ECOLOGICAL GROUPS OF MAMMALS FOUND IN THE CENTRAL KYZYLKUM NATIONAL NATURE PARK AND ADJACENT AREAS

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Annotation. *The article highlights that due to the expansion of human activity today and the increasing impact on nature, the need arises to preserve and restore rare and endangered wildlife species, as well as to maintain the diversity and ecological stability of mammals. As a result of the research, 19 mammal species inhabiting this area were classified into three ecological groups: terrestrial biotopes, underground burrow-dwelling species, and aquatic biotope species.*

Keywords: *animal diversity, anthropogenic factors, bioecological characteristics, population.*

Аннотация*. В статье отмечается, что в связи с расширением человеческой деятельности и увеличением воздействия на природу возникает необходимость сохранения и восстановления редких и исчезающих видов животного мира, а также поддержания разнообразия и экологической устойчивости млекопитающих. В результате исследования 19 видов млекопитающих, обитающих на данной территории, были разделены на три экологические группы: наземную биотопную группу, группу видов, обитающих в подземных норах, и водную биотопную группу.»*

Ключевые слова: *Разнообразие животных, антропогенные факторы, биоэкологические характеристики, популяция.*

Introduction

Protecting nature means caring for the happiness of all humanity and the fate of future generations. Therefore, in order to expand the area of protected natural territories, preserve natural objects and complexes of ecological value, and conserve and restore rare and endangered species of flora and fauna, on February 16, 2022, President Shavkat Mirziyoyev signed a decree “On measures to establish protected natural areas within the system of the State Committee for Ecology and Environmental Protection of the Republic of Uzbekistan.” The proposal to establish the “Central Kyzylkum National Nature Park” was approved. In recent years,

comprehensive measures have been implemented to preserve and restore natural territories, improve the ecological environment, and ensure the rational use of natural resources through the expansion and development of protected natural areas.

The Central Kyzylkum National Nature Park is located in the Uchkuduk district of Navoi region, within the Kyzylkum Desert—one of the large deserts of the Turan Plain. Its northeastern part borders the state boundary with Kazakhstan. The park represents a geographical territory characterized by large sand dunes, plains, and low depressions, forming a unique natural-climatic environment within Central Asia.

Global environmental problems, particularly anthropogenic factors, negatively affect nature, including the distribution and bioecological characteristics of mammals. This leads to a decline in the populations of certain species and a reduction in their habitats. Therefore, it is vital to study mammals from an ecological perspective, manage their populations, and use them in ways that align with human interests.

Materials and Methods

Between 2024 and 2025, observations on the bioecology, distribution, habitats, abundance, and conservation of mammals were conducted across various natural areas of the **Central Kyzylkum National Nature Park**. The methods of G.A. Novikov (1947) and G. Kolya (1979) were applied in the research.

In total, studies were carried out at 15 observation points, including deserts, semi-deserts, water bodies, saxaul forests, and lowland plains. Most of the area consists of sandy soils, stony deserts, saline lands, and sand dunes. The vegetation is dominated by desert plants such as saxaul (*Haloxylon*), Calligonum, *Anabasis*, and *Artemisia*.

Based on habitat preferences, mammals in the Central Kyzylkum National Nature Park can be classified into three ecological groups:

1. **Terrestrial species** Examples: *Gazella subgutturosa*, *Equus hemionus*, *Sus scrofa*, *Cervus elaphus bactrianus*. These species are adapted to walking on solid ground, can run fast, have good vision, and are heat-tolerant.

2. **Fossorial species (burrow-dwelling)** Examples: *Allactaga elater*, *Citellus fulvus*, *Apodemus agrarius*. They dig burrows using their forelimbs and forage for food on the surface.

3. **Aquatic species** Examples: *Lutra lutra* (European otter), *Ondatra zibethica* (muskrat), *Myocastor coypus* (nutria).These species feed on fish, amphibians, and mollusks.

4. **Flying mammals** Examples: *Nyctalus noctula*, *Barbastella leucomelas*, *Rhinolophus bocharicus*. They primarily feed on insects and inhabit rock crevices or tree cavities.

Ecological groups based on diet Mammals were classified according to feeding type as follows:

- **Herbivores (phytophages)** – 11 species (e.g., rodents, even-toed and odd-toed ungulates). Their teeth are adapted for grinding plant material, and they have long intestines.
- **Carnivores (zoophages)** – 5 species (e.g., foxes, wolves, felids). They have sharp teeth and feed on fish, birds, and rodents.
- **Omnivores (polyphages)** – 1 species.
- **Insectivores** – 2 species.

Observations and Discussion The results indicate that mammal populations in the Central Kyzylkum National Nature Park fluctuate annually, particularly among rodents and predators. A decrease in precipitation and thinning of plant cover reduces the number of grazing animals. Some species enter summer torpor (hibernation) or shift their habitats, as observed around the lake in 2023–2025.

These changes lead to the migration of animals into other biotopes, allowing predators and venomous reptiles to enter new areas. Thus, environmental changes significantly impact the structure of local biocenoses. The presence of small and rare species highlights the necessity of strengthening ecological conservation efforts.

Scientific Conclusions on Mammal Ecological Groups in the Central Kyzylkum National Nature Park

1. Terrestrial mammals

- **Ecological significance:** They form the core functional component of the desert ecosystem. Population dynamics depend directly on climate, forage biomass, and predator presence.
- **Adaptations:** Long-distance migration, heat tolerance, survival on dry forage (e.g., gazelles, hares). Predators display broad hunting strategies in response to prey scarcity (wolves, foxes).
- **Role in the ecosystem:** Large herbivores regulate plant biomass; predators control rodent populations.
- **Threats:** Pasture pressure, poaching, habitat degradation.

2. Fossorial mammals

- **Ecological significance:** They determine the structural dynamics of Kyzylkum soils. Burrowing improves soil aeration and mixes organic matter.
- **Adaptations:** Reduced vision, acute hearing and vibration sensitivity, low metabolism, low water consumption, and colonial life (e.g., mole rats, jerboas).

- **Role in the ecosystem:** Soil bioturbation; rodents serve as a primary energy source for predators; some species participate in zoonotic cycles (*Rhombomys*).
- **Threats:** Anthropogenic changes (wells, roads), exposure to toxic substances.

CONCLUSION

The Central Kyzylkum National Nature Park represents one of Uzbekistan's largest desert ecosystems, distinguished by its unique climate, relief, and vegetation. Its mammalian fauna is rich and diverse in ecological groups, playing crucial roles in maintaining desert ecosystem stability, trophic interactions, soil processes, and plant community balance.

Terrestrial large and medium-sized mammals are key structural components, with population dynamics closely linked to plant biomass and predator-prey interactions. Burrowing rodents drive soil aeration, organic matter cycling, and bioturbation. Nocturnal species demonstrate evolutionary strategies for energy and water conservation in high-temperature desert conditions. Bats regulate insect populations, and predators maintain population stability. Large herbivores like gazelles ensure the stability of pastures and saxaul thickets and regulate plant community composition.

However, anthropogenic pressures—such as pasture expansion, saxaul harvesting, poaching, and reduced water sources—pose significant threats to these ecological groups, potentially leading to faunal decline, disruption of trophic systems, and desert landscape degradation.

In conclusion, the ecological groups of mammals in the Central Kyzylkum are not only an integral part of biodiversity but also key mechanisms ensuring the long-term stability of the desert ecosystem. Scientific measures are being taken to enhance monitoring, expand protected areas, and restore habitats for desert wildlife.

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