

Aspects of bird diversity and ecology in "Rîșcani" forest park, Chisinau municipality

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Abstract. Our study has been focused on the diversity and ecology of birds in the "Rîșcani" forest park, Chisinau municipality. The scientific investigations were conducted between April and August 2022. We inventoried 52 species of birds with uneven distribution in the territory included in this study. The greatest diversity was found in forest areas subjected less to the anthropogenic impact. Vegetation management practices applied in the park and the expansion of recreational areas are disruptive factors for bird species, especially for their breeding population. Of the avifauna of the area, 50 species, or 96,2% of identified birds are included in the lists of the International Union for Conservation of Nature (IUCN), and 44 species, or 84,6%, are also included in the lists of the Bern Convention.

Keywords: avifauna, biodiversity, ecology, anthroposystem.

Aspecte privind diversitatea și ecologia păsărilor din parcul-pădure „Rîșcani”, mun. Chișinău

Rezumat. Studiul nostru se referă la diversitatea și ecologia păsărilor din cadrul parcului-pădure „Rîșcani”, mun. Chișinău. Investigațiile au fost realizate în perioada aprilie-august 2022. Am inventariat 52 de specii de păsări cu distribuție inegală în teritoriul inclus în acest studiu. Cea mai mare diversitate a fost întâlnită în spațiile forestiere cu presiune antropică mai redusă. Practicile de întreținere a vegetației în cadrul parcului și extinderea zonelor de agrement prezintă un factor perturbator pentru speciile de păsări, în special, asupra populației lor de reproducție. Din ornitofauna zonei 50 de specii sau 96,2% de păsări identificate sunt incluse în listele Iniunii Internaționale pentru Conservarea Naturii (IUCN), 44 specii sau 84,6% din zonă se găsesc și în listele Convenției Berna.

Cuvinte cheie: ornitofauna, biodiversity, ecology, anthroposystem.

1. INTRODUCTION

Biodiversity in the Republic of Moldova is permanently threatened by human activities. Environmental pollution and climate change, fragmentation of habitats, illegal logging and the increase in the number of rare species are some of the factors that negatively

influence biodiversity in the territory. The biodiversity of anthropogenic landscapes in the republic is often richer in terms of number of species than in wild areas.

The presence and diversity of birds in anthropogenic ecosystems plays an important role, because having a very high plasticity to environmental changes, they provide us with information about environmental quality. The previous research conducted within the anthropogenic ecosystems of Chisinau municipality has revealed a tendency towards certain changes in the composition of the urban avifauna. In the last decades, new species of birds have been detected that have visited and are visiting or even managed to become common for the parks in the municipality of Chisinau. Thus, such new species as: *Tadorna tadorna*, *Gavia stelata*, *Tacybaptus ruficolis*, *Dryocopus martius* were found in the “Valea Trandafirilor” Park, *Aythya marila* was found in the “La Izvor” Park, the species *Turdus merula* has become a common species in several green spaces of the city; the populations of some species of birds found, such as: *Garrulus glandarius*, *Columba palumbus* [5], sporadically in urban parks, in recent years had considerably increased.

There are several studies on the bird fauna of Chisinau, carried out within the Institute of Zoology [3; 6; 7; 8]. Most of the studies on the urban avifauna of the municipality refer to the forest spaces in the parks “La Izvor”, “Valea Trandafirilor”, Botanical Garden and Dendrological Park. The avifauna of the “Rîșcani” forest park has been less studied. To study the diversity of birds in the research area, two itineraries were identified. The first includes the southern part of the park, which is about 2,5 km long. Within the given itinerary, the phytocenosis is represented by a natural, spontaneous forest, which is then gradually replaced by ornamental forms characteristic of parks. The relief is heavily uneven; there are many ravines, but also clearings with spontaneous forest vegetation. The second itinerary includes the meadow on the bank of the stream near the park, which, being dammed, forms two lakes.

The “Rîșcani” forest park was founded in 1970 on the basis of a forest massif, being located between two sectors of Chișinău, Ciocana and Rîșcani. The total area of the park is 32 hectares. The park is divided into two parts by Aleco Russo str., which crosses it. There are water bodies in both parts of the park. The vegetation of the park, under the influence of anthropogenic factors, has become poor in herbaceous forest plants, and the maple (*Acer platanoides*) predominates in the stands on the hills, the elm (*Ulmus glabra*, *U. pumila*) and the poplar (*Populus canescens*, *P. nigra*) is in the valley [4]. The vertebrate fauna within the park is represented by about 72 species. Among them, there are 7 species of amphibians, 3 species of reptiles, 52 species of birds and 10 species of mammals.

2. MATERIALS AND METHODS

The field survey was carried out between April and August 2022. The established transects were monitored twice a month using binoculars (Carl Zeiss 8x30) and guidelines to identify birds [1]. The list of avifauna observed in the "Rîșcani" forest park includes 52 species, most of which are typical forest species and are characterized by uneven distribution in the territory.

3. RESULTS AND DISCUSSIONS

The birds found in the researched area belong to 9 orders, the most numerous being the representatives of *Passeriformes* – 67,3% (35 species) (Fig. 1). The passerines detected in the area belong to 14 families: *Hirundinidae*, *Motacillidae*, *Laniidae*, *Oriolidae*, *Sturdiidae*, *Corvidae*, *Sylvidae*, *Turdidae*, *Paridae*, *Sittidae*, *Certhidae*, *Passeridae*, *Fringillidae* and *Emberizidae*. The most numerous are: *Turdidae* – 7 species, *Corvidae*, *Sylvidae* and *Fringillidae*, the other families are represented by 1 to 4 species. It is followed by

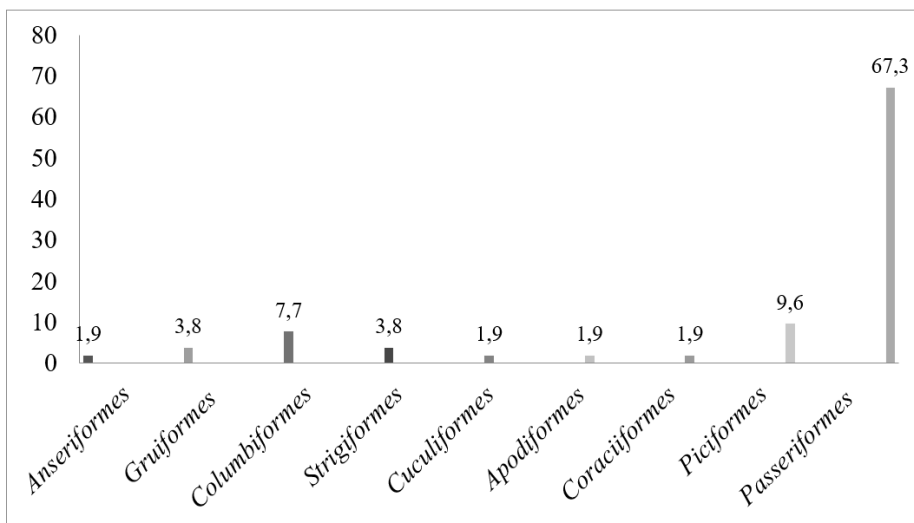


Figure 1. The taxonomic structure of the avifauna in the "Rîșcani" park.

the order *Piciformes* – 9,6% (5 species): *Dendrocopos syriacus*, *D. major*, *D. minor*, *Picus canus*, *Jynx torquilla*. Of the order *Columbiformes*, the following species were detected: *Columba livia domestica*, *C. palumbus*, *Streptopelia decaocto*, *S. turtur*. The representatives of *Gruiformes* and *Strigiformes* were *Gallinula chloropus*, *Fulica atra* and, respectively, *Asio otus* and *Otus scops*. The other orders are represented by the species *Anas platyrhynchos*, *Cuculus canorus* and *Apus apus*.

The habitat preferences of the avifauna of the park are quite varied: forest spaces and open spaces, areas with bushes and wetlands near water bodies, as well as spaces where various human-made constructions are present. Forest areas are home to 55.8% (29 species) of birds (Fig. 2). Next, the spaces with buildings follow. Here 10 species were

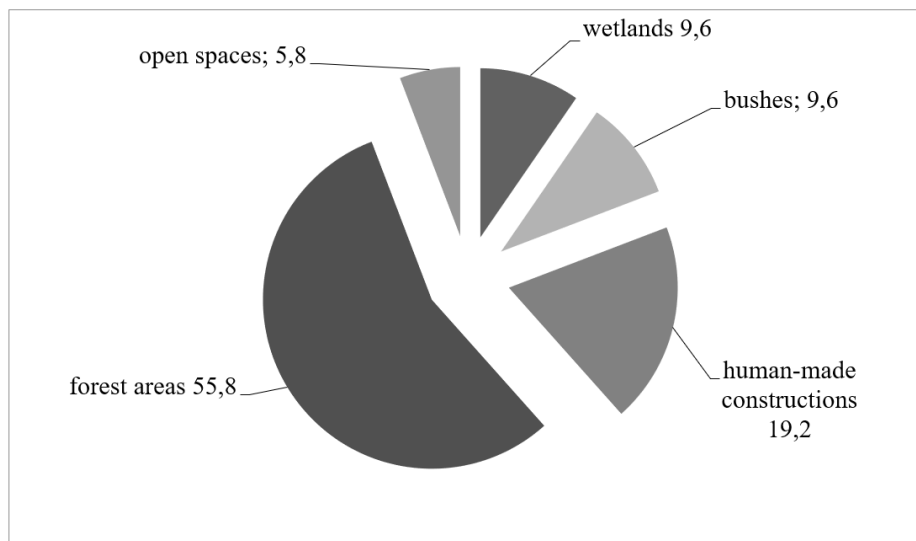


Figure 2. The habitat preferences of the avifauna in the “Rîșcani” park, %.

observed, or 19,2% of the total number of birds recorded within the park. The spaces of the park occupied by scrub, the wetlands – the water bodies and adjacent territories, as well as the open spaces within the park are less preferred by birds. Thus, by 5 species of birds were recorded in the scrub areas as well as in the water bodies and their adjacent territories, which represent by 9,6% each. In the open areas of the park, with stony soil and with sparse shrubby vegetation, only 3 bird species, or 5,8%, were recorded.

The preferences of the avifauna of the “Rîșcani” park over forest spaces and spaces with buildings can be explained by the fact that in the given areas birds have more opportunities to obtain food, build nests and ensure their safety, defence from enemies etc. Likewise, in forest areas, birds are less disturbed by people, who use the given park area for walks, rest, recreation etc.

According to nutritional preferences, most of the birds in the park are insectivores and omnivores (Fig. 3). Thus, there are 21 species of insectivores, or 40,4%, and 20 species of omnivores, or 38,5%. The nutritional spectrum of omnivorous birds represents a wide variety of food types: seeds, fruits, plant parts, insects, their larvae, gastropod molluscs, worms, earthworms and other invertebrates, and sometimes small vertebrates. Insectivorous birds usually eat only various insects and their larvae.

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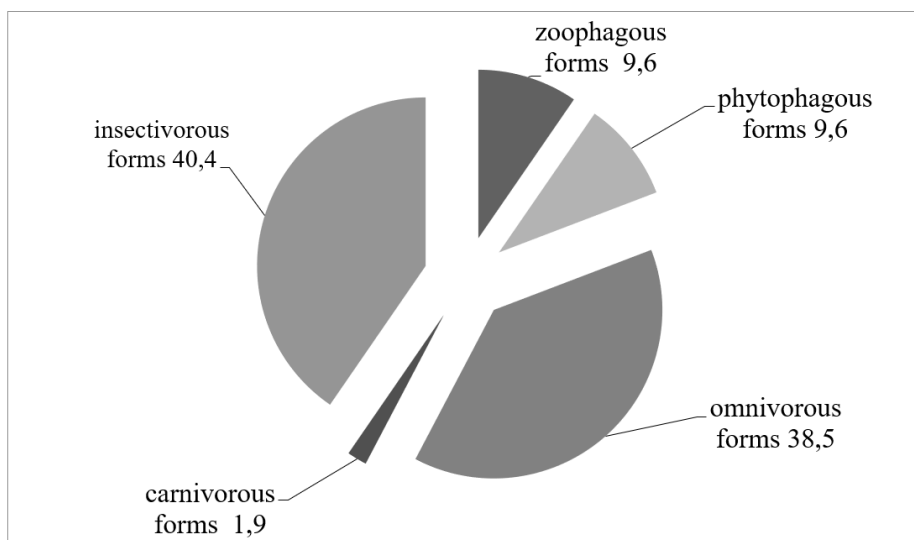


Figure 3. The nutritional spectrum of the avifauna in the "Rîșcani" park, %.

The zoophagous and phytophagous forms in the area are less common, represented by 5 species each, or by 9,6% each. Zoophagous birds feed on various invertebrates and small vertebrates: insects, their larvae, molluscs, worms, earthworms, lizards, frogs, tadpoles, fish etc. The phytophages have a diet that consists of food of plant origin, such as plant parts, seeds, fruits etc.

The carnivorous birds in the studied territory are represented by a single species – the long-eared owl (*Asio otus*). The long-eared owl feeds mainly on field mice, wood mice, rats, less often shrews, small birds, squirrels, moles and bats.

During the period of observations in the study area, only the representatives of the following phenological groups were observed: migratory birds present during summer and sedentary birds. The species that appear only during the warm period of the year for reproduction make up 29 bird species, which is 55,8%, the sedentary ones are also numerous – 23 species, or 44,2%. Of the migratory birds present during summer, we observed the representatives of the following genera: *Luscinia*, *Sylvia*, *Cuculus*, *Oriolus*, *Saxicola*, *Phoenicurus*, *Phyloscopus* etc. The sedentary birds found in the park belong to the families: *Picidae*, *Corvidae*, *Paridae*, *Fringillidae* etc.

Analysing the frequency of bird species in the research area, we concluded that rare species are very few – only 2 species, which represent 3,8%. The rare bird species detected in the research area are *Corvus monedula* and *Streptopelia turtur*.

Common bird species in the research area are the most numerous – 53,8% (28 species). There are such species as: *Anas platyrhynchos*, *Fulica atra*, *Columba livia*, *Columba*

palumbus, Apus apus, Dendrocopos syriacus, Dendrocopos major, Picus canus, Hirundo rustica, Delichon urbica, Motacilla alba, Oriolus oriolus, Sturnus vulgaris, Garrulus glandarius, Pica pica, Corvus frugilegus, Corvus corone cornix, Phyloscopus colibita, Phoenicurus ochrurus, Turdus merula, Parus major, Parus caeruleus, Passer domesticus, Passer montanus, Fringilla coelebs, Coccothraustes coccothraustes, Carduelis chloris, Carduelis carduelis.

The frequent species of the park birdlife, likewise, are quite numerous – 42,4% (22 species): *Gallinula chloropus, Streptopelia decaocto, Cuculus canorus, Alcedo atthis, Otus scops, Jynx torquilla, Acrocephalus arundinacesus, Sylvia communis, Sitta europea, Luscinia luscinia* etc.

Analysing the state and the conservation status of the avifauna in the “Rîșcani” park, we would like to mention that, of 52 species of birds present in the territory, not a single species is found in the Red Book of the Republic of Moldova. In contrast, 50 species or 96,2% of identified birds are included in the lists of the International Union for Conservation of Nature (IUCN), 44 species or 84,6% are mentioned in the lists of the Bern Convention and 3 species or 5,8% are present in the lists of the Bonn Convention (Fig. 4).

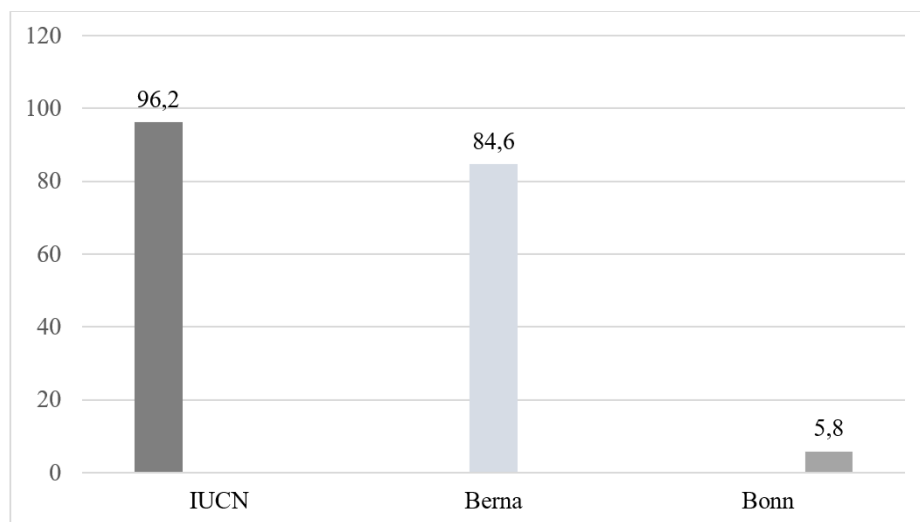


Figure 4. The conservation status of the avifauna of the “Rîșcani” park, %.

Bird species in the park on the Bern Convention lists are included in Appendix II - *Strictly protected fauna species* and Appendix III - *Protected fauna species*. For the protection of the species listed in Appendix II, the following is prohibited: all forms of deliberate capture and keeping, deliberate killing, the deliberate damage to or destruction

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of breeding or resting sites, the deliberate disturbance of wild fauna, particularly during vulnerable periods of life (breeding, hibernation etc.), the deliberate destruction or taking of eggs from the wild or keeping these eggs even if empty, the possession of and internal trade in these animals, alive or dead, including stuffed animals and any readily recognisable part or derivative thereof. Appendix III of the Convention covers protected species whose exploitation must be regulated in order to protect them [2]. In the lists of Appendix II of the Bern Convention, 33 species of birds found in the "Rîșcani" forest park are included. In the lists of Appendix III – 11 species.

4. CONCLUSIONS

- (1) In the territory of the "Rîșcani" forest park, 52 bird species were identified.
- (2) We recorded the greatest diversity of birds in the areas of the park with various bushes and trees of very different ages, but also with a low level of human presence.
- (3) Vegetation maintenance practices applied in the park and the expansion of recreational areas present a disturbing factor for bird species, in particular, for their reproduction process.
- (4) Most of the bird species are included in the lists of the International Union for Conservation of Nature and the Bern Convention.

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