

# The Current State of the Herb-Shrub Association with the Participation of the Red Book Endemic Species *Juno Orchioides* in the Tashkent Region (Uzbekistan)

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**Abstract:-** The article provides a review of studies of the vegetation cover of the Western Tien Shan of the North-Eastern slope of the Kurama ridge of the Parkent district (the left bank of Parkentsai) with the participation of the rare endemic species *Juno orchioides*. The article presents the main results of work in the field of geobotany and botanical geography carried out in the Tashkent region. A list of plants of 4 communities of the herb-shrub association with the participation of the species *Juno orchioides* is given. The association contains more than 90 species of plants. Of these, trees – 10, shrubs – 9, perennials – 71, annuals – 8. Anthropogenic factors and grazing are the reason for the decrease in this species of *Juno orchioides*, and in the future, measures for reintroduction must be applied to preserve and restore this species.

**Keywords:-** Vegetation, Herb-Shrub Association, *Juno Orchioides*, Tashkent Region.

## I. INTRODUCTION

It is known that co-growing plants form a plant community, or phytocenosis. A plant community is a collection of plants growing on one part of the earth's surface, adapted to live together and affect each other and the environment.

Plant association is a common generic concept, differing not only in volume, but also in its essence. Community is a local, concrete concept, while association is an abstract concept, the result of generalization [1].

According to U. Allanazarova, A.Ya. Butkova and M.M. Nabieva [2], in Uzbekistan in 1923 variegated rocks (as part of *Juno narynensis*) of the Southern Pamir-Alai were originally studied by M.G. Popov. U. Allanazarova, A.Ya. Butkov, G.Kh. Khamidov in 1984 as part of a plane-

tree formation, the species *Juno warleyensis* is found with an abundance of Sp<sup>2</sup> [3]. R.S. Wernick, R.D. Melnikova, Sh.K. Kamalov [4] studied juniper formation (*Juniperus semiglobosa*) with the participation of *Juno tadshikorum*. As part of this formation, *Juno tadshikorum* is found with an abundance of Sp<sup>2</sup>. In the *Juniperus turkestanica* formation, the species *Juno parvula* is found with an abundance of sol.

Plant communities with the participation of the Red Book endemic species *Juno orchioides*, which grows in Uzbekistan, have not been previously studied. This determines the relevance and novelty of our research.

The purpose of the study is to study the current state of the herb-shrub association with the participation of the Red Book endemic species *Juno orchioides* in the Tashkent region.

## II. MATERIALS AND METHODS

We conducted a study on the distribution of the Red Book endemic species *Juno orchioides* Tratt. on the herb-shrub community in the Tashkent region (Western Tien Shan, on the northeastern slope of the Kurama ridge of the Parkent district, on the left bank of Parkentsai) 2018-2019.

***Juno orchioides*** – the investigated samples were taken: 41°18'48.857" N lat. 69°50'38.393" in. d. 14. IV. 2014 (Fig. 1). It is listed in the Red Book of the Republic of Uzbekistan [5], it is a rare endemic of the Western Tien Shan with status 3. Perennial tuberous plant. The roots are cord-shaped, slightly thickened. Bulb 2 cm thick. Stalk 10-30 cm tall, with leaves spaced; internodes are noticeable, at least at the end of flowering. The leaves are light green, sickle-shaped, bordered along the edge, rough, gradually narrowed to the apex; lower 2-5 cm wide.

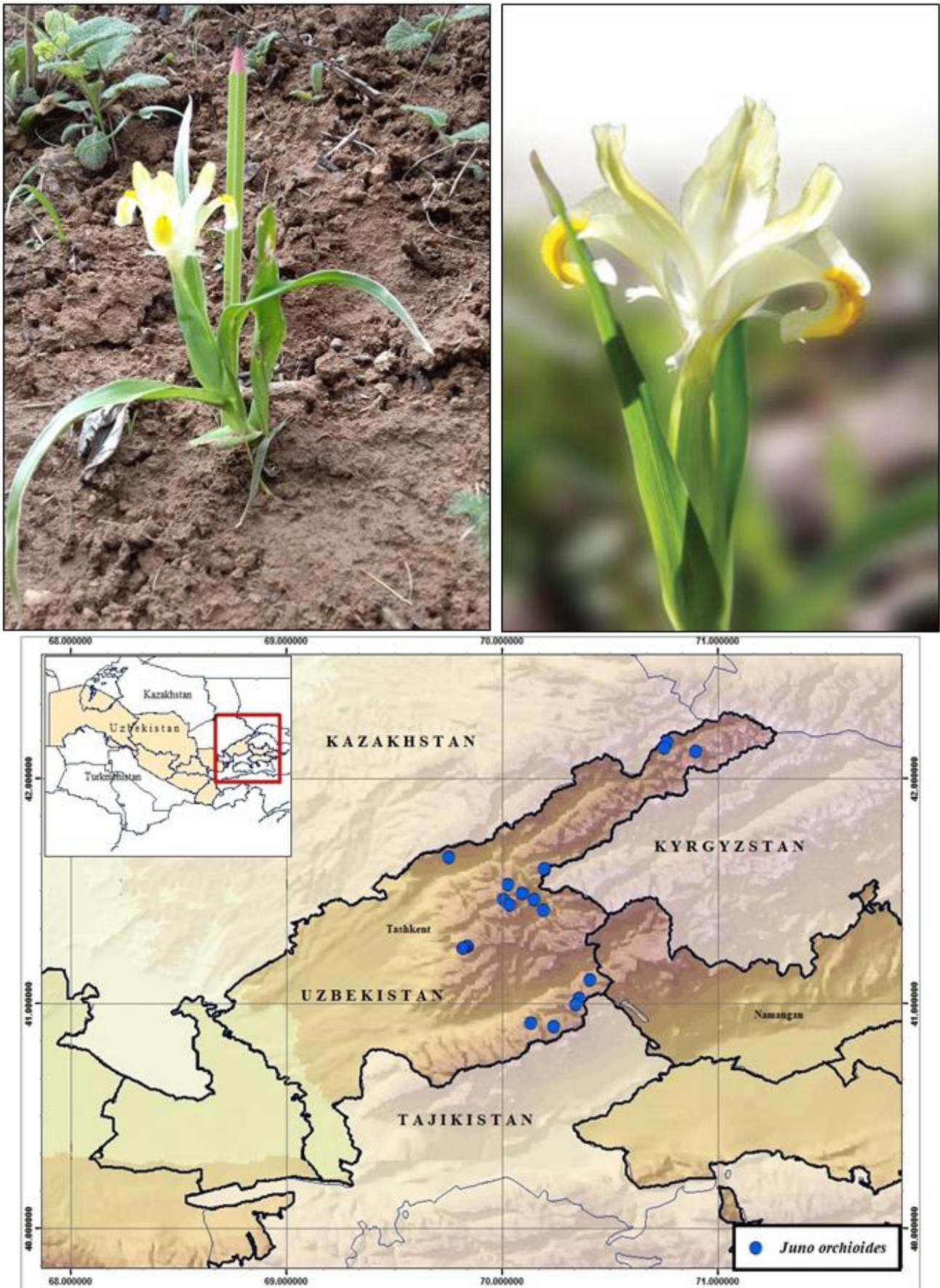


Fig 1:- General view and distribution map of *Juno orchioides* in Tashkent region

Ecology: clay and rocky slopes in the foothills and middle and lower zones of the mountains. Range: Central Asia (Western Tien Shan). Uzbekistan When describing herb-shrub communities in the Tashkent region, they used the “Methodological guidelines for the geobotanical examination of the natural forage lands of Uzbekistan” [6].

### III. RESULTS AND DISCUSSION

In 2018-2019 a study was conducted on the occurrence of the Red Book endemic species *Juno orchioides* Tratt. on the forbs and shrubs community in the Tashkent region. Four communities 30x30 m in size were studied. The height of the studied territory reaches from 1256 to 1329 m above sea level. These communities differ in soil composition: the soil of the first community is stony-gravel, gray earth; the soil of the second is black earth, less often stony; the soil of the third is black earth, less often stony; the fourth – black earth, less often stony.

As a result of the studies, the variability of the composition of plant species of the 4 studied communities

was noted. The total degree of vegetation coverage of the soil is 70-80%, the aspect is green. Of these, trees and shrubs account for 40-50%, the rest are annual and perennial plants, and ephemera accounted for 30% (table 1).

The main plant species as edificators are: *Crataegus turkestanica*, *Malus sieversii*, *Prunus divaricata*, *Crataegus pontica*, *Acer semenovii*; and as a co-identifier are: *Lonicera altmannii*, *Lonicera nummulariifolia*, *Rosa kokanica*, *Rosa fedtschenkoana*, *Ceracus erythrocarpa*, *Spiraea hypericifolia*, *Cotoneaster multiflora*; the dominant communities are *Glycyrrhiza glabra*, *Hypericum scabrum*, *Poa bulbosa*, *Ziziphora pedicellata*, *Cousinia radians*, *Bromus danthoniae*.

*Acroptilon repens*, *Achillea biebersteini*, *Eremurus regelii*, *Haplophyllum perforatum*, *Plantago lanceolata*, *Prangos pabularia*, *Phlomidoides speciosa*, *Verbascum songaricum*, *Ceratocephalus testiculatus* met as adventitious species.

Species	1	2	3	4
<b>Trees</b>				
<i>Acer turkestanicum</i> Pax.	Sp <sup>1</sup>	-	-	-
<i>Acer semenovii</i> Regel et Herd.	Sol	Sp <sup>2</sup>	-	-
<i>Crataegus turkestanica</i> A. Pojark.	Sp <sup>3</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>	-
<i>Crataegus pontica</i> C. Koch.	Sol	sp <sup>2</sup>	Sol	-
<i>Elaeagnusorientalis</i> L.		-	-	Sp <sup>1</sup>
<i>Juniperus turkestanica</i> Kom.	Sol	-	-	-
<i>Malus sieversii</i> (Ledeb.) M. Roem.	Sp <sup>1</sup>	Sol	Sol	-
<i>Padus mahaleb</i> (L.)Vass.	-	Sp <sup>1</sup>	-	-
<i>Prunus divaricate</i> Ledeb.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sol	-
<i>Pistacia vera</i> L.	-	-	-	Sol
<b>Shrubs</b>				
<i>Berberis oblonga</i> Schneid.	Sol	Sp <sup>1</sup>	Sp <sup>1</sup>	-
<i>Ceracus erythrocarpa</i> Nevski	Sp <sup>3</sup>	Sp <sup>1</sup>	-	Sp <sup>1</sup>
<i>Cotoneaster multiflora</i> Bunge.	Sol	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Ephedra equisetina</i> Bunge	-	-	-	Sol
<i>Lonicera altmannii</i> Regel et Schmalh.	sp <sup>1</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>	Sp <sup>1</sup>
<i>Lonicera nummulariifolia</i> Jaub. et Spach	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>2</sup>	Sp <sup>1</sup>
<i>Rosa kokanica</i> (Regel) Juz.	Sp <sup>2</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>	Sp <sup>1</sup>
<i>Rosa fedtschenkoana</i> Regel	Sp <sup>2</sup>	Sp <sup>1</sup>	Sp <sup>2</sup>	Sp <sup>1</sup>
<i>Spiraea hypericifolia</i> L.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<b>Perennial herbaceous plants</b>				
<i>Aegilops triuncialis</i> L.	-	-	-	Sp <sup>2</sup>
<i>Allium borsczewskii</i> Lipsky	Sol	Sol	Sol	Sp <sup>1</sup>
<i>Arctium lappa</i> L.	Sp <sup>1</sup>	-	-	-
<i>Arctium leiospermum</i> Juz. et Serg.	-	Sp <sup>1</sup>	-	-
<i>Artemisia absinthium</i> L.	Sol	-	Sol	Sp <sup>2</sup>
<i>Artemisia dracunculus</i> L.	-	Sp <sup>1</sup>	-	-
<i>Arum korolkovii</i> Regel	Sp <sup>1</sup>	-	Sp <sup>1</sup>	Sp <sup>2</sup>
<i>Astragalus ophiocarpys</i> Bent.	Sol	Sol	Sp <sup>1</sup>	-

<i>Astragalus eximius</i> Bunge	-	-	Sol	Sp <sup>1</sup>
<i>Astragalus alopecias</i> Pall.	-	-	Sol	-
<i>Aster canescens</i> (Ness.) Fisjun	-	-	-	Sp <sup>1</sup>
<i>Acroptilon repens</i> (L.) D C.	Sp <sup>2</sup>	sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Acanthophyllum albidum</i> Schischk.	-	Sp <sup>1</sup>	-	-
<i>Achillea biebersteinii</i> Afan.	Sp <sup>1</sup>	sp <sup>2</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Achillea millefolium</i> L.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>2</sup>	-
<i>Achillea filipendulina</i> Lam.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>
<i>Bromus danthoniae</i> Trin.	Sp <sup>1</sup>	Sp <sup>2</sup>	-	Sp <sup>1</sup>
<i>Bromus turkestanicus</i> Drobow	Sp <sup>1</sup>	-	-	-
<i>Bromus inermis</i> Leyss.	-	Sp <sup>1</sup>	-	Sp <sup>1</sup>
<i>Clematis orientalis</i> L.	Sol	-	-	-
<i>Cousinia vicarial</i> M. Kult.	Sp <sup>1</sup>	-	-	Sp <sup>1</sup>
<i>Cousinia radians</i> Bunge	-	Sol	Sp <sup>2</sup>	Sp <sup>2</sup>
<i>Cynodondactylon</i> (L.) Pers.	-	Sp <sup>1</sup>	-	-
<i>Carex pachystylis</i> J. Gay.	Sp <sup>2</sup>	-	Sp <sup>1</sup>	-
<i>Dictamnus angustifolius</i> G. Donfel. ex Sweet	-	-	-	Sp <sup>2</sup>
<i>Eminium lehmannii</i> (Bunge) O. Kuntze	Sp <sup>1</sup>	-	-	Sp <sup>1</sup>
<i>Euphorbia</i> sp.	-	-	-	Sp <sup>1</sup>
<i>Eremurus regelii</i> Vved.	-	Sp <sup>1</sup>	Sp <sup>2</sup>	-
<i>Elytrigia trichophora</i> (Link) Nevski	-	-	-	Sp <sup>2</sup>
<i>Echinops karatavicus</i> Regel & Schmalh.	-	-	-	Sp <sup>2</sup>
<i>Ferula tenuisecta</i> Korovin	Sol	Sol	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Galatella coriacea</i> Novopokr.	-	-	-	Sp <sup>1</sup>
<i>Galium pamiroalaicum</i> Pobed.	-	-	Sol	Sp <sup>1</sup>
<i>Glycyrrhiza glabra</i> L.	Sol	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>2</sup>
<i>Gentiana olivieri</i> Griseb.	-	-	-	Sp <sup>2</sup>
<i>Haplophyllum perforatum</i> Kar. et Kir.	-	Sp <sup>1</sup>	-	Sp <sup>1</sup>
<i>Helichrysum maracandicum</i> Popov ex Kirp.	-	-	-	Sp <sup>1</sup>
<i>Hypericum scabrum</i> L.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Hypericum perforatum</i> L.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Hordeum bulbosum</i> L.	Sp <sup>1</sup>	Sp <sup>2</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Holosteum polygamum</i> C. Koch.	-	Sp <sup>1</sup>	Sp <sup>1</sup>	-
<i>Inula helenium</i> L.	-	Sp <sup>1</sup>	-	Sp <sup>2</sup>
<i>Juno orchoides</i> Tratt.	Sol	-	-	Sp <sup>1</sup>
<i>Lamium album</i> L.	-	-	-	Sp <sup>1</sup>
<i>Ligularia thomsonii</i> (Clarke) Pojark.	-	-	Sp <sup>1</sup>	Sp <sup>2</sup>
<i>Mentha asiatica</i> Boriss.	-	-	Sp <sup>2</sup>	-
<i>Meniocus linifolius</i> (Steph.) DC.	Sp <sup>1</sup>	-	Sol	-
<i>Medicago sativa</i> L.	Sp <sup>1</sup>	-	Sp <sup>1</sup>	-
<i>Onosma dichroanthum</i> Boiss.	-	Sol	-	Sp <sup>2</sup>
<i>Origanum tythanthum</i> Gontsch.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Orobanche uralensis</i> G.Beck	Sol	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Plantago lanceolata</i> L.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Polygonum polycnemoides</i> Jaub. et Spach.	Sp <sup>2</sup>	-	Sol	-
<i>Poa bulbosa</i> L.	Sp <sup>1</sup>	Sp <sup>2</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Phleum paniculatum</i> Huds.	Sp <sup>1</sup>	-	-	-
<i>Phlomis speciosa</i> (Rupr.) Adylov, Kamelin et Makhm.	Sp <sup>1</sup>	Sol	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Prangos pabularia</i> Lindl.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>
<i>Ranunculus leptorrhynchus</i> Aitch. et Hemsl.	-	Sp <sup>1</sup>	Sp <sup>1</sup>	-
<i>Rochelia disperma</i> C. Koch.	Sp <sup>2</sup>	-	-	-
<i>Ranunculus linera</i> L.	-	-	Sp <sup>1</sup>	-

<i>Salvia sclarea</i> L.	Sol	Sol	Sp <sup>1</sup>	Sp <sup>2</sup>
<i>Taraxacum officinale</i> Web.	-	Sol	Sol	-
<i>Trifolium repens</i> L.	Sp <sup>1</sup>	-	-	Sp <sup>1</sup>
<i>Trifolium pratense</i> L.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>2</sup>	-
<i>Tragopogon turkestanicus</i> S. Nik.	-	-	-	Sol
<i>Tragopogon capitatus</i> S. Nik.	-	-	-	Sp <sup>1</sup>
<i>Tussilago farfara</i> L.	-	-	-	Sp <sup>2</sup>
<i>Verbascum songaricum</i> Schrenk	Sp <sup>2</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>
<i>Vicia gracilior</i> M. Pop.	-	Sol	-	-
<i>Vicia tenuifolia</i> Roth.	Sp <sup>1</sup>	-	-	Sol
<i>Ziziphora pedicellata</i> Pazij.etVved.	sp <sup>2</sup>	Sp <sup>2</sup>	Sp <sup>2</sup>	Sp <sup>1</sup>
<b>Annual herbaceous plants</b>				
<i>Capsella bursa-pastoris</i> (L.) Medik.	Sol	-	-	-
<i>Ceratocephalus testiculatatus</i> Crantz Besser.	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>	Sp <sup>1</sup>
<i>Erodium cicutarium</i> (L.) L'Her.	-	-	-	Sp <sup>2</sup>
<i>Koelpinia linearis</i> Pall.	Sp <sup>1</sup>	-	-	-
<i>Scabiosa micrantha</i> Desf.	-	-	-	Sp <sup>2</sup>
<i>Tortula desertorum</i> Broth.	-	Sp <sup>1</sup>	-	-
<i>Tithymalus falcatus</i> L.	Sp <sup>1</sup>	-	-	-
<i>Trigonella grandiflora</i> Bunge	-	-	Sol	-

Table 1:- List of plants of communities of the herb-shrub association with the participation of the species *Juno orchioides*

The bedding of the grass stand is well defined, 4 tiers stand out. The first tier – 3-6 m high, consists of *Crataegus turkestanica*, *Malus sieversii*, *Acer semenovii*; the second tier – 1.5-2 m high, are *Rosa kokanica*, *Rosa fedtschenkoana*, *Ceracus erythrocarpa*, *Spiraea hypericifolia*, *Cotoneaster multiflora*; the third tier – 60-100 cm high – perennial plants are found, such as: *Acroptilon repens*, *Achillea biebersteini*, *Hypericum scabrum*, *Hypericum perforatum*, *Hordeum bulbosum*, *Origanum tythanthum*, *Poa bulbosa*, *Ziziphora pedicellata*, *Cousinia radians*, *Bromus danthoniae*, *Glycyrrhiza glabra*, *Poa bulbosa*. The remaining species belong to the fourth tier.

In the study area, there was a unique population of the rare red endemic plant *Juno orchioides*, the height of which reaches 30-35 cm. This species was noted in the state of fruiting in the amount of 5-6 pieces. 2 years ago, 18-20 copies of *Juno orchioides* were recorded in the same territory. The reason for the decrease in this population, obviously, is the location near the populations of the tourist zone, which is the main reason for the disappearance of this species.

Below is a list of plants of 4 communities of the herb-shrub association with the participation of the species *Juno orchioides* (table 1). As can be seen from the table, more than 90 plant species are found in the association. Of these, trees – 10, shrubs – 9, perennials – 71, annuals – 8. It is known that the abundance of perennials in the plant

community (78%) is a characteristic feature for all mountainous areas of Central Asia.

#### IV. CONCLUSION

Thus, for the first time, a study was conducted on the distribution of the endemic species Red Book *Juno orchioides* on the herbaceous-shrub community of the Western Tien Shan of the Northeast slope of the Kurama Range. The occurrence of some species in only one area was noted (*Juniperus turkestanica*, *Elaeagnus orientalis*, *Pistacia vera*, *Ephedra equisetina*, *Vicia gracilior*, *Rochelia disperma*, *Ranunculus linera*, *Elytrigia trichophora*, *Phleum paniculatum*, *Phlomidoides speciosa*, etc.). It should also be noted a decrease in vegetation cover on the upper zones of the mountain. The reason for the decrease in the number of *Juno orchioides* species in the study area is apparently due to the influence of anthropogenic factors and cattle grazing, and in the future, reintroduction measures must be applied to preserve and restore this species. The diversity of adventitious species in these associations indicates the presence of various forms of anthropogenic pressure in the territory.

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