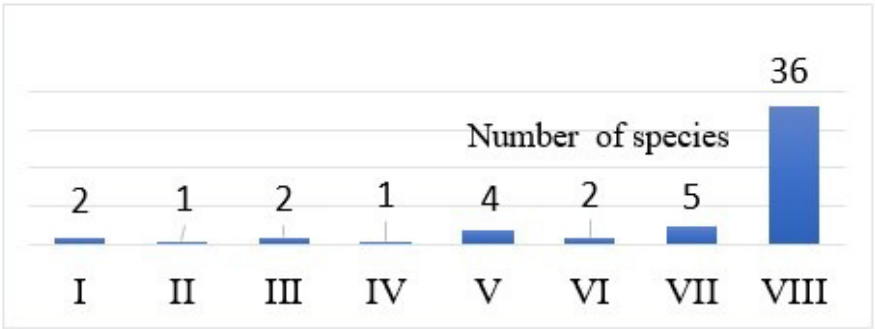

Fig. 4. Taxonomic composition of the wild bird complex of the Cherkasy city park "Peremohy":

Order: I – Ciconiformes (table 2, №1-2); II – Anseriformes (table 2, №2); III – Falconiformes (table 2, №4-5); IV – Gruiformes (table 2, №6); V – Columbioformes (table 2, №7-10); VI – Strigioformes (table 2, №11-12); VII – Pscioformes (table 2, №14-17); VIII – Passeriformes (table 2, №18-54).

A B

Fig. 5. Species of herons that are sometimes found on water bodies within the park and Cherkasy Zoo: A) *Ardea cinerea* (27.07.2018); B) *Ardea alba* (19.05.2018)

Table 2

Ecological and faunistic analysis of the avifauna of Cherkasy park "Peremohy"

№	Species name	Nature of stay	Faunal complex	Ecological group	Nesting type	Conservation categories
1	2	3	4	5	6	
1	*Ardea alba* Linnaeus, 1758	N,M,W,Om.	E	L	T	Bk(II);Bo(II)
2	*Ardea cinerea* Linnaeus, 1758	N,M,W,Om.	E	L	T	Bk(III)
3	*Anas platyrhynchos* Linnaeus, 1758	M,No,W.	E	L	HN,AS.	Bk(III);Bo(I)
4	*Accipiter gentilis* Linnaeus, 1758	No,M,S.	AN	D	T	Bk(II);Bo(I)
5	*Falco tinnunculus* Linnaeus, 1758	M,W,N.	TR	D	T, AS	Bk(II);Bo(II)
6	*Gallinula chloropus* Linnaeus, 1758	N,M,W,Nt.	E	L	HN	Bk(III)
7	*Columba palumbus* Linnaeus, 1758	N,M,W,Nt.	FS	D	T	-
8	*Columba livia* Gmelin, 1789	N,M,W,S.	DM	S	AS	Bk(III)
9	*Streptopelia decaocto* Frivaldszky, 1838	Nt,S.	TR	D	T	Bk(III)
10	*Streptopelia turtur* Latham, 1790	N,M,S.	FS	D	T	Bk(III)
11	*Asio otus* Linnaeus, 1758	No,S.	AF	D	T	Bk(II)
12	*Strix aluco* Linnaeus, 1758	S.	AN	D	TH, AS.	Bk(II)
13	*Jynx torquilla* Linnaeus, 1758	N,M.	AN	D	TH.	Bk(II)
14	*Picus canus* (Gmelin, 1788)	No,Nt,S.	AN	D	TH	Bk(II)
15	*Dendrocopos major* Linnaeus, 1758	S,No.	AN	D	TH	Bk(II)
16	*Dendrocopos syriacus* Hemprich & Ehrenberg, 1833	No,Nt,S.	AN	D	TH	Bk(II)
17	*Dryobates minor* Linnaeus, 1758	No,Nt,S.	AN	D	TH.	Bk(II)
18	*Hirundo rustica* Linnaeus, 1758	N,M.	DM	D	AS	Bk(II)
19	*Delichon urbicum* Linnaeus, 1758	N,M.	DM	S	AS	Bk(II)
20	*Galerida cristata* Linnaeus, 1758	No,S.	DS	C	HN	Bk(II)

Continuation of table 2

21	*Motacilla flava* Linnaeus, 1758	N,M.	BR	L	AS	Bk(II)
22	*Motacilla alba* Linnaeus, 1758	N,M.	BR	L	AS	Bk(II)
23	*Lanius collurio* Linnaeus, 1758	N,M.	FS	D	S	Bk(II)
25	*Oriolus oriolus* Linnaeus, 1758	N,M, Nt.	NM	D	T	Bk(II)
26	*Sturnus vulgaris* Linnaeus, 1758	M,Nt.	DM	D	TH.	-
27	*Garrulus glandarius* Linnaeus, 1758	No,Nt,S.	AN	D	T	-
28	*Pica pica* Linnaeus, 1758	Nt.,S.	AF	D	T	-
29	*Corvus monedula* Linnaeus, 1758	No,M, S.	DM	D	AS	-
30	*Corvus frugilegus* Linnaeus, 1758	Nt,S,No,W.	AF	D	T	-
31	*Corvus cornix* (Linnaeus,1758)	No,W,Nt, S.	FS	D	T	-
32	*Corvus corax* Linnaeus, 1758	No,S.	BR	D	T	Bk(III)
33	*Bombycilla garrulus* Linnaeus, 1758	S,No,M, W.	BR	D	T	Bk(II)
34	*Acrocephalus arundinaceus* Linnaeus, 1758	M, N, Nt.	E	L	GS.	Bk(II)
35	*Regulus regulus* Linnaeus, 1758)	W.	BR	S	T	-
36	*Ficedula hypoleuca* Pallas, 1764	M, N,Nt.	NM	D	TH.	Bk(II)
37	*Phoenicurus ochruros* Gmelin, 1774	M, N, Nt.	ПГ	S	AS	-
38	*Erithacus rubecula* Linnaeus, 1758	N, M, W.	NM	D	HN	Bk(II)
39	*Luscinia luscinia* Linnaeus, 1758	N, M.	NM	D	HN	Bk(II)
40	*Turdus pilaris* Linnaeus, 1758	N, M, W.	BR	D	T	Bk(II);Bo(I)
41	*Turdus merula* Linnaeus, 1758	N,M,W,Nt,S	NM	D	T	-
42	*Turdus philomelos* Brehm, 1831	N, M, Nt.	NM	D	T	-
43	*Turdus viscivorus* Linnaeus, 1758	N, M, W.	NM	D	T	Bk(II)
44	*Aegithalos caudatus* Linnaeus, 1758	No, S.	AN	D	T	Bk(III)
45	*Parus caeruleus* Linnaeus, 1758	No, M, Nt,S.	NM	D	TH	Bk(II)
46	*Parus major* Linnaeus, 1758.	No, M, Nt,S.	NM	D	TH	-
47	*Sitta europaea* Linnaeus, 1758	No, Nt, S.	AN	D	TH.	Bk(II)
48	*Certhia familiaris* Linnaeus, 1758	No, S.	AN	D	TH	Bk(II)
49	*Passer domesticus* Linnaeus, 1758	Nt, S.	DM	S	AS	-
50	*Passer montanus* Linnaeus, 1758	Nt, S.	DM	S	AS	-
51	*Fringilla coelebs* Linnaeus, 1758	N, M, W.	NM	D	T	Bk(III)
52	*Carduelis carduelis* Linnaeus, 1758)	N, M, W	FS	D	S	Bk(II)
53	*Acanthis cannabina* Linnaeus, 1758	N, M, W	FS	D	T	Bk(II)
54	*Coccothraustes coccothraustes* Linnaeus, 1758	S, No, M.	FS	D	T	Bk(II)

Notes to the table:

***Nature of stay**: Nt – nests in this territory, S – settled, M – migratory, W – wintering, Om – occurs on flights during migrations, N – nesting, No – nomadic, ? – unknown nature of stay in this territory; **Faunal complex**: NM – non-moral European complex; FS – forest-steppe European; SM – sub-Mediterranean, AN – ancient non-moral; AF – ancient forest-steppe complex; DS – desert-steppe; DM – desert-mountain; E– estuarine; TR – tropical; BR – boreal; **Ecological group**: D – dendrophiles, C – campophiles, L – limnophiles, S – sclerophytes; **Nesting type**: T – treetops, S – shrubs, GS – ground-shrub (build nests in ground vegetation at a height of up to 0.5 m); HN – ground-nesting; AS – anthropogenic structures; TH – tree hollow. **Conservation categories**: Bk – Berne Convention for the Protection of Literary and Artistic Works (Appendix I, Appendix II, Appendix III to the Convention); BO – Bonn Convention (Appendix I, Appendix II to the Convention).*

of the sub-Mediterranean and desert-steppe – 2% each (fig. 6).

Mammals. According to research, the faunal complex includes 16 species of mammals belonging to four systematic groups, which is approximately 20% of all vertebrate species of the local fauna. The most numerous of them so far is the Order of Bats (table 3). The background species among them is the red nightjar (*N. noctula*), which is quite common in the park and forms breeding colonies (fig. 7). Rare species are the genus *Plecotus* and the species *M. daubentonii*.

Among the predators, there is a weasel (*M. foina*), which was noted in the early second half of February (17.02.2019) in the farmyard near a row of birds of prey. All other species of predatory mammals, namely *M. nivalis* and *V. vulpes*, are known only from observations by zoo employees (personal data of A. Yu. Ladnov). M. nivalis paw prints were noted on 17.02.2019 on the snow cover in the southeastern part of the "Peremohy" park. Measurements were carried out according to the method (Ружіленко, 2002).

Among rodents, common species are the squirrel (*S. vulgaris*), house mouse *(M. musculus*). Sometimes, the field mouse *(A. agrarius*) is found on the territory of the zoo. Recently, it is known that this species is actively penetrating large cities, where it is most likely one of the most numerous species among mammals living in urbanized areas (Межжерін та Лашкова, 2013). On the territory of the zoo, it was noted in its central part (behind the enclosure with the tigress). *C. suaveolens* was noted in the southern part of the park (05.06.2022).

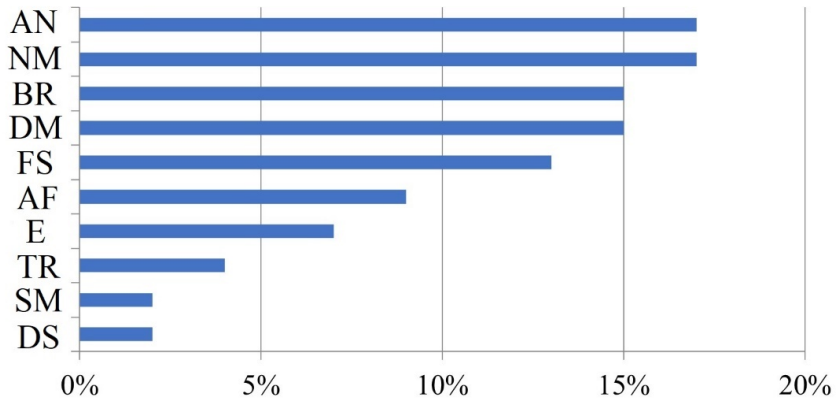

Fig. 6. Distribution of the avifauna of the "Peremohy" park by landscape-genetic faunal complexes: *NM – non-moral European complex; FS – forest-steppe European; SM – sub-Mediterranean, AN – ancient non-moral; AF – ancient forest-steppe complex; DS – desert-steppe; DM – desert-mountain; E– estuarine; TR – tropical; BR – boreal*

A B

Fig. 7. A) *N. noctula* and *E. serotinus* (10.04.2022); B) Typical habitat of the "Peremohy" park

Table 3

Ecological and faunal analysis of the theriocomplex of the Peremohy Park.

	Species name Lat.	**Species name Engl.**	**Conservation categories**	**Ecological group**
Ряд Комахоїдні (Insectivora)				
1	*Erinaceus europaeus* Linnaeus, 1758	European hedgehog		Terrestrial form
2	*Crocidura suaveolens* (Pallas, 1811)	Small white-toothed		Semi-underground form
Ряд Рукокрилі (Chiroptera)				
3	*Myotis daubentonii* (Kuhl, 1817)	Daubenton's bat	RBU; Bk II; BO (II)*	Flying form
4	*Plecotus sp.*	Long-ear bat	RBU; Bk II; BO (II)*	Flying form
5	*Nyctalus noctula* (Schreber, 1774)	Noctule bat	RBU; Bk II; BO (II)*	Flying form
5	*Pipistrellus nathusii* (Keyserling, Blasius, 1839)	Nathusius's Pipistrelle	RBU; Bk II; BO (II)*	Flying form
7	*P. pygmaeus* (Leach, 1825)	Soprano pipistrelle	RBU; Bk II; BO (II)*	Flying form
8	*P. kuhlii* (Kuhl, 1817)	Kuhl's pipistrelle	RBU; Bk II; BO (II)*	Flying form
9	*Vespertilio murinus* Linnaeus, 1758	Parti-coloured bat	RBU; Bk II; BO (II)*	Flying form
10	*Eptesicus serotinus* (Schreber, 1774)	Serotine bat	RBU; Bk II; BO (II)*	Flying form
Ряд Гризуни (Rodentia)				
11	*Sciurus vulgaris* Linnaeus, 1758	Eurasian red squirrel	Bk III	Dendrophil
12	*Mus musculus* Linnaeus, 1758	House mouse		Semi-underground form
13	*Apodemus agrarius* (Pallas, 1771)	Striped field mouse		Semi-underground form
Ряд Хижі (Carnivora)				
14	*Martes foina* (Linnaeus, 1758)	Stone Marten	Bk III	Terrestrial form
15	*Mustela nivalis* (Linnaeus, 1766)	Least weasel		Semi-aquatic form
16	*Vulpes vulpes* (Linnaeus, 1758)	Red fox		Semi-underground form

Notes to the table:

RBU – Red Book of Ukraine; Bk – Berne Convention for the Protection of Literary and Artistic Works (Appendix I, Appendix II, Appendix III to the Convention); Bo – Bonn Convention (Appendix I, Appendix II to the Convention).

Discussion

Considering the structure of the species composition of vertebrates in the Peremohy Park, a trend towards a small number of alien species for three systematic groups is observed, which is inextricably linked to anthropogenic impact (fig. 8). It remains unchanged for amphibians, which is quite characteristic of the local batrachian fauna, as well as the characteristic small number of species for the territory of Ukraine.

Approximately a quarter of the vertebrate species noted here have a protected status (fig. 9). Within the framework of the Bern Convention on the Conservation of Wild Flora and Fauna and their Natural Habitats, more than half – 70% (39 species) of birds within the studied area are of conservation interest

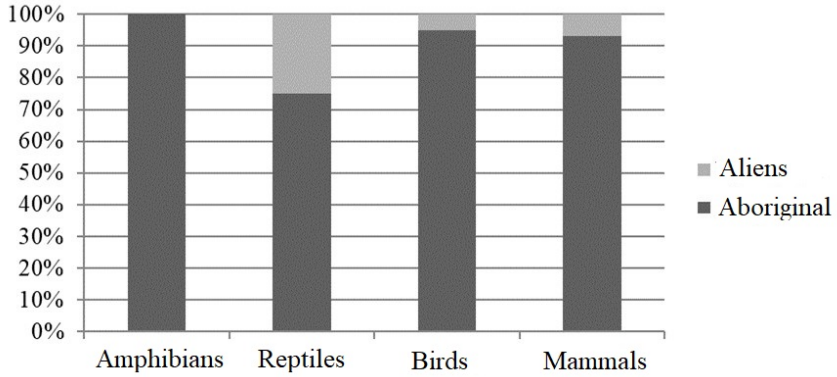

Fig. 8. Systematic structure of wild vertebrate fauna of Cherkasy City Zoological Park and "Peremohy" park by the ratio of native and alien species

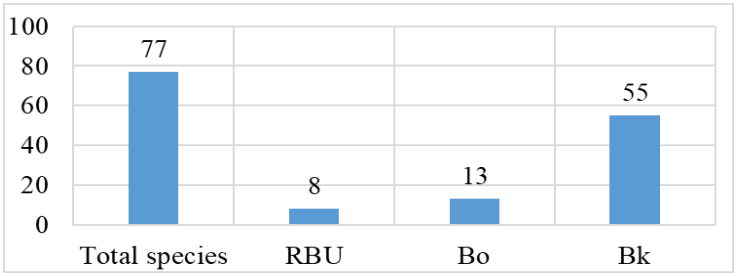

Fig. 9. Conservation status of wild vertebrates of the Cherkasy City Zoological Park and the "Peremohy" park of the tract: *RBU – Red Book of Ukraine; Bk – Berne Convention for the Protection of Literary and Artistic Works; Bo – Bonn Convention*

on a European scale (Годлевська та ін., 2010; Конвенція ..., 1979). Among mammals, the main group that is protected are bats.

This review demonstrates that parks are among the most species-rich places within urban systems. Birds are particularly well-studied here, as they are the most numerous taxonomic group among vertebrates. The results of the studies show that key ecological theories, namely the gradient approach and the island habitat theory, as well as the fundamental species-area topological relationships, are valid for urban parks, even without considering the urban landscape (Nielsen et al., 2013). Therefore, anthropogenic pressure (recreational load, creation of artificial habitats) can also have a positive effect on the species composition of the animal population of urban parks.

Conclusions

The conducted ecological and faunal analysis of wild vertebrates of the fauna of the city park "Peremohy" in Cherkasy allowed to establish:

- the presence of 77 species of wild vertebrates, including: amphibians – three species, reptiles – four species, birds – 54 species, and 16 species of mammals;
- the systematic structure showed the presence of alien species among reptiles, birds and mammals, which characterizes anthropogenically modified landscapes;
- the presence of eight species of wild vertebrates listed in the Red Book of Ukraine and 55 species under the auspices of the Bern Convention.

The main negative factor for the conservation of species in the park is anthropogenic impact. The work carried out shows that this impact (recreation, creation of artificial habitats) can also have a positive impact on the fauna. We should also not neglect the military operations, from which the southwestern district of the city suffered the most for a while.

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