



## NUROTA TOG‘ TIZMASI ENDEM TURLARINING TO‘R TIZIMLI XARITASI.

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**Annotatsiya** O‘zbekiston Respublikasining Jizzax viloyatiga olib borilgan dala tadqiqotlar mobaynida 32 ta endem turiga oid ma’lumotlar hamda gerbariylar to‘plandi. Ushbu maqolada yuqoridagi ma’lumotlardan foydalanib, Nuratau tog‘ tizmasidagi endem turlarning to‘r tizimli xaritasi shakllantirildi.

**Kalit so‘zlar.** Endem turlar, Nuratau tog‘ tizmasi, Nuratau provinsiyasi, dala tadqiqoti, to‘r tizimli xarita.

**Abstract** During the field research conducted in the Dzhizak region of the Republic of Uzbekistan, information on 32 endemic species and herbariums were collected. In this article, using the above information, a grid system map of endemic species in the Nuratau mountain range was formed.

**Keywords.** Endemic species, Nuratau mountain range, Nuratau province, field survey, grid systematic map.

**Аннотация** В ходе полевых исследований, проведенных в Джизакской области Республики Узбекистан, собрана информация о 32 эндемичных видах и гербариях. В данной статье с использованием приведенной выше информации была сформирована сеточная карта эндемичных видов Нуратинского горного хребта.

**Ключевые слова.** Эндемичные виды, Нуротинский горный массив, Нуратинская область, полевые исследования, карта-сетка.

### Introduction

It includes 32 species of endemic species in Nuratau district of Uzbekistan [1,2,6]. Endemic species usually have higher risk of extinction than widespread species. The Nuratau Mountains, located in Uzbekistan, are rich in endemic species and are a part of the Mountains of Central Asia Global Biodiversity Hotspot and one of Key Biodiversity Areas[1]. The Dzhizak Province is a large administrative region of the Republic of Uzbekistan located in the central part of the country, between two large rivers, Syrdarya and Zeravschan. The territory of the Dzhizak Province (DP) is divided into two physiographical parts. The northern plain part

includes the Kyzylkum Desert, the Aydar-Arnasay lake system, and the Hungry Steppe depression in the middle reaches of the Syrdarya River. The southern mountainous part includes Turkestan Range and its western spurs, Malguzar and Nuratau mountains. The highest and lowest points are 4029 m and 240 m above sea level, respectively[2]. The Nuratau Mountains are spread over 250 km in the sub-latitudinal direction along the right bank of the Zeravschan River, embracing an area of ca. 14,000 km<sup>2</sup>. There are two parallel medium-altitude mountain ranges, Nuratau in the north and Aktau in the south, separated by an intermountain depression (the Nuratau valley) and several peripheral low mountains[3].

The grid system map shows how many species grow in grids (each cell is indexed) at a horizontal and vertical distance of 5 kilometers in a given area. The grid system map shows how many species grow in horizontal and vertical 5 km cells (each cell is indexed) in a given area and the species density in a 5x5 width - Species Richness (SR) and samples collected from species - Collection Density (CD) shows[5,6]. The purpose of researching Nuratau Mountain and writing this article is:

- forming a grid map of the Nuratau mountain range;
- determining how many species grow in each cell of the grid system map;
- to collect samples and information about them for future research.

### Materials and Methods

The “Red Boo” of the Republic of Uzbekistan was used to determine the rarity level of the species [7]. The distribution of species within the Dzhizak region is shown in accordance with the botanical-geographical zoning scheme used in the new edition of “Flora of Uzbekistan”[6]. In the course of field research conducted in 2024, herbarium specimens of the species were taken from the known regions of the Republic of Uzbekistan and submitted to the National Herbarium of Uzbekistan (TASH) for preservation. Plants of the World Online (<https://powo.science.kew.org/>) was used to determine the accepted species names of plants [8]. Online platforms such as Global Biodiversity Information Facility (GBIF, [www.gbif.org](http://www.gbif.org)) [9], plantarium.ru [10], INaturalist [11] were also involved. The samples were georeferenced using Google Earth Pro 7.1 software. The data collected during the field research were created as data files in Excel format. The grid system maps of the geographical distribution of each endemic species were made using ArcGIS 10.8 software.

### Results and Discussion

In 2024, field research was carried out in Dzhizak region, located in the center of Uzbekistan, to study endemic species in Nuratau district. During the research, georeference information, herbariums and their photo illustrations of 32 endemic species of plants were collected, and 9 of them were included in the “Red Book” of the Republic of Uzbekistan (Table 1). The grid system map of the Nuratau mountain range was made from the information about the Nuratau district (Figure 1). Each cell on the map is 5 km along the vertical and horizontal area. The territory of Uzbekistan is divided into 19 240 cells of a 5 × 5 km grid (each cell is indexed). 713 of these cells (each cell is indexed) are located in Nuratau

district. Based on the coordinates of the herbarium samples taken and recorded, how many species growth (species

Species	FP1	FP2	OR	SRB
<i>Acantholimon nuratavicum</i> Zakirov	July	August	6	2
<i>Acantholimon subavenaceum</i> Lincz.	June	July- August	3	2
<i>Acantolimon zakirovii</i> Beshko	June	July- August	6	-
<i>Allium aktauense</i> F.O. Khass. & Esankulov	May	May- June	1	-
<i>Allium habibii</i> F.O. Khass.	May	June- July	1	-
<i>Allium svetlanae</i> Vved. Ex Filim.	June	July	3	-
<i>Arctium pallidivirens</i> (Kult.) S. Lopez, Romanschenko, Susanna & N. Garcia	June	July	28	-
<i>Astragalus nuratensis</i> Popov	May	July- August	4	1
<i>Astragalus saidii</i> F.O.Khass. & Esankulov	June	July- August	1	-
<i>Autumnalia innopinata</i> Pimenov	May	August	10	-
<i>Cousinia botschantzevii</i> Juz. ex Tscherneva	May	August	28	-
<i>Cousinia pseudolanata</i> Popov ex Tscherneva	June	August	3	-
<i>Dianthus helenae</i> Vved.	June	July- August	22	-
<i>Dracocephalum nuratavicum</i> Adylov	June	August	16	-
<i>Eremurus nuratavicus</i> Khohkr.	May- June	July- August	2	-
<i>Ferula helenae</i> Rakhmankulov & Melibaev	May	August	8	2
<i>Ferula nuratavica</i> Pimenov	July	July- August	6	-

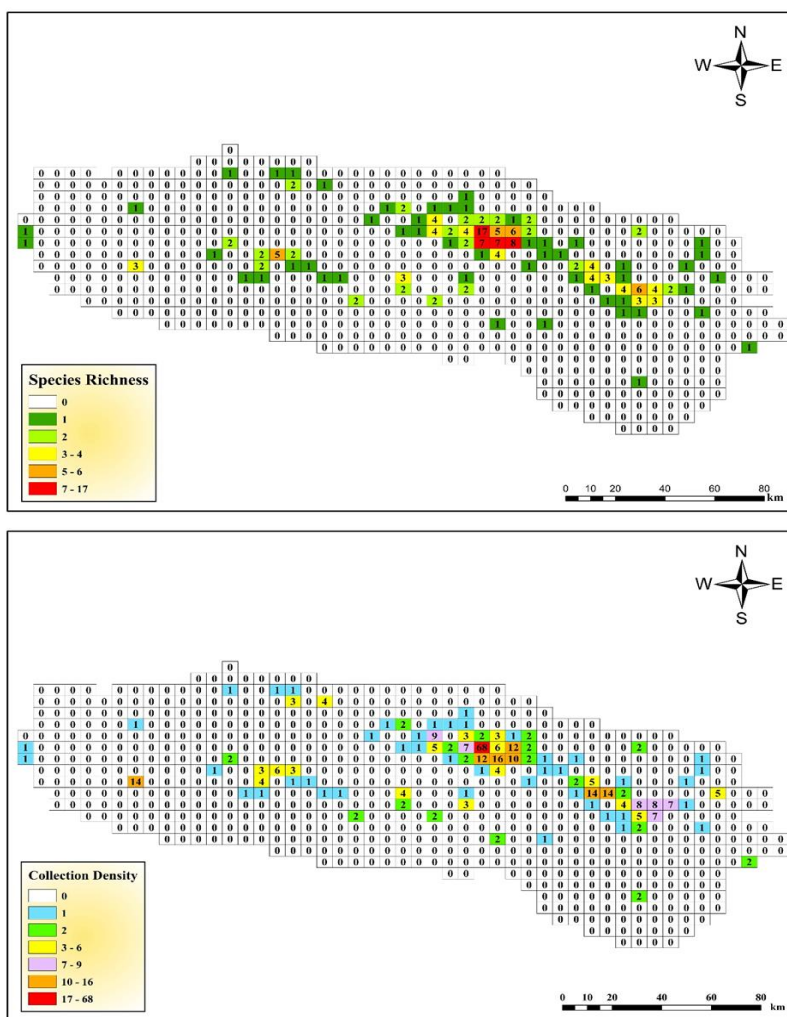
<i>Helichrysum nuratavicum</i> Krasch.	July	August-Sep	9	2
<i>Iris hippolyti</i> (Vved.) Kamelin	April-May	August	10	1
<i>Jurinea zakirovii</i> Iljin	May	July-August	5	-
<i>Lagochilus olgae</i> Kamelin	June	August	13	2
<i>Lagochilus proskorjakovii</i> Ikramov	June	July-August	5	1
<i>Lappula nuratavica</i> Nabiev & Zakirov	June	August-Sep	3	-
<i>Lepidium olgae</i> (R.M.Vinogr.) Al-Shehbaz & Mumm.	May	August	8	-
<i>Oxytropis pseudorosea</i> Filim.	June	July-August	36	-
<i>Parrya nuratensis</i> Botsch. & Vved.	May	July-August	14	-
<i>Phlomis nubilans</i> Zakirov	June	August	66	-
<i>Phlomoides anisochila</i> (Pazij & Vved.) Salmaki	June	August-Sep	19	-
<i>Salvia submutica</i> Botsch. & Vved.	June	July-August	26	2
<i>Silene nuratavica</i> Kamelin	May	July-August	1	-
<i>Thymus subnervosus</i> Vved., Nabiev & Tulyag.	May-June	August-Sep	1	-
<i>Vicoa krascheninnikovii</i> Kamelin	June	July-August	1	-

density - Species Richness) was determined in each indexed area. It was found that 17 species

are distributed in the area of BU189 index (Lat: 40.493183 Long: 66.729565). It was found that

at least 1 species of endemic species grows in remote parts of Nuratau district.

**Table 1.** FP1- flowering period, FP2 – fruiting period, OR - occurrence records, SRB - Status in the Red Book in Uzbekistan.



**Figure 1.** A) SR - Species Richness of 32 endemic species distributed in Nuratau district, how many species increase in each index, B) CD - Collected Density, specimens collected from species in each index.

## Conclusions

The following conclusions were made by studying 32 endemic species of Nuratau district:

- Endemic species have a higher risk of extinction than other common species. Therefore, protection measures should be taken in areas where endemic species are spread.
- It was found that the largest number of endemic species grow in the territory of the Nuratau State Reserve or in the nearby areas.
- The fact that 9 of the 32 studied endemic species are on the red list is another proof that they are at a higher risk of extinction than other widespread species.
- Information obtained during field research will serve as an important source for further research in the future. For example: molecular scientific-practical work can be done on endemic species.

### References

1. Sergei Volis, Natalya Beshko “How to preserve narrow endemics in view of climate change? The Nuratau Mountains as the case” – 2023. <https://doi.org/10.21203/rs.3.rs-2816831/v1>
2. [Tojibaev Komiljon, Beshko Natalya, Botashov Avazbek, Azimova Dilnoza, Yusupov Ziyoviddin, Tao Deng, Hang Sun - “Flora of the Dzhizak province, Uzbekistan” China forestry publishing house – 2020.](#)
3. N.Yu.Beshko – “Flora of Central Asia: The Nuratau Mountains”. Kore National Arboretum of the Korea Forest Service – 2020.
4. [Tojibaev K.Sh., Botashov A.R., Qodirov U.H., Akbarov F.I. - Systematic mapping of flora composition of Uzbekistan: preliminary results and prospects for development// scientific bulletin of NamSU. Namangan 2020. Special issue - 111-116 B.](#)
5. Tojibaev, K., Khassanov, F., Turginov, O., Akbarov, F., Pulatov, S., Turdiboev, O. (2022) – “Endemic plant species richness of Surkhondaryo province, Uzbekistan” // Plant Diversity of Central Asia. 1. 71–84.
6. K.Sh. Tojibaev, N.Yu. Beshko, V.A. Popov – “Botanical-geographical regionalization of Uzbekistan” Tashkent-2016.
7. [“The Red Data Book of the Republic of Uzbekistan” - in 2 volumes Volume I.](#)
8. Plants of the World Online - <https://powo.science.kew.org/>
9. Global Biodiversity Information Facility (GBIF)  
[https://www.gbif.org/species/3148323.](https://www.gbif.org/species/3148323)
10. <https://www.plantarium.ru/>
11. INaturalist (<https://www.inaturalist.org/>)