



THE SPECIES JURINEA ZAKIROVII, HELICHRYSUM NURATAVICUM AND OXYTROPIS PSEUDOROSEA WHOSE NATURAL POPULATIONS ARE EXPANDING IN THE NUROTA BOTANICAL-GEOGRAPHICAL DISTRICT

Dilnoza Azimova Ergashevna
Jizzakh State Pedagogical University

Abstract

The article presents information about the species *Jurinea zakirovii*, *Helichrysum nuratavicum* and *Oxytropis pseudorosea* whose natural populations are expanding in the Nurota botanical-geographical district.

Keywords: Herbarium, illustration, TASH database, endemic species, morphological characters, botanical-geographical district.

Annotatsiya

Maqolada Nurota botanika-geografik okrugida tabiiy populyatsiyalari kengayib borayotgan *Jurinea zakirovii*, *Helichrysum nuratavicum* va *Oxytropis pseudorosea* turlari haqida ma'lumotlar keltirilgan.

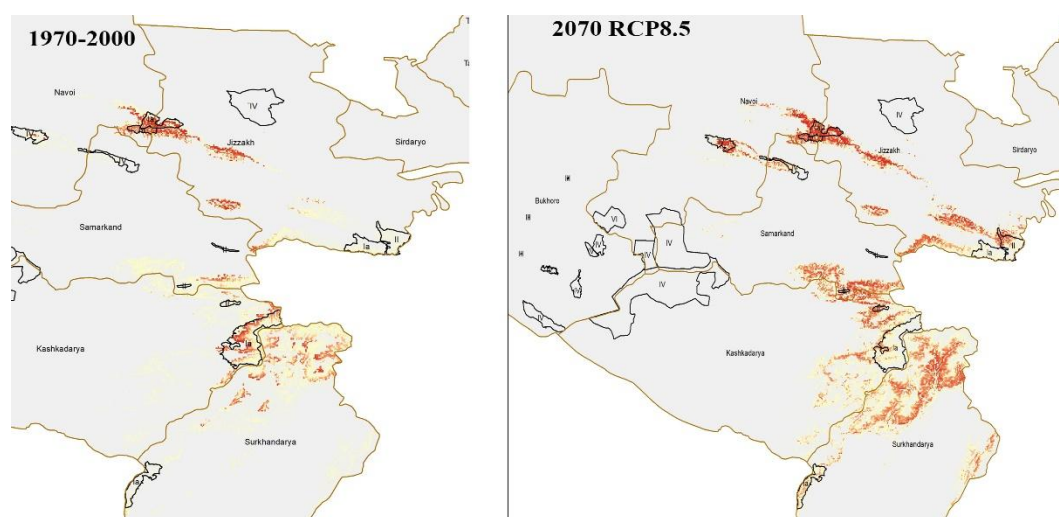
Kalit so'zlar. Gerbariy, illyustratsiya, TASH ba'zasi, endem turlar, morfologik belgilar, botanik-geografik rayon.

Distribution of *Jurinea zakirovii* 1970–2000 (left map): The main habitats of the species are located in the Jizzakh, Samarkand, Kashkadarya and Surkhandarya regions. The most suitable areas are marked in red and yellow, and are located on mountain slopes and in dry steppe areas. The distribution is relatively limited, with individual populations scattered in separate areas.

Projections for the 2070 RCP8.5 scenario (right map): The species' range has expanded significantly, especially in Surkhandarya and Kashkadarya regions, where suitable habitats have increased. The distribution has also increased in the Jizzakh and Navoi regions, which indicates that the species will also have suitable areas in

the northern direction. When the main ecological factors affecting the distribution of this species were modeled for the years 1970–2000 and 2070 (RCP8.5 scenario), it was found that the factors BIO4 (temperature seasonality) and BIO7 (annual temperature range), as well as the factors Slope1 (slope $0.5\% \leq 2\%$) and Slope7 (slope $30\% \leq 45\%$) played a very significant role. These factors are important in shaping the distribution of the species, and they made a high contribution. According to the model results, these factors remained unchanged in 2070, shaping the species' living conditions.

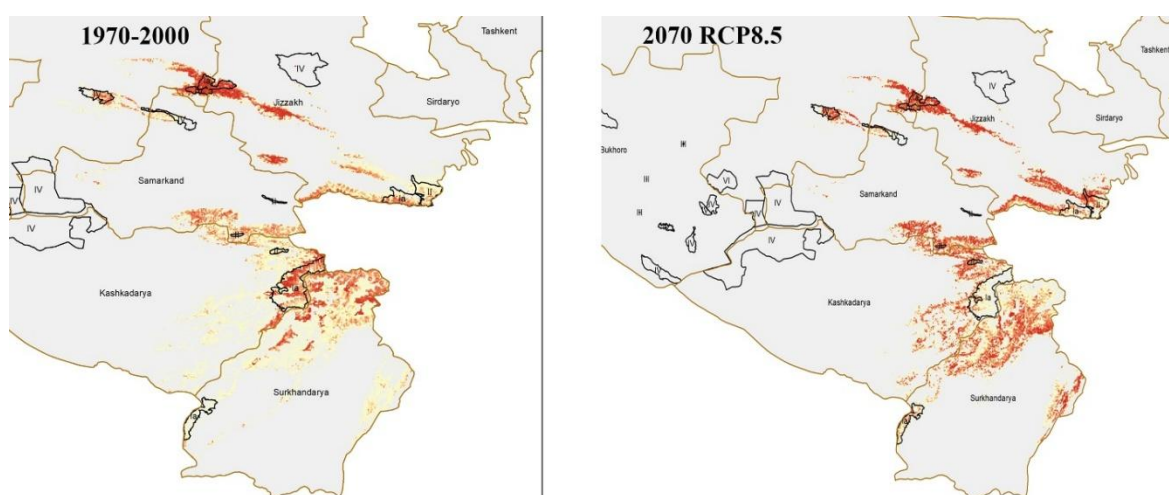
The modeling results show significant changes in the distribution of potential habitats for *Helichrysum nuratavicum*. These changes are observed between the historical period (1970–2000) and the future scenario (2070, RCP8.5). (1970–2000) The model results show that suitable habitats for *H. nuratavicum* are mainly located in the Jizzakh, Samarkand, Kashkadarya and Surkhandarya regions. The highest probability of occurrence of this species is observed in the mountainous and foothill areas, which is associated with favorable ecological conditions. The distribution patterns are fragmented, but there are stable populations, which are mainly determined by topographic and climatic factors.



Jurinea zakirovii

Figure 1. Historical distribution area of *Jurinea zakirovii* in 1970–2000 and predicted for 2070 under the RCP8.5 scenario

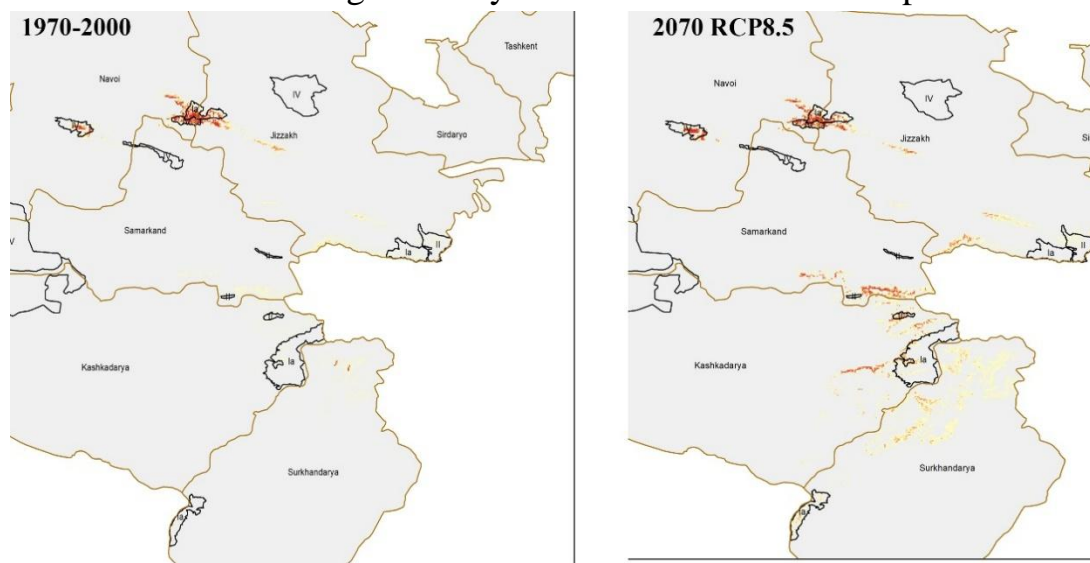
The future projection (2070, RCP8.5) based on the high emissions scenario (RCP8.5) predicts that suitable habitats will expand in some areas and shrink in others. In Surkhandarya and Kashkadarya, suitable habitats are expanding south and southeast, indicating a shift in optimal conditions. Compared to historical times, some fragmented suitable areas are merging and in some areas are showing a trend towards more continuous distribution. Maintenance of suitability in Jizzakh and Samarkand: These areas remain suitable for *H. nuratavicum*, although changes in habitat quality are observed in some areas. Possible decline in some northern areas. In some areas, habitat suitability is decreasing, which may be mainly due to increasing temperatures and changing precipitation patterns. When the main environmental factors affecting the distribution of this species were modeled for the years 1970–2000 and 2070 (RCP8.5 scenario), it was found that the factors BIO4 (temperature seasonality) and BIO7 (annual temperature range), as well as the factors Slope1 (slope $0.5\% \leq 2\%$) and Slope7 (slope $30\% \leq 45\%$) played a very significant role. These factors are important in shaping the distribution of the species, and they made a high contribution. According to the model results, these factors remained unchanged in 2070, shaping the living conditions of the species.



Helichrysum nuratavicum

Figure 2. Historical distribution area of *Helichrysum nuratavicum* in 1970–2000 and predicted for 2070 under the RCP8.5 scenario

Distribution of *Oxytropis pseudorosea* in 1970–2000 and projected range in 2070 under the RCP8.5 scenario. Distribution in 1970–2000 The main populations are located in Jizzakh, Navoi, Kashkadarya and Surkhandarya regions. Jizzakh and Navoi regions were the most common areas of this species. Smaller populations are also found in Samarkand and Kashkadarya regions. Projection under the RCP8.5 scenario in 2070. The species' range is expanding, especially in Kashkadarya and Surkhandarya regions. The factors that had the greatest impact on the distribution of the species during 1970–2000 include bio19 (precipitation in the coldest quarter), elevation (altitude), and slope2 (0.5% to 2% of slope). Under the 2070 RCP8.5 scenario, bio19 (precipitation in the coldest quarter), bio16 (precipitation in the wettest quarter), slope2 (0.5% to 2% of slope), slope8 (30% to 45% of slope), and altitude factors contribute significantly to the distribution of the species.



Oxytropis pseudorosea

Figure 3. Bioclimatic modeling map of the species *Oxytropis pseudorosea* for the historical period 1970–2000 and the RCP8.5 scenario for 2070.

In conclusion, it can be said that at the same time, the species *Jurinea zakirovii*, *Helichrysum nuratavicum*, and *Oxytropis pseudorosea*, whose natural populations are currently expanding in the Nurota botanical-geographical district, can be cited.



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