

Short-term zoological monitoring in Zhongar-Alatau State National Nature Park with a focusing on the avifauna of the Osinovaya site

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Abstract. For long-term environmental and ecological research, it is essential to consider all components of the environment, including abiotic factors. Zhongar-Alatau State National Park is an area with unique habitats and a high biodiversity and is therefore a suitable area for new research on fauna. The aim of this monitoring research was to obtain information on the species diversity of small terrestrial mammals and avifauna in the Osinovaya site. The captured individuals were species identified and the skin integument and blood samples obtained will be used in further separate studies. In this report we provide an overview of the species monitored.

Key words: zoological monitoring, Zhongar-Alatau, birds, micro-mammalia

Characteristics of the site

Zhongar-Alatau State National Park is located on the northern slopes of the Dzungarian Alatau, a mountain range situated between the Tian Shan in the south and the Altai Mountains to the north. It was established in 2010 to protect the natural mountain landscapes, unique ecology, and the historical and aesthetic values of the Dzungarian Alatau, an isolated, glacier-covered mountain range in Kazakhstan on the southeastern border with China. The park territory belongs to the Tian Shan Mountain Steppe and Meadow Ecoregion - WWF ID PA 1019 (Carpenter and Pereladova 2022), which is characterized by its isolation and high biodiversity due to its altitudinal zones ranging from steppes to alpine meadows to glaciers, and as a transition zone between boreal, steppe and desert geographic areas. There is sufficient precipitation at mid-elevations to sustain forests (Carpenter and Pereladova 2022). Although the forests are predominantly pine

and spruce, there are significant stands of wild fruit trees in the park. Approximately 1% of the park's area is forested with Sievers apple (*Malus sieversii*), the ancestor of all cultivated apple varieties in the world (Dzhangaliev 2003; IUCN 2015). Sievers apple plantations are located at an altitude of 900-1800 m a.s.l. and present in separate, spaced, fields with an area ranging from several hundred square meters to several tens of hectares (Bakhtaulova et al. 2015).

The territory of the Zhongar Biosphere Reserve belongs to the Central Asian Subregion, Montana-Asia Province, Dzungar-Tian Shan District, Dzungar Region, according to the zoogeographic subdivision.

The fauna of Zhongar Biosphere Reserve includes two species of bony fish, two to four species of amphibians, 8 species of reptiles, at least 238 species of birds, and 54 species of mammals. During the 2015 survey, 575 insect species from 6 orders, 48 families, and genera were identified (www.kazmap.kz 2016).

Research methodology

The research was conducted over three days in mid-September 2022 at the Osinovaya site, (N45.40526°; E80.40581°; 1207 m a.s.l.), which is located in an apple forest. The aim of the research was to record the species distribution of birds and small ground mammals living at the site and to determine the potential for further research opportunities and activities.

Birds were captured in the ornithological nets which were checked regularly every two hours. After release from the nets, each individual was determined according field guide book (Ayé et al. 2012), and their basic morphological data (weight, length of tarso-metatarsus, tail length, bill length) were recorded.

Small ground mammals were captured in to Sherman live traps. After species determination, basic morphological data (weight, body length, hindlimb length, tail length) were recorded.

After sampling (blood, feathers, hair), animals were immediately released at the trapping site.

Conclusion

Of the small ground mammals, *Apodemus silvaticus* (n = 20) were the dominant species. The frequency of other caught species was low: *Apodemus agrarius* (n = 1), *Microtus* sp. (n = 2), and *Crociodura suaveolens* (n = 1).

Order	Latin name	No. of captured individuals
Caprimulgiformes	<i>Caprimulgus europaeus</i>	1
Passeriformes	<i>Aegithalos caudatus</i>	10
	<i>Cornuca cornuca althae</i>	2
	<i>Cyanistes cyanus</i>	6
	<i>Chloris chloris</i>	1
	<i>Parus major</i>	29
	<i>Periparus ater</i>	7
	<i>Phoenicurus coeruleocephala</i>	1
	<i>Phylloscopus collybita</i>	1
	<i>Phylloscopus collybita tristis</i>	1
	<i>Phylloscopus humei</i>	7
	<i>Troglodytes troglodytes</i>	1
	<i>Turdus atrogularis</i>	9
	<i>Turdus merula</i>	1

Table 1. List of captured birds in Osinovaya.

Most of the birds belonged to the order Passeriformes (n = 76), only one bird belonged to the order Caprimulgiformes. The list and number of birds captured is given in Table 1.

To study the environmental burden of heavy metal (Hg), skin integuments as fur and tail feather were collected from the captured animals. Blood was collected from the vena brachialis of the birds and a blood smear was taken and later examined for the detection of blood parasites. The results of these investigations will be published in separate studies.

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References

- Ayé, R., Schweizer, M. and Roth, T. 2012: Birds of Central Asia. Bloomsbury Publishing, London.
- Bakhtaulova, A.S., Oksikbayev, B.K., Kanagatov, Z.Z. and Dzhankulduková, A.Z. 2015: Study of histostructure of ray parenchyma and rooting ability of Sievers apple (*Malus sieversii*) endemic species in green cutting. *Oecologia Montana*, **24**: 70-73.
- Carpenter, C. and Pereladova, O. 2022: Tian Shan montane steppe and meadows. Online: <https://www.world-wildlife.org/ecoregions/pa1019> (retrieved: 25.10.2022)
- Dzhangaliev, A.D. 2003: The wild apple tree of Kazakhstan. *Horticultural reviews-westport the New York*, **29**: 63-304.
- IUCN (International Union for Conservation of Nature and Natural Resources) 2015: Participants of the FFI/IUCN SSC Central Asian regional tree Red Listing workshop, Bishkek, Kyrgyzstan (11-13 July 2006). *Malus sieversii*. The IUCN Red List of Threatened Species 2007: e.T32363A9693009. Online: <http://dx.doi.org/10.2305/IUCN.UK.2007.RLTS.T32363A9693009.en> (retrieved: 28.11.2022)
- www.kazmap.kz 2016: „Zhongar” Biosphere Reserve. Kazakhstan National Committee for the UNESCO Programme “Man and the Biosphere” (MAB). Online: <https://www.kazmab.kz/index.php/en/biosphere-reserves/2016-01-25-13-17-07/zhongar/description> (retrieved: 29.11.2022)

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