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Research Article

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First remarks on the spider fauna (Arachnida: Araneae) of the Karkaraly State National Natural Park: the extension of data for Central Kazakhstan

This paper presents the first scientific data on the diversity of spiders (order Araneae) in the Karkaraly State National Natural Park (Karaganda Region, Kazakhstan). Field material was collected in the Kendara Valley, near of Lake Shaitankol, and at the field practice station of the E.A. Buketov Karaganda National Research University using trap lines, soil sampling, and manual collection during July and August 2025. Fifty two species of spiders were identified; 5 families and 40 species are reported for the first time for Central Kazakhstan according to non-digitized literature data and the Global Biodiversity Information Facility. The results considerably expanded the information available through GBIF on the species diversity of the order Araneae in Central Kazakhstan. Differences were identified in the species diversity recorded via the iNaturalist app and based on collections using traditional field methods. It was concluded that large-scale field studies of spiders in Central Kazakhstan are necessary, as well as the digitization and mobilization of data published in the literature through the GBIF portal.

Keywords: spiders, Central Kazakhstan, Karaganda Region, GBIF, iNaturalist.

Introduction

Invertebrates are still poorly represented in open biodiversity data repositories such as the Global Biodiversity Information Facility (GBIF) [1–3]. This limits the possibilities for using the data and leads to bias in the estimates obtained [4, 5]; as well as to a situation where widespread species may be wrongly considered as rare. Therefore, the filling gaps in the digital biodiversity map are a relevant problem.

In recent years, the study of the spider fauna (order Araneae) of Kazakhstan has intensified once again [6–8]. However, most research is located in Southern, Western, and Northern parts of the country [9]. The spider fauna of Central Kazakhstan (modern Karaganda and Ulytau Regions) has poorly been studied. Only a few studies from Central Kazakhstan are known. Obtained results have been published [10–19] but remain non-digitized and inaccessible to researchers. To this day 94.6 % GBIF occurrences of spiders from Central Kazakhstan are derived from the iNaturalist citizen science platform [20].

Our study focuses on providing high-quality digital scientific data on the spider fauna of the Karkaraly State National Natural Park and assessing the contribution of this information to the GBIF and non-digitized literature data on spiders in Central Kazakhstan.

Experimental

Karkaraly State National Natural Park is located in the east part of Karaganda Region, about 220 km east from Karaganda city. The Park was established in 1998 for preserving and restoring the unique natural complexes of the Karkaraly and Kent mountain boreal forests. The total area is 112,120 hectares, of which, 40,341 hectares are forested. The climate is sharply continental [21]. The average annual air temperature is +3.6, the average annual precipitation is 293 mm [22].

The current work is based on the material collected in the Park in June, July, and August 2025. In August spiders were sampled by participants of the IX Field School on Soil Zoology and Ecology for Young Scientists that was organized by Buketov Karaganda National Research University. Spiders were sampled using pitfall-traps, hand sorting and manual collection. The material was collected by authors (FDS — Fetisov D.S., INV — Ivanova N.V., KLV — Kim L.V., PEV — Plakkhina E.V., FAA — Fedorova A.A.) and our colleague (SMP — Shashkov M.P.). When no collector is specified, the material was sampled collectively by the participants of the Field School. Type of habitats of occurrences specified if available. Spiders were collected in the following locations: Kendara Valley (1), Karaganda Buketov University field station (2), Shaitankol Lake vicinity (3) and Three caves (4) (Fig. 1).

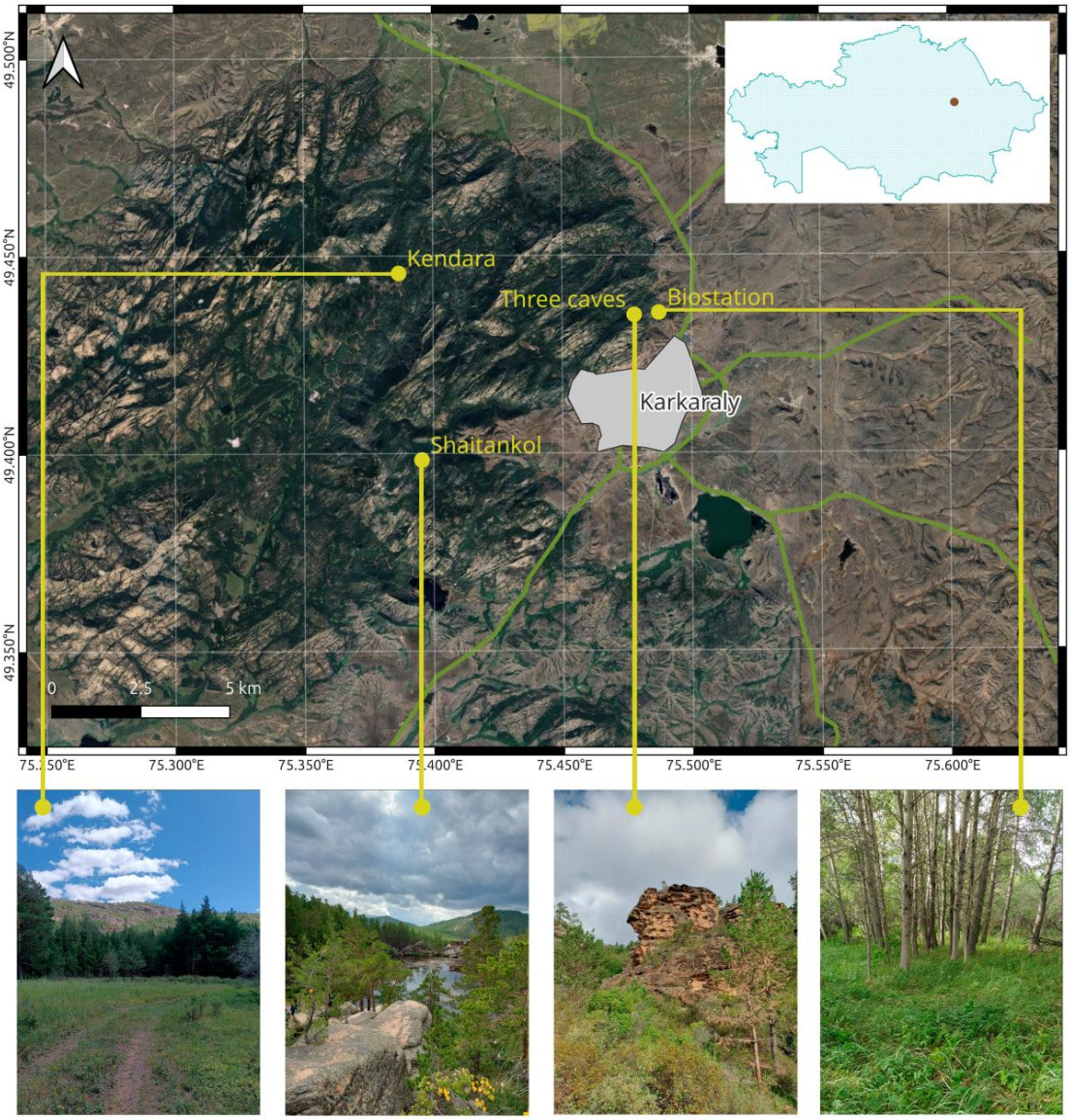

Figure 1. The map of locations: Kendara — Kendara Valley (1), Biostation — Karaganda Buketov University field station (2), Shaitankol — Shaitankol Lake vicinity (3), Three Caves (4)

The identification of spiders was carried out at the Invertebrate Zoology Department of Perm State University (Russia) by prof. S.L. Esyunin, at the Center of Forest Ecology and Productivity of the Russian Academy of Science by PhD student D.S. Fetisov, at the Institute of Zoology of Republic of Kazakhstan by master of science L.V. Kim. Species list follows the World Spider Catalog [23]. Data on species distribution are taken from “Catalogue of the spiders (Arachnida, Aranei) of Left-Bank Ukraine” [24] and “Spiders of the

Udmurt Republic: fauna, ecology, phenology and distribution" [25]. All species occurrence data were digitized and published through the GBIF [26, 27].

The obtained spider species list was compared with data available through GBIF for Central Kazakhstan [28] and Karkaraly State National Natural Park [29], as well as non-digitized literature data. For this we georeferenced collected sites from published articles [10–19] and compiled the species list mentioned there. The taxonomical analysis was performed in the R environment [30] using Venn diagrams (library ggVennDiagram [31]).

Results and Discussion

During the summer 2025 survey 228 spider specimens, belonging to 52 species, 30 genera, and 15 families were recorded. A total of 107 specimens were identified to species level. In terms of zoogeographical composition, species with Trans-Eurasian (21.2 %), Trans-Palaearctic (19.2 %) and Circum-Holarctic (13.46 %) ranges predominate in our collection. The list of recorded species is provided below. The species marked for the first time for the region are highlighted with an asterisk (*).

ARANEIDAE

Aculepeira ceropegia* (Walckenaer, 1802) MATERIAL. 1♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. NVI, FAA; 1♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. NVI, FAA. RANGE TYPE. West-Central Eurasian.

***Araneus angulatus* Clerck, 1757** MATERIAL. 1 ♀ (1), 49.43588 N, 75.48829 E, manual collection, 22.VIII.2025, leg. FDS; 2♀♀ (1), 49.43915 N, 75.38949 E, manual collection, 12.VII.2025, leg. NVI, PEV; 1 juv (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII. 2025, leg. NVI, FAA. RANGE TYPE. Trans-Palaearctic.

***Araneus diadematus* Clerck, 1757** MATERIAL. 2♀♀ (2), 49.43588 N, 75.48829 E, manual collection, 22.VIII.2025, leg. FDS; 3♂♂, 1♀ (1), 49.43915 N, 75.38949 E, manual collection, 12.VII.2025, leg. NVI, FAA; 1♂, 2♀♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14VII.2025, leg. NVI, FAA. RANGE TYPE. Trans-Palaearctic.

Araneus marmoreus* Clerck, 1757 MATERIAL. 1♀ (1), 49.43915 N, 75.38949 E, manual collection, 12.VII. 2025, leg. NVI, FAA. RANGE TYPE. Circum-Holarctic.

Araniella tbilisiensis (Mcheidze, 1997)* MATERIAL. 1♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII. 2025, leg. NVI, FAA. RANGE TYPE. Central — Ancient Mediterranian.

Cyclosa oculata* (Walckenaer, 1802) MATERIAL. 1♂ (2), 49.43588 N, 75.48829 E, manual collection, 22-24.VIII.2025, leg. PEV. RANGE TYPE. Trans-Eurasian.

CLUBIONIDAE

Clubiona pallidula* (Clerck, 1757) MATERIAL. 1♀ (2), 49.43319 N, 75.48624 E, birch forest, hand sorting, 23.VIII.2025. RANGE TYPE. Trans-Eurasian.

DOLOMEDIDAE

Dolomedes fimbriatus* (Clerck, 1757) MATERIAL. 1♂, 1 sub♀ (1), 49.4609 N, 75.38732 E, manual collection, 15.VII.2025, leg. INV, FAA. RANGE TYPE. Trans-Eurasian.

GNAPHOSIDAE

***Gnaphosa pilosa* Savelyeva**, 1972 MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII. 2025, leg. KLV. RANGE TYPE. Central-Asian. Karaganda Region, Karkaraly District, Kent mountains (now part of the National Park). 49.20511 N, 75.95193 E [13].

Haplodrassus umbratilis* (L.Koch, 1866) MATERIAL. 1♀ (2), 49.43496 N, 75.48955 E, hill slope, pitfall-traps, 22-24.VIII.2025. RANGE TYPE. European — West Siberian.

LINYPHIIDAE

Bolyphantes alticeps* (Sundevall, 1833) MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 22-24.VIII.2025, leg. PEV; 1♀ (4), 49.4291 N, 75.4782 E, manual collection, 23.VIII.2025, leg. FDS. RANGE TYPE. Trans-Eurasian.

Drapetisca socialis* (Sundevall, 1833) MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 22-24.VIII.2025, leg. PEV; 1♂, 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg.

FDS; 2♂♂, 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Trans-Eurasian.

Erigone dentipalpis* (Wider, 1834) MATERIAL. 1♂ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. FDS. RANGE TYPE. Trans-Palaearctic.

Gongylidium rufipes* (Linnaeus, 1758) MATERIAL. 2 sub♀ (2), 49.43319 N, 75.48624 E, birch forest, hand sorting, 23.VIII.2025. RANGE TYPE. Trans — Euro Siberian.

Helophora insignis* (Blackwall, 1841) MATERIAL. 1♂1♀ (2), 49.43319 N, 75.48624 E, birch forest, hand sorting, 23.VIII.2025. RANGE TYPE. Circum-Holarctic.

Linyphia triangularis* (Clerck, 1757) MATERIAL. 1♀ (4), 49.4291 N, 75.4782 E, manual collection, 23.VIII.2025, leg. KLV; 1♀ (3), 49.3997 N, 75.3993 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Trans-Eurasian.

***Megalepthyphantes kronebergi* (Tanasevitch, 1989)** MATERIAL. 1♂ (4), 49.4291 N, 75.4782 E, manual collection, 23.VIII.2025, leg. KLV; 1♂ (4), 49.4291 N, 75.4782 E, manual collection, 23.VIII.2025, leg. FDS. RANGE TYPE. Central Asian.

Neriene radiata* (Walckenaer, 1841) MATERIAL. 1♀ (4), 49.4291 N, 75.4782 E, manual collection, 23.VIII.2025, leg. FDS. RANGE TYPE. Circum-Holarctic.

Tapinocyba insecta* (L.Koch, 1869) MATERIAL. 1♀ (3), 49.4039 N, 75.40567 E, pine forest, hand sorting, 23.VIII.2025. RANGE TYPE. European — West Siberian.

***Trichoncoides piscator* (Simon, 1884)** MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 22.VIII.2025, leg. FDS. RANGE TYPE. West-Central Ancient Mediterranean.

LYCOSIDAE

Alopecosa steppica* Ponomarev, 2007 MATERIAL. 4♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Ancient Mediterranean (West — European Kazakhstan).

Alopecosa taeniopus* (Kulczyński, 1895) MATERIAL. 3♂, 1♀, 4juv (2), 49.43496 N, 75.48955 E, hill slope, pitfall-traps, 22-24.VIII.2025. RANGE TYPE. West European — Central Ancient Mediterranean.

Pardosa agrestis* (Westring, 1861) MATERIAL. 1♀ (2), 49.43496 N, 75.48955 E, hill slope, pitfall-traps, 22-24.VIII.2025; 1♀ (2), 49.43319 N, 75.48624 E, aspen forest, pitfall-traps, 22-24.VIII.2025. RANGE TYPE. West-Eurasian.

Pardosa lugubris* (Walckenaer, 1802) MATERIAL. 1♂, 5♀ (2), 49.43319 N, 75.48624 E, aspen forest, pitfall-traps, 22-24.VIII.2025; 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.25, leg. KLV; 1♀ (3), 49.3997 N, 75.3993 E, 23.VIII.25, leg. KLV; 1♀ (1), 49.44994 N, 75.39511 E, manual collection, leg. INV, FAA. RANGE TYPE. West-Eurasian.

Piratula hygrophila* (Thorell, 1872) MATERIAL. 1♂ (2), 49.43319 N, 75.48624 E, aspen forest, pitfall-traps, 22-24.VIII.2025; 1♀ (1), 49.45195 N, 75.38371 E, pine forest in the floodplain of the creek, hand sorting, leg. SMP. RANGE TYPE. West-Eurasian.

Trochosa terricola* Thorell, 1856 MATERIAL. 1♂ (2), 49.43319 N, 75.48624 E, aspen forest, pitfall-traps, 22-24.VIII.2025; 1♂ (2), 49.43496 N, 75.48955 E, hill slope, pitfall-traps, 22-24.VIII.2025; 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. KLV; 1♀ (1), 49.44414 N, 75.38085 E, aspen forest with birch and pine trees, hand sorting, 8.VI.2015, leg. SMP; 1♀, 1juv (1), 49.44476 N, 75.37503 E, abandoned cattle pen with ruderal vegetation, hand sorting, 10.VI.2015, leg. SMP; 1 ♀ (1), 49.44423 N, 75.37658 E, last year's abandoned vegetable garden, ruderal vegetation, hand sorting, 11.VI.2025, leg. SMP. RANGE TYPE. Circum-Holarctic.

Xerolycosa nemoralis* (Westring, 1861) MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Trans-Eurasian.

MIMETIDAE

Mimetus laevigatus* (Keyserling, 1863) MATERIAL. 1♂ (2), 49.43588 N, 75.48829 E, manual collection, 22.VIII.2025, leg. FDS. RANGE TYPE. West-Central Ancient Mediterranean.

MITURGIDAE

Zora pardalis* Simon, 1878 MATERIAL. 1 sub♂ (2), 49.43588 N, 75.48829 E, manual collection, 22-24.VIII.2025, leg. PEV. RANGE TYPE. West-Central Ancient Mediterranean.

PHILODROMIDAE

Emargidromus emarginatus* (Schrank, 1803) MATERIAL. 1♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. INV, FAA. RANGE TYPE. Trans-Eurasian.

Philodromus cespitum* (Walckenaer, 1802) MATERIAL. 1♀ (1), 49.43915 N, 75.38949 E, manual collection, 12.VII.2025, leg. INV, FAA. RANGE TYPE. Circum-Holarctic.

PHOLCIDAE

***Pholcus ponticus* Thorell, 1875** MATERIAL. 1♂ (2), 49.43588 N, 75.48829 E, manual collection, 22.VIII.2025, leg. FSD. RANGE TYPE. Eastern-Europe — Central Ancient Mediterranean.

SALTICIDAE

Dendryphantes rudis* (Sundevall, 1833) MATERIAL. 1♀ (3), 49.3997 N, 75.3993 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Trans — Euro-Siberian.

***Evarcha arcuata* (Clerck, 1757)** MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg, FDS; 1 ♂ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. INV, FAA. RANGE TYPE. Trans-Palaearctic.

TETRAGNATHIDAE

Metellina segmentata* (Clerck, 1757) MATERIAL. 1♀ (1), 49.45195 N, 75.38371 E, pine forest in the floodplain of the creek, hand sorting, 12.VII.2025, leg, SMP. RANGE TYPE. Trans-Palaearctic.

Pachygnatha degeeri* Sundevall, 1830 MATERIAL. 1♂ (2), 49.43319 N, 75.48624 E, aspen forest, pitfall-traps, 22-24.VIII.2025. RANGE TYPE. Trans-Palaearctic.

Tetragnatha montana* Simon, 1874 MATERIAL. 1♀ (1), 49.43915 N, 75.38949 E, manual collection, 12.VII.2025, leg. INV, FAA. RANGE TYPE. Trans-Eurasian.

THERIDIIDAE

Enoplognatha latimana* Hippa & Oksala, 1982 MATERIAL. 1♀ (3), 49.39903 N, 75.39529 E, pine forest, hand sorting, 23.VIII.2025. RANGE TYPE. West-Palaearctic.

Enoplognatha ovata* (Clerck, 1757) MATERIAL. 1♀ (1), 49.45195 N, 75.38371 E, pine forest in the floodplain of the creek, hand sorting, 12.VII.2025, leg. SMP; 1 sub♀ (1), 49.44414 N, 75.38085 E, aspen forest with birch and pine trees, hand sorting, leg. SMP. RANGE TYPE. Trans-Palaearctic.

Episinus truncatus* Latreille, 1809 MATERIAL. 1♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. INV, FAA. RANGE TYPE. West-Palaearctic.

Euryopis flavomaculata* (C.L. Koch, 1836) MATERIAL. 1 sub♂ (2), 49.43781 N, 75.49352 E, birch forest, hand sorting, 23.VIII.2025. RANGE TYPE. Trans-Palaearctic

Parasteatoda tabulata* (Levi, 1980) MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Cosmopolitan.

Robertus lividus* (Blackwall, 1836) MATERIAL. 1♂ (2), 49.43319 N, 75.48624 E, aspen forest, pitfall-traps, 22-24.VIII.2025; 3♀ (1), 49.45195 N, 75.38371 E, pine forest in the floodplain of the creek, hand sorting, 12.VII.2015, leg. SMP. RANGE TYPE. Trans-Palaearctic — West-Nearctic.

***Steatoda albomaculata* (De Geer, 1778)** MATERIAL. 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 22.VIII.2025, leg. FDS. RANGE TYPE. Circum-Holarctic. Karaganda Region, near Barshino. 49.61666 N, 69.46666 E [19].

***Steatoda castanea* (Clerck, 1757)** MATERIAL. 1♂1♀ (4), 49.4291 N, 75.4782 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Trans-Eurasian.

Theridion varians* Hahn, 1833 MATERIAL. 3♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Trans-Palaearctic.

THOMISIDAE

***Ebrechtella tricuspidata* (Fabricius, 1775)** MATERIAL. 1 sub♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. INV, FAA. RANGE TYPE. Trans-Eurasian.

***Misumena vatia* (Clerck, 1757)** MATERIAL. 1 sub♀ (2), 49.43588 N, 75.48829 E, manual collection, 22-24.VIII.2025, leg PEV; 1♂ (2), 49.43588 N, 75.48829 E, manual collection, 22.VIII.2025, leg FDS; 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg FDS; 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg KLV. RANGE TYPE. Circum-Holarctic.

Ozyptila trux* (Blackwall, 1846) MATERIAL. 1 ♀ (2), 49.43781 N, 75.49352 E, birch forest, hand sorting, 23.VIII.2025. RANGE TYPE. Trans — Euro-Siberian.

***Spiracme striatipes* (L.Koch, 1870)** MATERIAL. 1 sub♂ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. INV, FAA; 1 sub♀ (1), 49.44476 N, 75.37503 E, abandoned cattle pen with ruderal vegetation, hand sorting, 10.VI.2025, leg. SMP; 1 sub♀ (1), 49.44384 N, 75.37603 E, planting poplar trees in the floodplain of the creek, hand sorting, 7.VI.2025, leg. SMP. RANGE TYPE. West-Central Ancient Mediterranean.

Xysticus cristatus* (Clerck, 1757) MATERIAL. 1♀ (1), 49.44994 N, 75.39511 E, manual collection, 11-14.VII.2025, leg. INV, FAA. RANGE TYPE. Trans-Palaearctic.

Xysticus viduus* Kulczyński, 1898 MATERIAL. 1♂ (2), 49.43319 N, 75.48624 E, aspen forest, pitfall-traps, 22-24.VIII.2025; 1♀ (2), 49.43588 N, 75.48829 E, manual collection, 23.VIII.2025, leg. KLV. RANGE TYPE. Euro — Middle-Siberian.

Individuals of the following genera were also found in the study area: *Lathys* Simon, 1884, *Drassodes* Westring, 1851, *Zelotes* Gistel, 1848, *Agyneta* Hull, 1911, *Palliduphantes* Saaristo & Tanasevitch, 2001, *Arctosa* Koch, 1847, *Tibellus* Simon, 1875, *Heliophanus* C.L. Koch, 1833, *Ipa* Saaristo, 2007, *Phylloneta* Archer, 1950. In addition, two species of harvestmen (Opiliones) were identified: *Opilio parietinus* (DeGeer, 1778) and *Phalangium opilio* Linnaeus, 1758.

A comparison with non-digitized literature and available GBIF data demonstrated that our collection significantly contributes to the knowledge of spider diversity in Central Kazakhstan. Five families (Clubionidae, Dolomedidae, Mimetidae, Miturgidae, and Tetragnathidae) and 40 species are reported for this region for the first time. For the area of the Karkaraly State National Natural Park only 2 species have previously been reported in the literature (Kent Mountains) [13, 14], as well as 10 species were available through GBIF portal (iNaturalist observations) [29].

We also found the differences in family composition between our results, non-digitized literature and GBIF data (Fig. 2A). The families Linyphiidae (19.2 %), Theridiidae (17.3 %), Lycosidae (13.5 %), Araneidae (11.5 %), and Thomisidae (11.5 %) were most abundant in our study. The diversity of families in the literature data was lower, and the Gnaphosid spiders were most represented. The high diversity of families in our study is explained by the use of different field collection methods (pitfall traps, hand sorting, manual collection) and the covering of various habitat types (plain and mountain forests, dry grasslands, steppes). Most spider occurrences from literature were collected in steppes using pitfall traps method [19]. For this habitat type Gnaphosid spider diversity is always high. The most diverse families in GBIF data were Araneidae (16 %), Salticidae and Thomisidae (14 %), Lycosidae and Theridiidae (10 %). This is an expected result because most of GBIF data about spiders in Central Kazakhstan derived from iNaturalist [20]. It is known that iNaturalist users most often record conspicuous species of plants and animals that can usually be identified from photographs [32]. In our study almost a half of observations registered through iNaturalist relate to *Argiope lobata* (Pallas, 1772), *Lycosa singoriensis* (Laxmann, 1770), *Thomisus onustus* Walckenaer, 1805, *Aculepeira armida* (Audouin, 1826), *A. diadematus*, *Larinioides ixobolus* (Thorell, 1873), and *Argiope bruennichi* (Scopoli, 1772). All these species are large and colourful spiders that are easily visible to the naked eye.

We have shown that our collection, non-digitized literature, and GBIF data make a comparable contribution to the overall species diversity of spiders in Central Kazakhstan (Fig. 2B). This result confirms the critical need to digitize and publish the literary heritage on the spiders of Kazakhstan through GBIF. According to "Bibliographia Araneologica Rossica 1770–2022" [33], more than 170 articles have been published on the diversity of spiders in Kazakhstan. But a huge amount of this data is still non-digitized and not available to researchers. The only known GBIF dataset of digitized literature covers the territory of the Balkhash-Alakol basin [34].

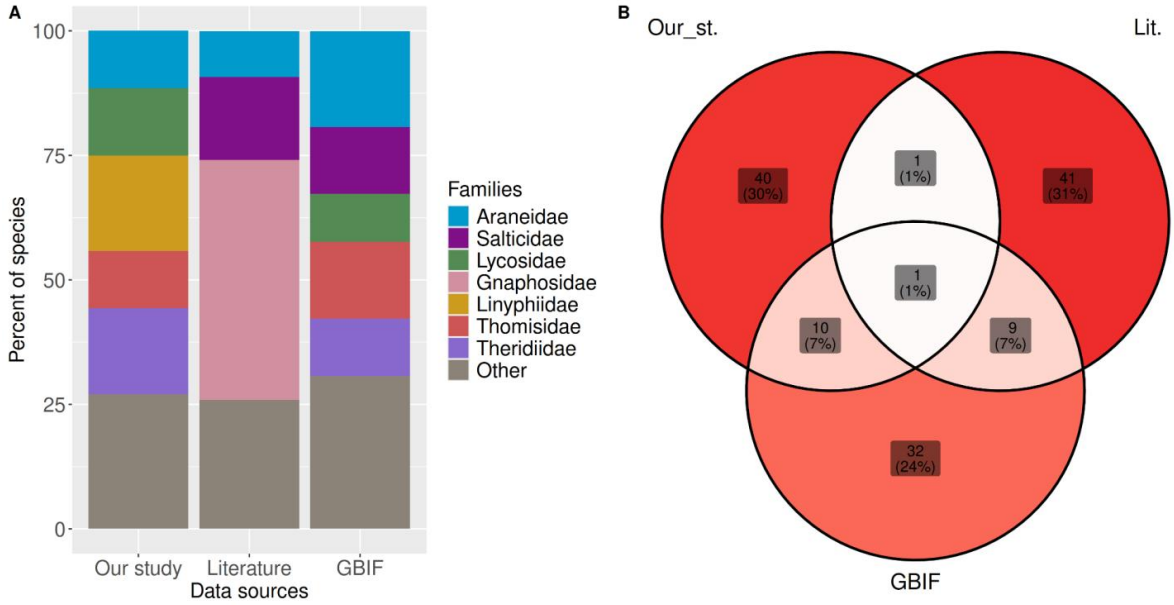

Figure 2. Taxonomic coverage on spider data of Central Kazakhstan.
A: the most represented spider families according to different data sources (Our study, non-digitized literature, GBIF),
B: Venn diagrams for species diversity based on three data sources (Our_st. – our study, Lit. – non-digitized literature, GBIF)

These results (Fig. 2B) also show that iNaturalist users and scientists collect different species. Combining these data sources provides more complete information about spider species diversity. At the same time, iNaturalist is limited in the number of species that can be identified, although observations have the widest spatial coverage among our data sources (Fig. 3). To fill the gap in the diversity of spiders in Kazakhstan on the GBIF digital map, large-scale field research and digitization of scientific heritage are required. These data will enable the building of more accurate models of biodiversity dynamics in the context of global climate change on a regional and global scale.

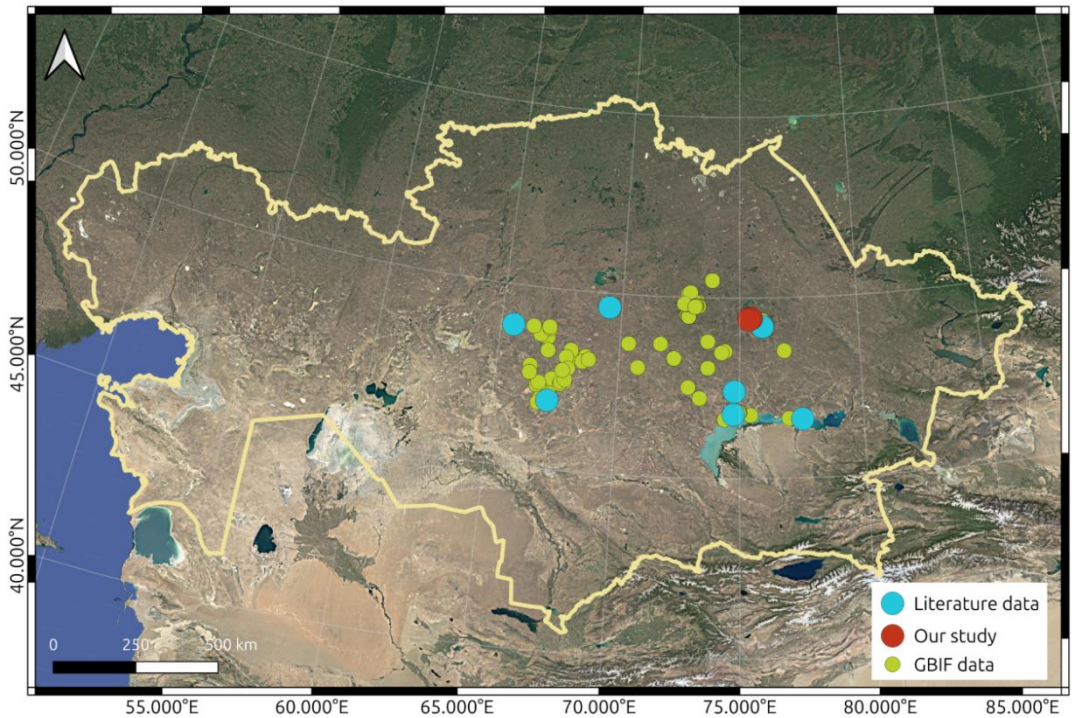

Figure 3. Spatial coverage of various data sources on spider data for Central Kazakhstan

Conclusion

As a result of the study, 52 species of spiders (order Araneae) were identified in the Karkaraly State National Natural Park. Among these 5 families and 40 species are recorded for Central Kazakhstan for the first time. The results of our local study have significantly expanded the GBIF digital data on spiders in Central Kazakhstan. Differences in species diversity identified by iNaturalist observations and scientific collection methods are shown.

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Author Contributions

The manuscript was written through contributions of all authors. All authors have given approval to the final version of the manuscript. CREDIT: **Plakkhina E.V. —** field data collection, data curation, data analysis, manuscript preparing; **Esyunin S.L. —** data identification, manuscript preparing; **Fetisov D.S. —** field data collection, data identification; **Kim L.V. —** field data collection, data identification; **Fedorova A.A. —** field data collection, manuscript preparing; **Ivanova N.V. —** GBIF datasets preparing and publishing, data analysis, manuscript preparing.

Conflict of Interest

The authors declare no conflict of interest.

References

1 Cameron E.K. Global mismatches in aboveground and belowground biodiversity / E.K. Cameron, I.S. Martins, P. Lavelle, et al. // Conservation Biology — 2019. — No. 33. — P. 1187–1192. https://doi.org/10.1111/cobi.13311

2 Potapov A.M. Global fine-resolution data on springtail abundance and community structure / A.M. Potapov, T. -W. Chen, A.V. Striuchkova et al. // Scientific Data. — 2024. — No. 11. — Article number: 63. https://doi.org/10.1038/s41597-023-02784-x

3 Schultheiss P. The abundance, biomass, and distribution of ants on Earth / P. Schultheiss, S.S. Nooten, R. Wang, et al. // PNAS. — 2022. — No. 119 (40). — e2201550119. https://doi.org/10.1073/pnas.2201550119

4 James S.W. Comment on "Global distribution of earthworm diversity" / S.W. James, C. Csuzdi, C.-H. Chang, et al. // Science. — 2021. — No. 371 (6525). — 1–3. https://doi.org/10.1126/science.abe4629

5 Ivanova N.V. Diversity of earthworm communities in the European part of Russia: field data and model estimations / N.V. Ivanova, M.P. Shashkov, S.A. Ermolov // Ecosystem Transformation. — 2025. — No. 8 (4). — 120–137. https://doi.org/10.23859/estr-240206

6 Kim L. On the jumping spider (Araneae, Salticidae) fauna of Almaty city (Republic of Kazakhstan) / L. Kim, M. Salmenova, A. Yeszhanov // Bulletin of the Karaganda University. Biology, Medicine, Geography Series. — 2023. — No. 3(111). — P. 99–104. https://doi.org/10.31489/2023BMG3/99-104

7 Nekhaeva A. New data on the spider fauna (Arachnida: Aranei) of the East Kyzylkum Desert, Kazakhstan / A. Nekhaeva, L. Kim, A. Yeszhanov // Arthropoda Selecta. — 2024. — No. 33 (3). — P. 431–444. https://doi.org/10.15298/arthsel.33.3.08

8 Esyunin S.L. New data on the spider (Arachnida: Aranei) fauna of Mangystau Oblast, Kazakhstan / S.L. Esyunin, V.E. Efimik, A.N. Nekhaeva et al. // Arthropoda Selecta. — 2025. — No. 34 (3). — 426–446. https://doi.org/10.15298/arthsel.34.3.15

9 Logunov D.V. Spiders of Kazakhstan / D.V. Logunov, A.V. Gromov // Manchester: Siri Scientific Press. — 2012. — 232 p.

10 Овчаренко В.Н. Систематический список пауков сем. Gnaphosidae (Aranei) европейской части СССР и Кавказа / В.Н. Овчаренко // Энтомологическое обозрение. — 1982. — № 61 (4). — С. 830–844.

11 Марусик Ю.М. Каталог пауков-кругопрядов Казахстана. Семейство Araneidae / Ю.М. Марусик, Ч.К. Тарабаев, А.М. Литовченко // Известия АН КазССР. Серия биологическая. — 1990. — № 4. — С. 14–23.

12 Marusik Yu.M. The crab spiders of Middle Asia, USSR (Aranei, Thomisidae). 1. Descriptions and notes on distribution of some species / Yu.M. Marusik, D.V. Logunov // Korean Arachnology. — 1990. — № 6 (1). — C. 31–62.

13 Ovtsharenko V.I. A review of the North Asian ground spiders of the genus *Gnaphosa* (Araneae, Gnaphosidae) / V.I. Ovtsharenko, N.I. Platnick, D.X. Song // Bulletin of the American museum of natural history. — New York: American Museum of Natural History. — 1992. — 88 p.

14 Lyakhov O.V. Contribution to the Middle Asian fauna of the spider genus *Thanatus* C.L. Koch, 1837 (Aranei: Philodromidae) / O.V. Lyakhov // Arthropoda Selecta. — 2000. — No. 8(4). — 221–230.

15 Azarkina G.N. New and poorly known Palaearctic species of the genus *Phlegra* Simon, 1876 (Araneae, Salticidae) / G.N. Azarkina // Review Arachnology. — 2003. — No. 14 (6). — 73–108.

16 Громов А.В. Интересные находки пауков (Arachnida: Aranei) в Центральном Казахстане / А.В. Громов // Зоологические исследования за 20 лет независимости Республики Казахстан: Материалы Международной научной конференции посвященной 20-летию независимости Республики Казахстан (22-23 сентября). — Алматы: РГП Институт зоологии, 2011. — С. 70–75.

17 Marusik Yu.M. Redescription of *Asagena semideserta* (Ponomarev, 2005) comb. n. (Araneae: Theridiidae) / Yu. M. Marusik, A.A. Fomichev, T.K. Tuneva // Acta Zoologica Bulgarica. — 2016. — No. 68 (4). — P. 477–482.

18 Esyunin S.L. A review of the family Gnaphosidae in the fauna of the Urals (Aranei), 6. Taxonomic remarks and new records, with description of a new species / S.L. Esyunin, T.K. Tuneva // Arthropoda Selecta. — 2020. — No. 29 (1). — 103–120.

19 Триликаускас Л.А. Распределение пауков (Arachnida: Araneae) в зонально-катенной матрице степей Центрального Казахстана / Л.А. Триликаускас, И.И. Любечанский // Сибирский экологический журнал. — 2020. — № 5. — С. 587–599. https://doi.org/10.15372/SEJ20200503

20 GBIF.org. Spiders of Central Kazakhstan (01 December 2025). GBIF Occurrence Download. — [Electronic resource]. — 2025. — Access mode: https://www.gbif.org. (Date of request: 01.12.2025).

21 Максутова П.А. Физическая география Карагандинской области / П.А. Максутова, Ш.Е. Дюсекеева, А.О. Кулмаганбетова. — Караганда: Изд-во КарГУ. — 2005. — 59 с.

22 Погода и климат. — [Электронный ресурс]. — Режим доступа: www.pogodaiklimat.ru (дата обращения: 05.12.2025).

23 World Spider Catalog. Version 26. — [Electronic resource]. — Natural History Museum Bern, 2025. — Access mode: http://wsc.nmbe.ch (Date of request: 03.12.2025). https://doi.org/10.24436/2

24 Polchaninova N. Catalogue of the spiders (Arachnida, Aranei) of Left-Bank Ukraine / N. Polchaninova, E. Prokopenko // Arthropoda Selecta. — 2013. — No. 23. — 1–268.

25 Sozontov A. Spiders of the Udmurt Republic: fauna, ecology, phenology and distribution / A. Sozontov, S. Esyunin. — Moscow: KMK Scientific Press. — 2022. — 285 p.

26 Shashkov M.P. Invertebrates from the Kendara Valley (Karkaraly National Park, Kazakhstan). Version 1.1. / M.P. Shashkov, N.V. Ivanova, A. Fedorova, et al. Occurrence dataset. — Karaganda Buketov University. — 2025. https://doi.org/10.15468/3z7x4u (Date of request: 17.11.2025).

27 Shashkov M. Soil invertebrates collected during the IX Field School on Soil Zoology and Ecology for Young Scientists (Karkaraly National Park, Kazakhstan). Version 1.8. / M. Shashkov, K. Gongalsky, N. Ivanova, et al. Occurrence dataset. — Karaganda Buketov University. — 2025. https://doi.org/10.15468/7qurj7 (Date of request: 14.11.2025).

28 GBIF.org. Checklist of spiders in Central Kazakhstan (01 December 2025). GBIF Occurrence Download. — 2025. https://doi.org/10.15468/dl.t8t8ay (Date of request: 01.12.2025).

29 GBIF.org. Checklist of spiders in Karkaraly National Park (01 December 2025). GBIF Occurrence Download. — 2025. — https://doi.org/10.15468/dl.hs29pc (Date of request: 01.12.2025).

30 R Core Team. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. — 2025. — [Electronic resource]. — Access mode: https://www.R-project.org/

31 Gao C-H. ggVennDiagram: Intuitive Venn diagram software extended / C-H. Gao, C. Chen, T. Akyol, et al. // iMeta. — No. 3 (1). — e177. Access mode: https://doi.org/10.1002/imt2.177

32 Hochmair H.H. Evaluating the data quality of iNaturalist termite records / H.H. Hochmair, R.H. Scheffrahn, M. Basille, M. Boone // PLoS ONE. — 2020. — № 15 (5). — e0226534. — Access mode: https://doi.org/10.1371/journal.pone.0226534

33 Михайлов К.Г. Bibliographia Araneologica Rossica 1770–2022. Библиография по паукам России и республик бывшего СССР, 1770–2022 / К.Г. Михайлов // Зоологические исследования. — 2024. — № 22. — 227 с. — Москва: КМК.

34 Nekhaeva A. Spider (Arachnida, Araneae) fauna of the lowland part of the Balkhash–Alakol basin (SE Kazakhstan). Part 1: Literature data. Version 1.8. / A. Nekhaeva, L. Kim, A. Ishaeva, A. Sozontov Occurrence dataset. — Institute of Zoology of the Republic of Kazakhstan. — 2025. https://doi.org/10.15468/7qrc2k (Date of request: 03.12.2025).

Е.В. Плакхина, С.Л. Есюнин, Д.С. Фетисов, Л.В. Ким, А.А. Федорова, Н.В. Иванова

«Қарқаралы» Мемлекеттік ұлттық табиғи паркінің өрмекшілер фаунасы (Arachnida: Araneae) туралы алғашқы ғылыми мәліметтер: Орталық Қазақстан бойынша деректерді толықтыру

Мақалада Қазақстанның Қарағанды облысында орналасқан «Қарқаралы» Мемлекеттік ұлттық табиғи паркі өрмекшілерінің (Araneae отряды) алуан түрлілігі жөніндегі алғашқы ғылыми деректер келтірілген. Далалық материал Кендара аңғарында, Шайтанкөл көлінің маңында және академик Е.А. Бөкетов атындағы Қарағанды ұлттық зерттеу университетінің далалық практика базасында 2025

жылдың шілде–тамыз айларында сызықты тұзақтар, топырақ үлгілерін талдау және қолмен жинау әдістері арқылы жиналды. Барлығы 52 өрмекші түрі анықталды, олардың 40 түрі мен 5 тұқымдасы GBIF жаһанды биоалуантүрлілік жүйесінің деректері мен цифрландырылмаған әдеби мәліметтерге сәйкес Орталық Қазақстан үшін алғаш рет тіркеліп отыр. Алынған нәтижелер Орталық Қазақстандағы Araneae отряды өкілдерінің түр құрамына қатысты GBIF арқылы қолжетімді мәліметтерді едәуір толықтырды. iNaturalist қосымшасы арқылы тіркелген түрлік әртүрлілік пен дәстүрлі далалық тәсілдер арқылы жиналған материалдар негізіндегі мәліметтер арасында айырмашылықтар анықталды. Орталық Қазақстанның өрмекшілерін ауқымды далалық зерттеулердің қажеттілігі, сондай-ақ әдебиетте жарияланған деректерді цифрландыру және оларды GBIF порталы арқылы қолжетімді ету қажеттігі туралы қорытынды жасалды.

Кілт сөздер: өрмекшілер, Орталық Қазақстан, Қарағанды облысы, GBIF, iNaturalist.

Е.В. Плакхина, С.Л. Есюнин, Д.С. Фетисов, Л.В. Ким, А.А. Федорова, Н.В. Иванова

Первые сведения о фауне пауков (Arachnida: Araneae) Каркаралинского государственного национального природного парка: расширение данных по Центральному Казахстану

В работе представлены первые научные данные о разнообразии пауков (отряд Araneae) Каркаралинского государственного национального природного парка (Казахстан, Карагандинская область). Полевой материал собран в долине Кендара, в окрестностях озера Шайтанколь и на базе проведения полевых практик Карагандинского национального исследовательского университета имени академика Е.А. Букетова методами линий ловушек, разбора почвенных проб и ручного сбора в июле и августе 2025 г. Идентифицировано 52 вида пауков; 40 видов и 5 семейств впервые приводятся для Центрального Казахстана согласно глобальной системе о биоразнообразии GBIF и неоцифрованным литературным данным. Полученные результаты существенно расширили доступные через GBIF сведения о видовом составе представителей отряда Araneae в Центральном Казахстане. Выявлены различия в видовом разнообразии, регистрируемом через приложение iNaturalist и на основе сборов традиционными полевыми методами. Сделан вывод о необходимости масштабных полевых исследований пауков Центрального Казахстана, а также оцифровки и публикации через портал GBIF опубликованных в литературе данных.

Ключевые слова: пауки, Центральный Казахстан, Карагандинская область, GBIF, iNaturalist.

References

1 Cameron, E.K., Martins, I.S., Lavelle, P., et al. (2019). Global mismatches in aboveground and belowground biodiversity. *Conservation Biology*, 33, 1187–1192. https://doi.org/10.1111/cobi.13311

2 Potapov, A.M., Chen, T.-W., Striuchkova, A.V., et al. (2024). Global fine-resolution data on springtail abundance and community structure. *Scientific Data*, 11, Article number: 63. https://doi.org/10.1038/s41597-023-02784-x

3 Schultheiss, P., Nooten, S.S., Wang, R., et al. (2022). The abundance, biomass, and distribution of ants on Earth. *PNAS*, 119(40), e2201550119. https://doi.org/10.1073/pnas.2201550119

4 James, S.W., Csuzdi, C., Chang, C.-H., et al. (2021). Comment on "Global distribution of earthworm diversity". *Science*, 371(6525), 1–3. https://doi.org/10.1126/science.abe4629

5 Ivanova, N.V., Shashkov, M.P., & Ermolov, S.A. (2025). Diversity of earthworm communities in the European part of Russia: field data and model estimations. *Ecosystem Transformation*, 8(4), 120–137. https://doi.org/10.23859/estr-240206

6 Kim, L., Salmenova, M., & Yeszhanov, A. (2023). On the jumping spider (Araneae, Salticidae) fauna of Almaty city (Republic of Kazakhstan). *Bulletin of the Karaganda University. Biology, Medicine, Geography Series*, 3(111), 99–104. https://doi.org/10.31489/2023BMG3/99-104

7 Nekhaeva, A., Kim, L., & Yeszhanov, A. (2024). New data on the spider fauna (Arachnida: Aranei) of the East Kyzylkum Desert, Kazakhstan. *Arthropoda Selecta*, 33(3), 431–444. https://doi.org/10.15298/arthsel.33.3.08

8 Esyunin, S.L., Efimik, V.E., Nekhaeva, A.N., et al. (2025). New data on the spider (Arachnida: Aranei) fauna of Mangystau Oblast, Kazakhstan. *Arthropoda Selecta*, 34(3), 426–446. https://doi.org/10.15298/arthsel.34.3.15

9 Logunov, D.V., & Gromov A.V. (2012). *Spiders of Kazakhstan.* Manchester: Siri Scientific Press.

10 Ovcharenko, V.N. (1982). Sistematicheskii spisok paukov semeistva Gnaphosidae (Aranei) evropeiskoi chasti SSSR i Kavkaza [A systemathic list of spiders of the family Gnaphosidae (Aranei) on the European part of the USSR and the Caucasus]. *Entomologicheskoe obozrenie — Entomological review*, 61(4), 830–844 [in Russian].

11 Marusik, Yu.M., Tarabaev, Ch.K., & Litovchenko, A.M. (1990). Katalog paukov-krugopriadov Kazakhstana. Semeistvo Araneidae [Catalog of orb-weaving spiders of Kazakhstan, family Araneidae]. *Izvestiia Akademii Nauk KazSSR. Seriia biologicheskaia — News of the Academy of Sciences of the Kazakh SSR. Biological series*, 4, 14–23 [in Russian].

12 Marusik, Yu.M., & Logunov, D.V. (1990). The crab spiders of Middle Asia, USSR (Aranei, Thomisidae). 1. Descriptions and notes on distribution of some species. *Korean Arachnology*, 6(1), 31–62.

13 Ovtsharenko, V.I. Platnick, N.I., & Song, D.X. (1992). A review of the North Asian ground spiders of the genus *Gnaphosa* (Araneae, Gnaphosidae). *Bulletin of the American museum of natural history*, 88 p. New York: American Museum of Natural History.

14 Lyakhov, O.V. (2000). Contribution to the Middle Asian fauna of the spider genus *Thanatus* C.L. Koch, 1837 (Aranei: Philodromidae). *Arthropoda Selecta*, 8(4), 221–230.

15 Azarkina, G.N. (2003). New and poorly known Palaearctic species of the genus *Phlegra* Simon, 1876 (Araneae, Salticidae). *Revue Arachnologique*, 14(6), 73–108.

16 Gromov, A.V. (2011). Interesnye nakhodki paukov (Arachnida: Aranei) v Tsentralnom Kazakhstane [Interesting spiders finds (Arachnida: Aranei) in central Kazakhstan]. *Zoologicheskie issledovaniia za 20 let nezavisimosti Respubliki Kazakhstan: Materialy Mezhdunarodnoi nauchnoi konferentsii, posviashchennoi 20-letiiu nezavisimosti Respubliki Kazakhstan — Zoological research over 20 years of independence of the Republic of Kazakhstan: Proceedings of the International Scientific Conference dedicated to the 20th anniversary of Independence of the Republic of Kazakhstan* (pp. 70–75). Almaty: Institut zoologii [in Russian].

17 Marusik, Yu.M., Fomichev, A.A., & Tuneva, T.K. (2016). Redescription of Asagena semideserta (Ponomarev, 2005) comb. n. (Araneae: Theridiidae). *Acta Zoologica Bulgarica*, 68(4), 477–482.

18 Esyunin, S.L., & Tuneva, T.K. (2020). A review of the family Gnaphosidae in the fauna of the Urals (Aranei), 6. Taxonomic remarks and new records, with description of a new species. *Arthropoda Selecta*, 29(1), 103–120.

19 Trilikauskas, L.A., & Liubechanskii, I.I. (2020). Raspredelenie paukov (Arachnida: Araneae) v zonalno-katennoi matritse stepei Tsentralnogo Kazakhstana [Distribution of spider (Arachnida: Araneae) in the zonal-catenary matrix of the steppes of central Kazakhstan]. *Sibirskii ekologicheskii zhurnal — Siberian Ecological Journal*, 5, 587–599. https://doi.org/10.15372/SEJ20200503 [in Russian].

20 GBIF.org. *Spiders of Central Kazakhstan* (01 December 2025). GBIF Occurrence Download. Retrieved from https://doi.org/10.15468/dl.h7chuv (accessed 01 December 2025).

21 Maksutova, P.A., Dyusekeeva, Sh.E., & Kulmagambetova, A.O. (2005). *Fizicheskaia geografiia Karagandinskoi oblasti* [Physical geography of the Karaganda region]. Karaganda: Izdatelstvo Karagandinskogo gosudarstvennogo universiteta [in Russian].

22 (2025). Pogoda i klimat [Weather and Climate]. *www.pogodaiklimat.ru.* Retrieved from www.pogodaiklimat.ru (accessed 05 December 2025) [in Russian].

23 (2025). World Spider Catalog. Version 26. Natural History Museum Bern. http:*wsc.nmbe.ch.* Retrieved from http://wsc.nmbe.ch (accessed 03 December 2025). https://doi.org/10.24436/2

24 Polchaninova, N., & Prokopenko, E. (2013). Catalogue of the spiders (Arachnida, Aranei) of Left-Bank Ukraine. *Arthropoda Selecta*, 23, 1–268.

25 Sozontov, A., & Esyunin, S. (2022). *Spiders of the Udmurt Republic: fauna, ecology, phenology and distribution*. Moscow: KMK Scientific Press, 285 p.

26 Shashkov, M.P., Ivanova, N.V., Fedorova, A., et al. (2025). *Invertebrates from the Kendara Valley (Karkaraly National Park, Kazakhstan), Version 1.1*. Occurrence dataset. Karaganda Buketov University. https://doi.org/10.15468/3z7x4u (accessed 17 November 2025).

27 Shashkov, M., Gongalsky, K., Ivanova, N., et al. (2025). *Soil invertebrates collected during the IX Field School on Soil Zoology and Ecology for Young Scientists (Karkaraly National Park, Kazakhstan), Version 1.8.* Occurrence dataset. Karaganda Buketov University. https://doi.org/10.15468/7qurj7 (accessed 14 November 2025).

28 GBIF.org. Checklist of spiders in Central Kazakhstan (01 December 2025). GBIF Occurrence Download. https://doi.org/10.15468/dl.t8t8ay (accessed 01 December 2025).

29 GBIF.org. Checklist of spiders in Karkaraly National Park (01 December 2025). GBIF Occurrence Download. https://doi.org/10.15468/dl.hs29pc (accessed 01 December 2025).

30 R Core Team. (2025). *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/

31 Gao, C.-H., Chen, C., Akyol, T., et al. (2024). *ggVennDiagram*: Intuitive Venn diagram software extended. *iMeta*, 3(1), e177. https://doi.org/10.1002/imt2.177

32 Hochmair, H.H., Scheffrahn, R.H., Basille, M., & Boone, M. (2020). Evaluating the data quality of iNaturalist termite records. *PLoS ONE*, 15(5), e0226534. https://doi.org/10.1371/journal.pone.0226534

33 Mikhailov, K.G. (2024). Bibliographia Araneologica Rossica 1770–2022. Bibliografiia po paukam Rossii i respublik byvshego SSSR, 1770–2022 [Bibliography on spiders of Russia and the republics of the former USSR, 1770-2022]. *Zoologicheskie issledovaniia — Zoological research*, 22, 227. Moscow [in Russian].

34 Nekhaeva, A., Kim, L., Ishaeva, A., & Sozontov A. (2025). *Spider (Arachnida, Araneae) fauna of the lowland part of the Balkhash–Alakol basin (SE Kazakhstan). Part 1: Literature data. Version 1.8.* Occurrence dataset. Institute of Zoology of the Republic of Kazakhstan. https://doi.org/10.15468/7qrc2k (accessed 03 December 2025).

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