

DIVERSITY AND ECOLOGICAL PECULIARITIES OF TERRESTRIAL VERTEBRATE FAUNA OF CHISINAU CITY, REPUBLIC OF MOLDOVA

SOCHIRCĂ Natalia, NISTREANU Victoria, BOGDEA Larisa, POSTOLACHI Vlad, LARION Alina, CARAMAN Natalia, CRUDU Vasile, CALDARI Vlad

Abstract. The studies were accomplished during the spring-winter period of 2012 in various types of ecosystems from Chișinău city and its surroundings. The mammal fauna of the city is rather rich, being registered 39 mammal species: 6 insectivore species, 9 bat species, 16 rodent species, 1 lagomorph species, 5 carnivorous species and 2 artiodactyl species. 117 bird species were registered on the territory of the city during all phenological periods. The domination degree of bird species decreases from cold period toward summer, reaching its minimum in nesting period, when bird distribution is more uniform. In post-breeding period and during autumn migration the dominance degree increases again, fact connected to the accumulation of some species in locks and their uneven distribution. Among reptiles 4 species were registered and among amphibians 9 species.

Keywords: urban ecosystems, terrestrial vertebrates, diversity, dominance, abundance.

Rezumat. Diversitatea și particularitățile ecologice ale faunei de vertebrate terestre din municipiul Chișinău, Republica Moldova. Cercetările au fost efectuate în perioada primăvară - iarnă a anului 2012 în diverse tipuri de ecosisteme ale orașului Chișinău. Fauna de mamifere este diversă, fiind înregistrate 39 de specii: 6 specii de insectivore, 9 specii de chiroptere, 16 specii de rozătoare, o specie de lagomorfe, 5 specii de carnivore și 2 specii de copitate. Pe parcursul tuturor perioadelor fenologice, pe teritoriul orașului au fost semnalate 117 specii de păsări. Gradul de dominanță al speciilor de păsări descrește din perioada rece către cea estivală și atinge valori minime în perioada cuibăritului, când distribuția păsărilor este mai uniformă. În perioada postreproductivă și în timpul migrațiilor de toamnă dominanța păsărilor scade din nou, datorită acumulării indivizilor în stoluri și distribuției lor neuniforme. Printre reptile au fost identificate 4 specii, iar printre amfibieni 9 specii.

Cuvinte cheie: ecosisteme urbane, vertebrate terestre, diversitate, dominanță, abundență.

INTRODUCTION

At present the processes of anthropization and degradation of natural ecosystems occur intensely throughout the country. In the last decades a high growth of urban areas and, consequently, an increase in urban population density has been registered. From evolutionary aspect the cities represent new type of biota, with a complex of permanently changing ecological conditions. The city area and the adjacent territories subject to disturbances are constantly expanding. In such conditions modifications of faunistic community structure occur and the animal species gradually adapt to new conditions.

The terrestrial vertebrate fauna is an indispensable component of the urban environment, having a huge importance in the maintenance and functioning of the ecosystems strongly affected by anthropogenic activity. At the same time the vertebrate species can serve as ecological indicators of the ecosystem stability and of the urban coenoses status. There are only few studies concerning urban fauna in the past century (ANISIMOV, 1966; ANISIMOV & COJUHARI, 1978). In the last years the study of Chișinău vertebrate fauna was more intense (BOGDEA et al., 2008; NISTREANU & CARAMAN, 2009; NISTREANU et al., 2011; VASIȚĂȘCU & MUNTEANU, 2008; VASIȚĂȘCU, 2008; TIKHONOV et al., 2009, 2010; TIKHONOVA et al., 2012, etc.). Still, there are no complex studies on diversity and ecology of terrestrial vertebrate species from Chișinău city and its surroundings. Therefore, the aim of this study was to check the diversity of terrestrial vertebrate species of Chișinău city and to emphasize some ecological peculiarities of the studied groups.

MATERIALS AND METHODS

The studies were accomplished during the spring-winter period of 2012 in various types of ecosystems from Chișinău city and its surroundings. The parks are represented by city parks: La Izvor, Valea Trandafirilor, Dendrarium, Ștefan cel Mare and Botanical Garden. The forest ecosystems are represented by forest plantations and remains of natural woods around the city (Durești, Dănceni, Băcioi, Suruceni, Sociteni, Vadul-lui-Voda). The open land ecosystems are represented by various types of cultivated lands (orchards, vineyards, cereals, alfalfa), fallow grounds, grasslands, pastures and rocky biotopes, including caves and stone quarries (Criuleni). The wet biotopes are represented by river banks, swamp sectors, lakes and ponds. Various types of buildings were also considered: houses, industrial deposits, tall buildings with adjacent territories, usually grown with tree and shrub vegetation.

The used methods were the direct observations during several days each month (March-October), collecting and determination of trophic remains, catching with traps (small mammals) and with nets (passerine birds). The large and medium-sized mammals, the birds, the reptiles and amphibians were counted during routes within a certain area; the route length varied from 1 to 10 km. The ecological analysis of vertebrate communities was based on the following parameters:

frequency, abundance, diversity (Shannon and Simpson indexes), Sorensen coefficient. In order to determine the influence degree of biotic and abiotic factors upon terrestrial vertebrate fauna, the factorial analysis was applied.

The statistical analysis was performed using the programs Statistics Workbook, Microsoft Excel, BiodiversityPro. In our studies the following equipment was used: binoculars, telescope, laser rangefinder, night vision monocular, GPS E-Trex-10, digital cameras Nikon and Panasonic, digital video camera, dictaphone, ultrasonic detector D-230, snap traps, live traps.

RESULTS AND DISCUSSIONS

The mammal fauna of Chişinău city and its surroundings is rather rich, being registered 39 species. There were recorded 6 insectivore species, 9 bat species, 16 rodent species, 1 lagomorph species, 5 carnivorous species and 2 artiodactyl species (Table 1).

Table 1. Mammal species registered in the urban ecosystems of Chişinău city and surroundings.

No.	Species	Ecosystems								
		Forest	Shelter belts	Parks	Wet biotopes	Orchards and vineyards	Cereals	Fallow ground	Rocky	Buildings
1	<i>Erinaceus concolor</i>	+	+	+	+	+	+	+	+	+
2	<i>Talpa europaea</i>	+	+	+	-	+	+	+	-	-
3	<i>Sorex araneus</i>	+	+	+	+	+	-	+	-	-
4	<i>Sorex minutus</i>	+	+	-	+	+	-	-	-	-
5	<i>Crocidura leucodon</i>	+	+	-	+	+	-	+	+	-
6	<i>Crocidura suaveolens</i>	+	+	+	+	+	+	+	+	+
7	<i>Myotis daubentonii</i>	+	-	+	+	+	-	-	+	-
8	<i>Myotis dasycneme</i>	+	-	-	+	-	-	-	+	-
9	<i>Myotis mustacinus</i>	+	-	-	+	-	-	-	+	-
10	<i>Myotis bechsteinii</i>	+	-	-	+	-	-	-	+	-
11	<i>Myotis blythii</i>	-	+	+	-	+	-	-	+	+
12	<i>Eptesicus serotinus</i>	+	-	+	-	+	-	+	+	-
13	<i>Plecotusaurus triacus</i>	-	+	+	-	+	-	-	+	+
14	<i>Plecotusaurus auritus</i>	+	+	+	-	+	-	-	+	+
15	<i>Pipistrellus pipistrellus</i>	+	+	+	-	+	-	-	+	+
16	<i>Sciurus vulgaris</i>	+	+	+	-	+	-	-	-	+
17	<i>Dryomys nitedula</i>	+	+	+	-	+	-	-	-	-
18	<i>Muscardinus avellanarius</i>	+	+	+	-	+	-	-	-	-
19	<i>Nannospalax leucodon</i>	-	+	-	-	+	+	+	-	-
20	<i>Ondatra zibethicus</i>	+	-	+	+	-	-	-	-	-
21	<i>Arvicola terrestris</i>	-	-	-	+	-	-	-	-	-
22	<i>Rattus norvegicus</i>	-	-	+	+	+	+	+	-	+
23	<i>Mus musculus</i>	-	+	+	+	+	+	+	+	+
24	<i>Mus spicilegus</i>	-	-	-	-	+	+	+	-	-
25	<i>Apodemus sylvaticus</i>	+	+	+	+	+	+	+	+	-
26	<i>Apodemus uralensis</i>	+	+	-	-	+	+	+	-	-
27	<i>Apodemus flavicollis</i>	+	+	+	-	+	+	+	-	-
28	<i>Apodemus agrarius</i>	+	+	-	+	+	+	+	-	-
29	<i>Microtus sp.</i>	-	+	-	+	+	+	+	+	-
30	<i>Clethrionomys glareolus</i>	+	+	+	-	+	-	-	-	-
31	<i>Pitymys subterraneus</i>	+	-	-	-	-	-	-	-	-
32	<i>Lepus europaeus</i>	+	+	-	-	+	+	+	-	-
33	<i>Vulpes vulpes</i>	+	+	-	-	+	-	+	+	-
34	<i>Meles meles</i>	+	-	-	-	-	-	-	-	-
35	<i>Mustela nivalis</i>	+	+	-	-	+	-	+	+	-
36	<i>Mustela putorius</i>	+	+	-	-	+	-	-	-	+
37	<i>Martes foina</i>	+	-	-	-	-	-	-	+	-
38	<i>Capreolus capreolus</i>	+	-	-	-	-	-	-	-	-
39	<i>Sus scrofa</i>	+	-	-	-	-	-	-	-	-

The forest ecosystems have rich and abundant fauna. There were registered all insectivorous, carnivorous and artiodactyl species, as well as the majority of bat and rodent species. The shelter belts also provide favourable conditions for the majority of insectivore, bat, rodent and carnivore species. In city parks the fauna is represented by the most spread insectivore and rodent species and by several bat species.

Among agricultural ecosystems the richest fauna was registered in orchards, where open-land species, forest species and some carnivorous mammals can find favourable conditions. The wet biotopes are suitable for hygrophilous insectivore, bat and rodent species. In rocky biotopes all bat species, some insectivore, carnivore and only few rodent species were recorded. The lowest number of species was registered in buildings and adjacent territories: hedgehog, squirrel, lesser shrew – the most anthropophilous species among shrews, some bat species hibernating inside the buildings, in attics, the polecat – find shelter in attics of private houses, where it feed on small rodents, birds, chicken, and a high number of house mouse and rats, strongly connected to anthropogenic environment.

The small mammal communities from city ecosystems were subjected to more deep study, being evaluated their ecological features. The distribution according the biotopes of small mammal species within city limits, it can be seen that the most suitable for small mammal fauna are the biotopes similar to natural ones: forests, shelter belts and landscape parks situated at city limits, as well as various types of agrocoenoses (Fig. 1). The biotopes situated closer to city centre have rather low diversity and the small mammal fauna is represented by several most eurytopic and widespread rodent species. The diversity of small mammals is rather high; the Shannon index varies between 0.99 and 1.77, being the highest in shelter belts and the lowest – in grasslands (Fig. 1). The dominant species are those from genus *Apodemus* in the majority of studied biotopes, in wet forest *Clethrionomys glareolus* (50%) is dominant and in cereal crops – *Mus spicilegus* (61%) with more than half of all caught rodents. The shrew species were found in wet biotopes, in forest ecosystems, at forest edge and in grasslands. In forest and paludous ecosystems the dominant species is *Sorex araneus*, while in open lands *Crocidura suaveolens* is dominant.

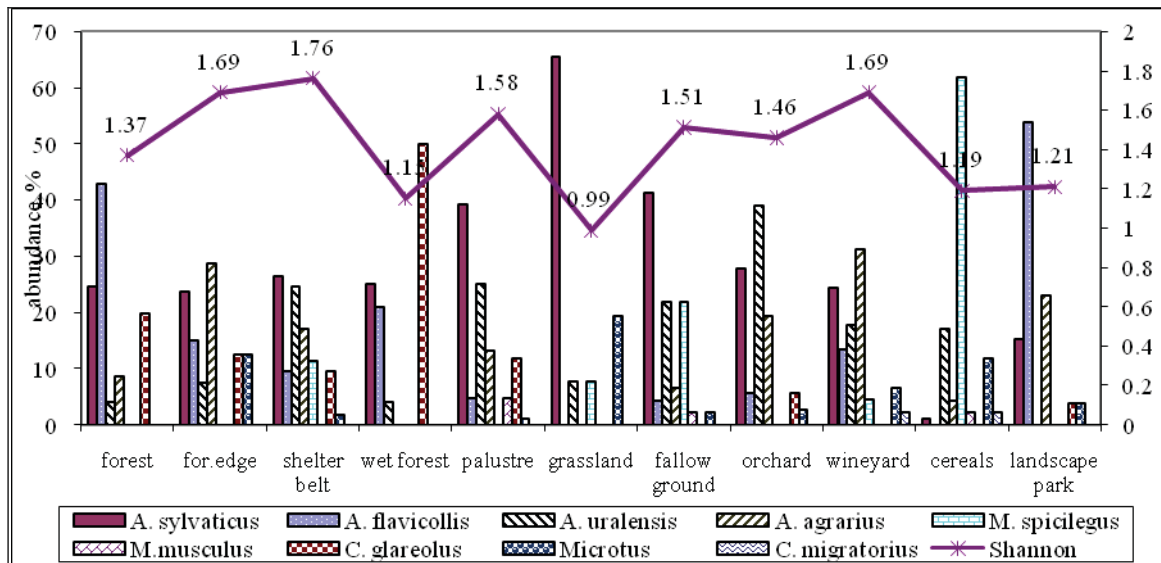


Figure 1. Abundance and diversity of rodent species in the ecosystems of Chișinău city.

Bird populations. The observation on bird populations in the studied ecosystems city allow to emphasize their distribution and density peculiarities in various types of biotopes within Chișinău city and adjacent territories. On the whole, 117 bird species were registered on the territory of the city during all phenological periods (Table 1). Some features of bird communities were emphasized, such as frequency, phenological category within Chișinău city compared to the whole country. Among phenological categories the most representative is the SV one (summer visitors), with 47% in the republic and 38.4% in Chișinău city. For some bird species the urban habitats serve as rest sites (12.8%) and in winter period these biotopes provide favourable conditions for 13.6% of bird species.

The most abundant and diverse avifauna lives in the green areas of the city. Thus, 73 species were registered in the park "La Izvor", 62 species in the Botanical Garden, and the lowest species number (16 species) – in central public Garden "Ștefan cel Mare" (BOGDEA et al., 2008; VASIŁAȘCU, 2008). This situation is caused by its location in the city centre, low surface, high degree of disturbance, poor vegetation structure, absence of paludous biotopes. Therefore, according to its birdfauna diversity, the public Garden "Ștefan cel Mare" is more similar to residential neighbourhoods than to other investigated parks. The comparative study of bird communities in various biotopes shows that at city outskirts can be met many species that are not observed in the central part – *Corvus corax*, *C. monedula*, *Jynx torquilla*, *Luscinia luscinia*, *Lanius collurio*, *Saxicola torquata*, etc. (VASIŁAȘCU & MUNTEANU, 2008). Birds are more often attracted by forest plantations merging with urban parks such as forest with a relatively high surface and larger variety of biotopes.

Table 2. Bird species recorded in Chișinău city ecosystems.

No.	Species	Species frequency				Phenology	
		A	R	F	FF	Chișinău city	R. Moldova
1	<i>Podiceps cristatus</i>	+				P	SV
2	<i>Ciconia ciconia</i>		+			P	SV
3	<i>Ardea cinerea</i>		+			P	SV
4	<i>Ixobrychus minutus</i>			+		SV	SV
5	<i>Nycticorax nycticorax</i>		+			P	SV
6	<i>Anas platyrhynchos</i>				+	PM	PM
7	<i>Aythya ferina</i>	+				P	SV
8	<i>Aythya fuligula</i>	+				WV	WV
9	<i>Larus ridibundus</i>			+		SV	PM

10	<i>Larus cachinnans</i>			+		PM	PM
12	<i>Accipiter nisus</i>			+		S	S
13	<i>Accipiter gentilis</i>			+		P	S
14	<i>Aquila pomarina</i>	+				SV	SV
15	<i>Milvus migrans</i>	+				SV	SV
16	<i>Circus aeruginosus</i>		+			SV	SV, RI
17	<i>Buteo buteo</i>		+			PM	PM
18	<i>Falco columbarius</i>		+			WV	WV
19	<i>Falco vespertinus</i>		+			P	SV
20	<i>Falco subbuteo</i>		+			P	SV
21	<i>Falco tinnunculus</i>			+		PM	PM
22	<i>Phasianus colchicus</i>			+		S	S
23	<i>Coturnix coturnix</i>		+			P	SV
24	<i>Perdix perdix</i>		+			S	S
25	<i>Gallinula chloropus</i>			+	+	SV	SV
26	<i>Fulica atra</i>				+	PM	PM
27	<i>Columba livia domestica</i>				+	S	S
28	<i>Columba palumbus</i>				+	SV	SV
29	<i>Streptopelia turtur</i>		+			P	SV
30	<i>Streptopelia decaocto</i>			+		S	S
31	<i>Cuculus canorus</i>			+		SV	SV
32	<i>Asio otus</i>			+		S	S
33	<i>Athene noctua</i>		+			SV	S
34	<i>Srix aluco</i>		+			S	S
35	<i>Scops otus</i>			+		S	S
36	<i>Apus apus</i>				+	SV	SV
37	<i>Alcedo atthis</i>			+		SV	SV
38	<i>Upupa epops</i>			+		SV	SV
39	<i>Dendrocopos syriacus</i>				+	S	S
40	<i>Dendrocopos major</i>				+	S	S
41	<i>Dendrocopos medius</i>		+			WV	S
42	<i>Dendrocopos minor</i>			+		S	S
43	<i>Dryocopus martius</i>	+				WV	S
44	<i>Picus camus</i>				+	S	S
45	<i>Jynx torquilla</i>			+		SV	SV
46	<i>Galerida cristata</i>				+	S	S
47	<i>Alauda arvensis</i>			+		SV	SV
49	<i>Hirundo rustica</i>				+	SV	SV
50	<i>Delichon urbica</i>				+	SV	SV
51	<i>Anthus trivialis</i>			+		SV	SV
52	<i>Anthus pratensis</i>			+		SV	SV
53	<i>Anthus campestris</i>			+		SV	SV
54	<i>Motacilla alba</i>				+	SV	SV
55	<i>Motacilla flava</i>			+		SV	SV
56	<i>Bombicilla garrulus</i>		+			WV	WV
57	<i>Lanius collurio</i>			+		SV	SV
58	<i>Lanius excubitor</i>	+				RWI	WV
59	<i>Oriolus oriolus</i>				+	SV	SV
60	<i>Sturnus vulgaris</i>				+	SV	PM
61	<i>Garrulus glandarius</i>				+	S	S
62	<i>Pica pica</i>				+	S	S
63	<i>Corvus monedula</i>			+		S	S
64	<i>Corvus frugilegus</i>				+	S	S
65	<i>Corvus corone cornix</i>				+	S	S
68	<i>Corvus corax</i>			+		S	S
70	<i>Troglodytes troglodytes</i>			+		WV	SV
71	<i>Acrocephalus arundinaceus</i>			+		SV	SV
72	<i>Acrocephalus scirpaceus</i>			+		SV	SV
73	<i>Sylvia atricapilla</i>			+		SV	SV
74	<i>Sylvia curruca</i>			+		SV	SV
75	<i>Sylvia borin</i>			+		SV	SV
76	<i>Sylvia communis</i>			+		SV	SV
77	<i>Phylloscopus collybita</i>				+	SV	SV
78	<i>Phylloscopus sibilatrix</i>			+		P	SV
79	<i>Phylloscopus trochilus</i>		+			P	SV
80	<i>Regulus regulus</i>			+		WV	PM
81	<i>Hippolais icterina</i>		+			SV	SV
82	<i>Muscicapa striata</i>			+		SV	SV
83	<i>Ficedula albicollis</i>				+	SV	SV
84	<i>Ficedula hypoleuca</i>		+			P	SV
85	<i>Ficedula parva</i>			+		SV	SV
86	<i>Phoenicurus phoenicurus</i>			+		SV	SV

87	<i>Phoenicurus ochruros</i>				+	SV	SV
88	<i>Saxicola rubetra</i>				+	SV	SV
89	<i>Saxicola torquata</i>				+	SV	SV
90	<i>Oenanthe oenanthe</i>				+	SV	SV
91	<i>Luscinia luscinia</i>				+	SV	SV
92	<i>Erithacus rubecula</i>					+	PM
93	<i>Turdus merula</i>					+	SV,PM
94	<i>Turdus philomelos</i>					+	SV
95	<i>Turdus pilaris</i>				+		WV
96	<i>Turdus iliacus</i>			+			WV
97	<i>Parus major</i>					+	S
98	<i>Parus caeruleus</i>					+	S
99	<i>Parus palustris</i>			+			S
100	<i>Aegialus caudatus</i>				+		WV
101	<i>Remiz pendulinus</i>				+		SV
102	<i>Sitta europaea</i>				+		S
103	<i>Certhia familiaris</i>				+		S
104	<i>Passer domesticus</i>					+	S
105	<i>Passer montanus</i>					+	S
106	<i>Fringilla coelebs</i>					+	PM
107	<i>Fringilla montifringilla</i>				+		WV
108	<i>Coccothraustes coccothraustes</i>					+	S
109	<i>Phyrrhula phyrrhula</i>				+		WV
110	<i>Loxia recurvirostra</i>		+				WV
111	<i>Emberiza citrinella</i>				+		S
112	<i>Emberiza calandra</i>				+		SV
113	<i>Emberiza schoeniclus</i>			+			WV
114	<i>Carduelis chloris</i>					+	S
115	<i>Carduelis carduelis</i>					+	S
116	<i>Carduelis cannabina</i>				+		S
117	<i>Carduelis spinus</i>				+		WV

Legend: A – accidental, R – rare, F – frequent, FF – very common; SV – summer visitor, WV – winter visitor, S – resident, PM – partial migrant, P – passage, RWV – rare winter visitor.

During a year the bird biotopic distribution is changing. The domination degree of bird species decreases from the cold period toward summer, reaching its minimum in the nesting period, when bird distribution is more uniform. In post-breeding period and during autumn migration the dominance degree increases again, a fact connected to the accumulation of some species in flocks and their uneven distribution. In built zones a similar aspect of bird distribution is observed as in green areas, but with a distance between limit values. Here, the species diversity in prevernal period is minimal $SI = 3.66$, then increases to $SI = 5.99$ in serotinal period and insignificantly decreases in autumn period. The dominance index (Soerenssen coefficient) in bird population from building zones is characterized by very high values, even higher than in green areas. Nevertheless, the index dynamics remain the same – the highest in spring ($Sc = 0.27$) and the lowest in post-breeding period ($Sc = 0.17$). This fact is due to differentiated bird biotopic distribution, conditioned by a different degree of their ecological capacity, by ethological peculiarities, especially of the synanthropic species.

The diversity analysis of bird species regarding the degree of habitat anthropization was performed according to MacArthur method (Fig. 3). This method proves that the species number and density (individuals/ha) vary depending on biotope conditions and on the influence of anthropogenic factors.

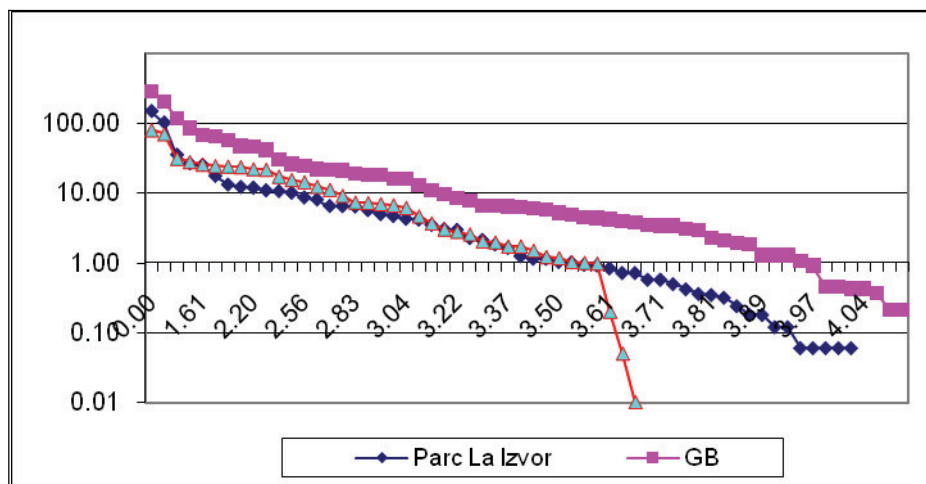


Figure 2. Comparative analysis of bird community diversity in natural, recreational and urban ecosystems (GB – Botanical Garden).

The species number and density is rather constant, but the natural biotopes can maintain a higher species density, due to homogeneous phytocenotic structure. The species number is higher in the forest park “La Izvor”, decreases in the Botanical Garden, in the forest belt “Ghidighici” and is the lowest in the shelter belt near Chetrosu locality.

Depending on preferences to different breeding sites the bird species registered within the studied ecosystems during nesting period were assigned to the following ecological groups:

- tree species breed in tree crown;
- shrub species breed on low height and build their nests in bushes or on undergrowth;
- soil species breed on soil surface, in galleries, or beside tree trunks;
- cavity species have a high plasticity, can breed on poles, in pipes, under house roof;
- building species connected to human localities and build their nests on buildings;
- hollow species nest in tree hollows. Some species are not able to build hollows themselves and use the existent ones;
- paludous species connected with water biotopes, breed in reedbeds.

Table 3. Bird distribution by ecological groups in breeding period (ind./km²).

Studied sector	Bird ecological groups according to nesting places						
	Tree	Shrub	Soil	Cavities	Buildings	Hollow	Reed
Park “La Izvor”	123.5	51.2	105	293	18.8	206	31.0
Park “Ștefan cel Mare”	140.00	30.00	40.00	580.00	80.00	100.00	0
5 floor buildings	85.76	19.6	0	437.50	49.09	76.47	0
Shelter belt	1252	841	180.0	-	-	312	-

The highest bird density was recorded in the species nesting in tree crowns (1.252 individuals/km²) from shelterbelts. The highest density of birds nesting in cavities and hollows was registered in the public garden “Ștefan cel Mare”, a situation that can be explained by the high number of hollow trees, lampposts, columns, poles and trays that provide suitable nesting places. The lowest value of this index (19.6 individuals/km²) was registered in a shrub group from the 5 floor building sectors, because of the general absence of shrub vegetation in these sectors.

The **amphibian and reptile fauna** in urban ecosystems of the city was studied during spring-autumn period. Thus, among reptiles 4 species were found, of which the pond turtle is a rare species, one snake and two lizard species (Table 4). The amphibian fauna is better represented, being registered 9 species, of which both newt species recorded on R. Moldova territory, 3 toad species, 3 frog species and the rare species common spadefoot (Table 4).

This rather high diversity of herpetofauna is due to the green sectors of the city, with relatively large surface, including the recreational parks Valea Morilor, Valea Trandafirilor, La Izvor, Valea Rîșcanilor, Dendrarium and the Botanical Garden, which provide favourable shelter and reproductive conditions for most of the reptiles and, especially, amphibian species. The amphibian tadpoles were found in the water basins from the above mentioned green areas of the city, on various stages of development.

Table 4. Spreading of herpetofauna species within the limits of Chișinău city.

Family	Species	Ecosystems				
		Forest	Green sectors	Paludous	Open biotopes	Buildings
Emydidae	<i>Emys orbicularis</i>	-	-	+	-	-
Lacertidae	<i>Lacerta agilis</i>	+	+	-	+	-
	<i>Lacerta viridis</i>	+	+	-	+	-
Colubridae	<i>Natrix natrix</i>	+	+	+	+	+
Salamandridae	<i>Triturus vulgaris</i>	+	-	+	-	-
	<i>Triturus cristatus</i>	+	-	+	-	-
Discoglossidae	<i>Bombina bombina</i>	-	-	+	-	-
Pelobatidae	<i>Pelobates fuscus</i>	-	+	+	-	+
Bufonidae	<i>Bufo bufo</i>	-	+	+	-	-
	<i>Bufo viridis</i>	-	+	+	+	+
Hylidae	<i>Hyla arborea</i>	+	+	+	-	+
Ranidae	<i>Rana esculenta</i>	-	-	+	+	-
	<i>Rana ridibunda</i>	-	-	+	+	-

The snakes are represented by one species – the grass snake *Natrix natrix*, which is common in all studied ecosystems. It is rather often met in Byc river meadow, which can be considered as the spreading ecological corridor for herpetofauna on the territory of the city. The lowest diversity was registered in the sectors with buildings, where only the green toad can survive, mostly due to its nocturnal way of life. The industrial zone as well as the small green squares does not provide any favourable conditions for herpetofauna existence.

The terrestrial vertebrate fauna in urban ecosystems of Chișinău city has a huge importance. It was grouped in the following categories: economically important species (115), among which regulatory species (98), game species (12) and invasive species (5).

CONCLUSIONS

The urban fauna of Chișinău city and its surroundings consists of 39 mammal species, 117 bird species, 4 reptile species and 9 amphibian species, among which 4 species are included in the Red Book of Moldova and 7 are rare species. The mammal fauna of the city is rather rich, being registered species from the orders Insectivora (6 species), Chiroptera (9 species), Rodentia (16 species), Lagomorpha (1 species), Carnivora (5 species) and Artiodactyla (2 species).

The most suitable biotopes for small mammal fauna are those areas which are similar to natural ones: forests, shelter belts and landscape parks situated at city limits, as well as various types of agrocoenosis. The diversity index of small mammal communities in various types of ecosystems is rather high and varies from 0.99 in grasslands and 1.77 in shelter belts.

Among bird species phenological categories the most representative is the Summer guest group with 47% in the republic and 38.4% in Chișinău city. The domination degree of bird species decreases from the cold period toward summer, reaching its minimum in the nesting period, when bird distribution is more uniform. In post-breeding period and during autumn migration the dominance degree increases again, a fact connected to the accumulation of some species in flocks and their uneven distribution. The dominance index in building zone is higher than in green sectors, being the highest in spring (0.27) and the lowest in post-breeding period (0.17), which show the differentiated biotopic distribution of birds within the city.

The rather high diversity of herpetofauna is due to the green sectors of the city, with relatively large surface, which provide favourable shelter and reproductive conditions for most of the reptile and, especially, amphibian species. The lowest diversity was registered in the sectors with buildings, while the industrial zone, as well as small green squares do not provide any favourable conditions for herpetofauna existence.

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Sochircă Natalia

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.
E-mail: nataliasochirca@rambler.ru

Nistoreanu Victoria

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.
E-mail: vicnistreanu@gmail.com

Bogdea Larisa

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.
E-mail: larius421@gmail.com

Postolachi Vlad

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.
E-mail: vpostolachi@rambler.ru

Larion Alina

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.
E-mail: larion_alina@yahoo.com

Caraman Natalia

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.
E-mail: cnatusea@yahoo.com

Crudu Vasile

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.

Caldari Vlad

Institute of Zoology, Academy of Sciences of Moldova,
Academy Str., 1, Chișinău.

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