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MODERN SPECIES COMPOSITION AND DISTRIBUTION MAP OF SOUTHERN KYZYLKUM LIZARDS

Abstract: *this study presents current data on the species composition and distribution of lizards in the Southern Kyzylkum Desert. Field investigations were conducted at 11 stationary sites using route survey methods. During a total survey distance of 58.7 km, 688 individuals belonging to 19 species of the families Gekkonidae, Agamidae, Lacertidae, Scincidae, and Varanidae were recorded. Species occurrence and abundance varied depending on habitat conditions, with the highest diversity observed in sandy desert ecosystems. The obtained results provide updated information on the current state of lizard fauna in the Southern Kyzylkum and contribute to a better understanding of their spatial distribution and biodiversity conservation in the arid ecosystems of Central Asia.*

Keywords: *Southern Kyzylkum, lizards, species composition, distribution*

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СОВРЕМЕННЫЙ ВИДОВОЙ СОСТАВ И КАРТА РАСПРОСТРАНЕНИЯ ЯЩЕРИЦ ЮЖНОГО КЫЗЫЛКУМА

Аннотация: *в статье представлены актуальные данные о видовом составе и распространении ящериц в пустыне Южный Кызылкум. Полевые*

исследования проводились на 11 стационарных участках с использованием методов маршрутного обследования. На общей дистанции обследования 58,7 км было зарегистрировано 688 особей, принадлежащих к 19 видам семейств *Gekkonidae*, *Agamidae*, *Lacertidae*, *Scincidae* и *Varanidae*. Частота встречаемости и численность видов варьировались в зависимости от условий среды обитания, причем наибольшее разнообразие наблюдалось в экосистемах песчаных пустынь. Полученные результаты предоставляют актуальную информацию о современном состоянии фауны ящериц в Южном Кызылкуме и способствуют лучшему пониманию их пространственного распространения и сохранения биоразнообразия в засушливых экосистемах Центральной Азии.

Ключевые слова: Южный Кызылкум, ящерицы, видовой состав, распространение.

Introduction. The Kyzylkum Desert is one of the largest arid regions in Central Asia and represents an important center of reptile diversity. Owing to the heterogeneity of landscapes and habitats, the region supports numerous lizard species adapted to extreme desert conditions. Previous studies have provided valuable information on the taxonomy, ecology, and distribution of reptiles in Central Asia and the Kyzylkum Desert [4; 6]. However, recent changes in natural and anthropogenic environments necessitate updated assessments of species composition and distribution patterns. Therefore, the present study aims to evaluate the current diversity and distribution of lizards in the Southern Kyzylkum Desert.

Materials and Methods. Field studies were conducted in the Southern Kyzylkum Desert at 11 stationary sites representing different habitats. Surveys were carried out in six biotopes using route count methods (Fig. 1).

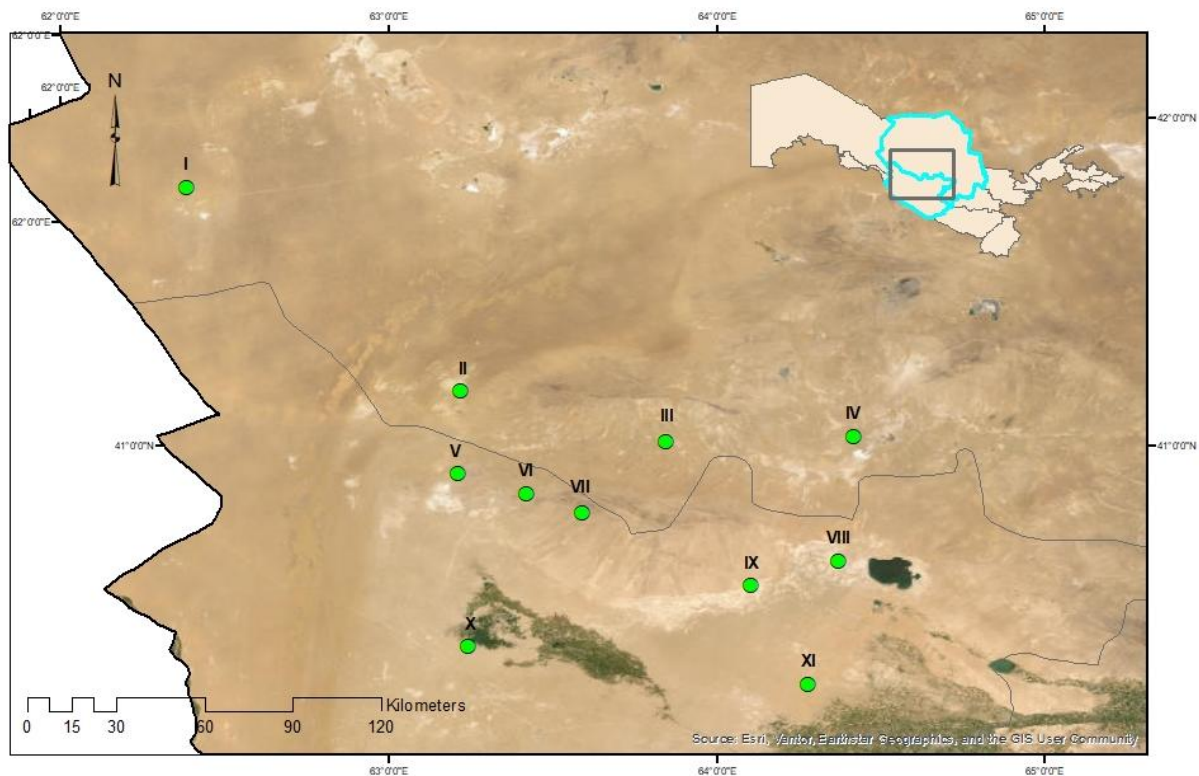


Fig. 1. Study area (I-XI – stationary zone)

Depending on the habitat type, the width of transects ranged from 2 to 8 m, with a total survey distance of 58.7 km (Bondarenko 1996; Dinesman et al., 1952). The study area was delineated using GIS technologies in ArcGIS Pro. Geographic coordinates of recorded species were determined using a Garmin GPSMAP 65s navigator (Table 1).

Table 1

Characteristics of the study area

Stationary	Coordinate	Date	Landscape
I	41°46' N, 62°25' E	12.04.2025	Soil with a mass of shifting sands and reinforced vegetation cover
II	41°10' N, 63°14' E	22-23.05.2025	Foothills with perennial vegetation cover, fine-gravel sands
III	41°07' N, 63°53' E	14.06.2025	Foothills with perennial vegetation cover, fine-gravel sands
IV	41°00' N, 64°24' E	15-16.06.2025 25.05.2026	Takyr and salt flats
V	40°56' N, 63°13' E	11.04.2025 07-09.05.2026	Takyr and salt flats
VI	40°52' N, 63°35' E	12.04.2025 10-11.05.2026	Foothills with perennial vegetation cover, fine-gravel sands
VII	40°41' N, 63°49' E	12.05.2026	Foothills with perennial vegetation cover, fine-gravel sands

VIII	40°38' N, 64°22' E	28-30.03.2026	Unconsolidated sands and fine-gravel sands
IX	40°33' N, 64°07' E	10-08.2025 04-06.05.2026	Unstabilized sands, takyr lands, and salt flats with sparse perennial vegetation
X	40°21' N, 63°15' E	10-13.04.2026	A mass of fine-gravel sands and shifting sands
XI	40°13' N, 64°16' E	14-16.06.2025 20-21.03.2026	A mass of fine-gravel sands and shifting sands

Species identification and abundance assessments were based on direct visual observations. Nocturnal species were surveyed using artificial light sources during night-time observations. During the surveys, a total of 688 individuals were recorded. The collected data were used to analyze the current species composition and distribution patterns of lizards in the study area.

Results. A total of 688 individuals were recorded during field surveys conducted along 58.7 km of transects in the Southern Kyzylkum Desert. The lizard fauna comprised 19 species belonging to five families. Gekkonidae was represented by seven species, namely *Alsophylax laevis*, *Alsophylax pipiens*, *Crossobamon eversmanni*, *Teratoscincus scincus*, *Mediodactylus russowi*, *Tenuidactylus fedtschenkoi*, and *Tenuidactylus caspius*. Agamidae included *Phrynocephalus helioscopus*, *Phrynocephalus interscapularis*, *Phrynocephalus mystaceus*, *Phrynocephalus reticulatus*, and *Trapelus sanguinolentus*. Lacertidae was represented by *Eremias velox*, *Eremias scripta*, *Eremias lineolata*, *Eremias intermedia*, and *Eremias grammica*. Varanidae and Scincidae were represented by *Varanus griseus* and *Ablepharus deserti*, respectively (Table 2).

Table 2

Species distribution in the study areas

№	Lizard species	Stasionary										
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Agamidae												
1	<i>Phrynocephalus helioscopus</i>		+	+		+	+	+	+	+		+
2	<i>Phrynocephalus interscapularis</i>	+			+		+		+	+	+	+
3	<i>Phrynocephalus mystaceus</i>				+				+		+	+
4	<i>Phrynocephalus reticulatus</i>	+	+	+	+				+	+	+	+
5	<i>Trapelus sanguinolentus</i>	+	+	+	+		+	+	+	+	+	+
Gekkonidae												
6	<i>Alsophylax laevis</i>		+					+				

7	<i>Alsophylax pipiens</i>		+					+				
8	<i>Crossobamon eversmanni</i>	+			+				+		+	
9	<i>Teratoscincus scincus</i>				+				+		+	+
10	<i>Mediodactylus russowi</i>				+				+			+
11	<i>Tenuidactylus fedtschenkoi</i>								+			+
12	<i>Tenuidactylus caspius</i>	+					+					+
Varanidae												
13	<i>Varanus griseus</i>	+	+				+	+	+	+		+
Lacertidae												
14	<i>Eremias velox</i>						+	+	+			+
15	<i>Eremias scripta</i>				+						+	+
16	<i>Eremias lineolata</i>	+			+	+		+	+	+	+	+
17	<i>Eremias intermedia</i>		+				+	+				+
18	<i>Eremias grammica</i>	+			+					+	+	+
Scincidae												
19	<i>Ablepharus deserti</i>								+			+

Analysis of species occurrence among stationary sites revealed considerable differences in distribution patterns. *Trapelus sanguinolentus* showed the widest distribution and was recorded in almost all sampling sites. Among agamids, *Phrynocephalus helioscopus*, *Phrynocephalus interscapularis*, and *Phrynocephalus reticulatus* were also widely distributed, whereas *Phrynocephalus mystaceus* occurred only in several localities. Among geckos, *Tenuidactylus caspius*, *Mediodactylus russowi*, and *Teratoscincus scincus* were encountered in several stations, while *Alsophylax laevis*, *Alsophylax pipiens*, and *Crossobamon eversmanni* had more restricted distributions. Among Lacertidae, *Eremias lineolata* was recorded in most stations and represented one of the most widespread species, whereas *Eremias intermedia* and *Eremias grammica* occurred less frequently. *Varanus griseus* was observed in several stations, indicating a relatively broad distribution despite its low abundance. *Ablepharus deserti* was recorded only in a limited number of sites, reflecting its narrow ecological requirements. Among the recorded families, Gekkonidae exhibited the highest species richness, accounting for 36.8% of the total number of species, followed by Agamidae and Lacertidae (26.3% each). Species distribution varied among habitats, with sandy biotopes supporting the highest diversity, while *Varanus griseus* and *Ablepharus deserti* were recorded less frequently.

The Southern Kyzylkum Desert supports a diverse lizard fauna comprising 19 species from five families. Representatives of Gekkonidae exhibited the highest species richness, while *Trapelus sanguinolentus* and *Eremias lineolata* showed the widest distribution among the 11 stationary sites. Species composition and distribution varied among habitats, with sandy biotopes supporting the greatest diversity. The obtained results confirm the importance of the Southern Kyzylkum as a key center of reptile diversity in Central Asia and provide a basis for future monitoring and conservation efforts.

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