



Taxonomic inventory and distributions of Chenopodiaceae (Amaranthaceae s.l.) in Orenburg Region, Russia

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Abstract

Background

Orenburg Region is located in the South Urals, mostly in the steppe zone and is characterised by various landscapes suitable for many Chenopodiaceae. The species of Chenopodiaceae are present in all major plant communities (saline vegetation, steppes, on limestone, chalk and sand, and as degraded or ruderal communities). In the steppe zone, many native subshrubby species (*Atriplex cana*, *Caroxylon laricinum*, *Suaeda physophora*) playing a crucial role in semi-deserts (known as southern steppes in the recent Russian literature) located southwards of Orenburg Region are locally found, and several annuals (*Salicornia perennans*, *Suaeda* spp.) are most common dominants in plant communities. Some typical semi-desert species (*Kalidium foliatum*, *Bassia hyssopifolia*, *Soda foliosa*, *Spirobassia hirsuta*) are found in the easternmost part of the region.

New information

We compiled a checklist of Chenopodiaceae in Orenburg Region, with two new records (*Chenopodium virgatum*, *Corispermum laxiflorum*), based on our critical revision, comprehensive inventory of herbarium specimens and documented observations and field research. In total, we report 76 species in the Region, which is the third-highest number of the Chenopodiaceae species compared with other administrative territories of European Russia, North Caucasus and West Siberia. Alien and native taxa are distinguished. Zonal patterns of species distributions are confirmed. A preliminary conservation status is proposed for each native species. Three species are recommended for exclusion from the Red Data Book of Orenburg Region: *Petrosimonia triandra* (because of its extensive distribution), *Kalidium foliatum* and *Anabasis salsa* (because of the lack of actual threat to their populations). *Arthrophytum lehmannianum* and *Salsola rosacea* are considered threatened (Vulnerable) because of their restricted occurrence and population size and because their localities are under anthropogenic pressure. *Atriplex hortensis*, *Atriplex rosea*, *Chenopodium acuminatum*, *C. karoii*, *C. praetericola*, *C. vulvaria*, *Climacoptera affinis*, *C. crassa*, *Halimocnemis karelinii*, *Salsola paulsenii* and *Xylosalsola arbuscula* are excluded from the checklist, based on various reasons as discussed in the paper. Point distribution maps are provided for each species. *Agriophyllum pungens* (Vahl) Link is accepted as the correct authorship instead of "M.Bieb. ex C.A.Mey."

Keywords

alien plants, arid lands, checklist, conservation, forest steppes, mapping, steppes

Introduction

Orenburg Region is a first-level administrative territory (federal subject) of the Russian Federation (Fig. 1). It covers the southern extensions of the Ural Mountains (Guberlyya Mts.) and adjacent portions of the East European Plain in the west and the West Siberian Plain in the east, which are mostly hilly; it also includes tiny portions of the Caspian Lowlands in the south-west. Orenburg Region is divided by the border between Europe and Asia, tentatively running along the watershed of the Urals (Shahgedanova et al. 2002). At the Russian scale, it is a relatively small administrative territory that extends to slightly less than 124,000 km², thus ranking 39 in the list of federal subjects of Russia by area.

The family Chenopodiaceae Vent (Amaranthaceae Juss. s.l.) is most abundant in arid zones of Eurasia (Wulf 1943, Zhu 1995, Akhiani et al. 1997). The majority of Chenopodiaceae in the Eurasian steppe zone, including Orenburg Region, are confined to open plant communities, especially on saline substrates (Prokopyeva et al. 2021). This type of vegetation is characterised by a wide variability in response of plants to the local conditions (e.g. Kamenetskaya (1952), Gordeeva and Larin (1965), Saiz et al. (2018)). Open vegetation types, most commonly steppes, are threatened due to extensive

agricultural use of the steppe zone in the recent times (Török et al. 2016, Tsiripidis 2016, Liu and Wang 2021). In Orenburg Region, five species of Chenopodiaceae (*Anabasis cretacea* Pall., *A. salsa* (Ledeb.) Benth. ex Volkens, *Kalidium foliatum* (Pall.) Moq., *Nanophyton erinaceum* (Pall.) Bunge, *Petrosimonia triandra* (Pall.) Simonk.) were included in the Red Data Book of Orenburg Region (Belov 2019).

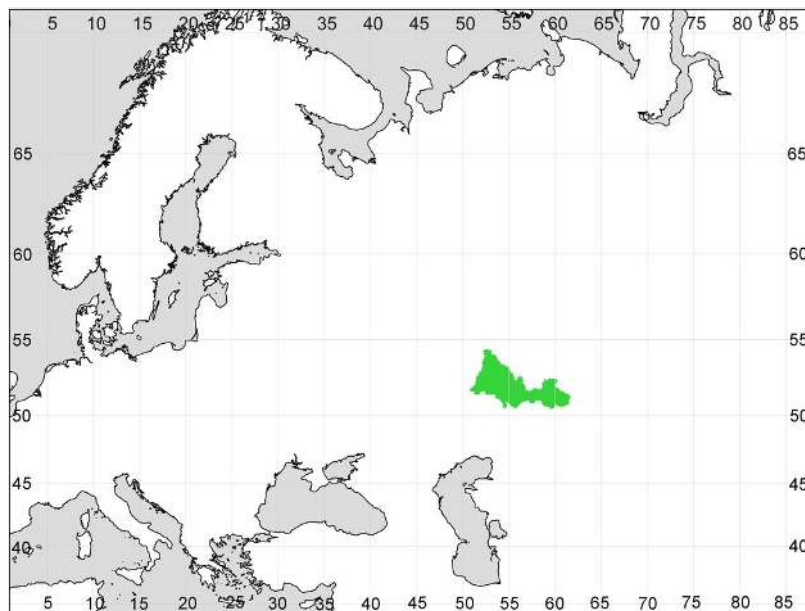


Figure 1. [doi](#)

Location of Orenburg Region in Eurasia.

The Chenopodiaceae of Orenburg Region were not specifically studied between the late 18th century and the early 20th century. Although the territory of present-day Orenburg Region was effectively included in the Russian Empire by building a chain of fortifications along the Southern Urals in 1730s-1740s, it was rarely visited by botanists due to its remote position at the very limit of the Empire and the ongoing battles with the nomadic population. Fenzl (1851) provided the first records of seven most common species of Chenopodiaceae in the territory, based on the collections of P.S. Pallas from the 18th century. Among the early plant hunters, G.S. Karelin and Antonov (first name unknown) collected some specimens from "Orenburg", but their annotations are considered unreliable (e.g. Knjazev (2009)) because their specimens were most likely at least partly collected in present-day Kazakhstan. The first reliable scientific collections of Chenopodiaceae of Orenburg Region were assembled by Yu. Schell, D.I. Litvinov and other people who made botanical excursions to the Southern Urals and neighbouring steppes in the late 19th and early 20th centuries, but a large-scale botanical exploration of the territory started following the ground-breaking description and analysis of the vegetation of south-eastern European Russia and north-western Kazakhstan published by Krascheninnikov (1925).

Ilijin (1930) critically summarised the knowledge on the diversity of Chenopodiaceae in south-eastern European Russia, including parts of Orenburg Region, based on the herbarium collections which are partly at LE, but partly no longer available. He developed an original taxonomy of the family and provided an analysis of its diversity and distributions according to the vegetation zones delimited by Krascheninnikov (1925). This treatment was a milestone in taxonomic studies of Chenopodiaceae in the arid zone of Eurasia.

Further accumulation of herbarium collections from Orenburg Region was largely connected with its geobotanical exploration, especially for the Soviet development of steppe territories into arable lands (Ryabinina 1998).

The multivolume Flora of Eastern Europe belongs to the most significant floristic overviews of the late 20th century (Sennikov and Geltman 2005). It provided taxonomic and distributional data for the territories situated west from the Ural watershed, i.e. including the western part of Orenburg Region. This work (Gusev 1996, Medvedeva 1996, Mosyakin 1996, Tzvelev 1996) gives a broad-scale overview of the taxonomy and distributions of Chenopodiaceae of Eastern Europe. Due to the brief format of this work, it is impossible to separate the data on Orenburg Region or even ascertain the presence of some species in the region because individual administrative territories were not specified. In particular, many species (e.g. *Chenopodium vulvaria*) were treated in this work as occurring in the whole territory of the Transvolga Floristic Region, including Orenburg Region, which have never been reported in more detailed surveys and supported by herbarium specimens or other documented observations. *Atriplex rosea* was also included in this work, but treated as absent in Orenburg Region by Sukhorukov et al. (2022).

The modern period in floristic works was started with Z.N. Ryabinina, who studied the flora and vegetation of Orenburg Region towards a floristic synopsis with detailed distributions (Ryabinina 1998), inventories of protected (Ryabinina 1995), arboreal (Ryabinina and Vyelmovsky 1999), riparian and aquatic plants (Ryabinina and Rachenkova 2008) and the steppe vegetation (Ryabinina 2003). Her floristic works were based on extensive field observations, but practically no voucher specimens were preserved, thus not allowing the verification of the distributional data. During the same period, extensive herbarium collections were made by field botanists from Ekaterinburg, M.S. Kniazev and P.V. Kulikov. As a result of this collection activity, a new treatment of Chenopodiaceae was published (Knjaev 2009), with supplements based on the later fieldwork (Golovanov et al. 2018).

In 2020-2021, the first author in cooperation with other botanists carried out fieldwork in Orenburg Region, specifically targeting the family Chenopodiaceae. During our field and herbarium studies, we noted that the taxonomic composition of the family, species distributions, their roles in plant communities and possible conservation need to be further studied in details or significantly improved. Some important data (recorded by Ryabinina) cannot be authenticated properly, whereas many older herbarium collections originated from Orenburg Region in the 1930s and scattered in local herbaria (e.g. MOSP, PKM) have never been revised and included in floristic and conservational work. Other important treatments either utilised the information accumulated in the largest Russian herbaria (LE and MW) or were based on the locally collected and preserved information. To date, no

attempt has been made to summarise and verify the information accumulated in all the collections, in order to produce a reliable treatment of Chenopodiaceae in Orenburg Region and its analysis in the context of the zonal patterns of Eurasian steppes.

The aims of the present study are: (1) to include new records and more information about species distributions of Chenopodiaceae in Orenburg Region, based on a new critical revision of the herbarium material in all available collections and our own field work, as well as comparisons of the species diversity between Orenburg Region and other territories in the steppic zone of Eastern Europe, North Caucasus and West Siberia; (2) to revise distributions and produce point maps for all species, showing their distribution patterns; and (3) to re-evaluate their conservation status in provisional IUCN assessments.

Materials and methods

Study area

This study is strictly limited by the administrative borders of Orenburg Region, Russian Federation. Bounding coordinates: south-west 50.506° N, 50.768° E; north-east 54.374° N, 61.066° E.

Orenburg Region lies in the forest-steppe and steppe zones (Fig. 2) but includes a variety of intrazonal landscapes, i.e. limestones, sands and saline lands (Ryabinina 1998). In the north-western part, the steppe vegetation is interspersed by various forest types including broad-leaved and pine forests. The steppe zone is subdivided into two belts, which remarkably differ in their water regime and vegetation: the northern steppe, a more humid area of *Stipa*, *Festuca* and forb steppes and the true steppe, a drier area of *Stipa* and *Festuca* steppes with a considerable participation of semi-desert plants and a lesser influence of forbs (Chibilyov 2002). The flora and vegetation are remarkably different in the European and Siberian parts of the Region, depending on the influence of the European and Central Asian floras (Krascheninnikov 1925). This difference is based on a higher continentality of the Asian steppes (Chibilyov 2002). According to recent studies (Safronova 2021), *Artemisieta santonicae* and *Artemisieta lerchianae* predominate in the Transvolga Region, whereas *Artemisieta nitrosae* prevails in the Transural Region. This difference may also be caused by a greater aridity and continentality of the Transuralian territories, because the Ural Mountains effectively act as a barrier for the oceanic climate (Shahgedanova et al. 2002).

The exact delimitation of the steppe zone in Orenburg Region has been debated and variously represented on vegetation maps, of which the most recent was published by Ogureeva (1999). We accept the subdivisions and limits of the steppe zone made in that work and corrected on the basis of recent field studies (Safronova et al. 2020, Safronova 2021).

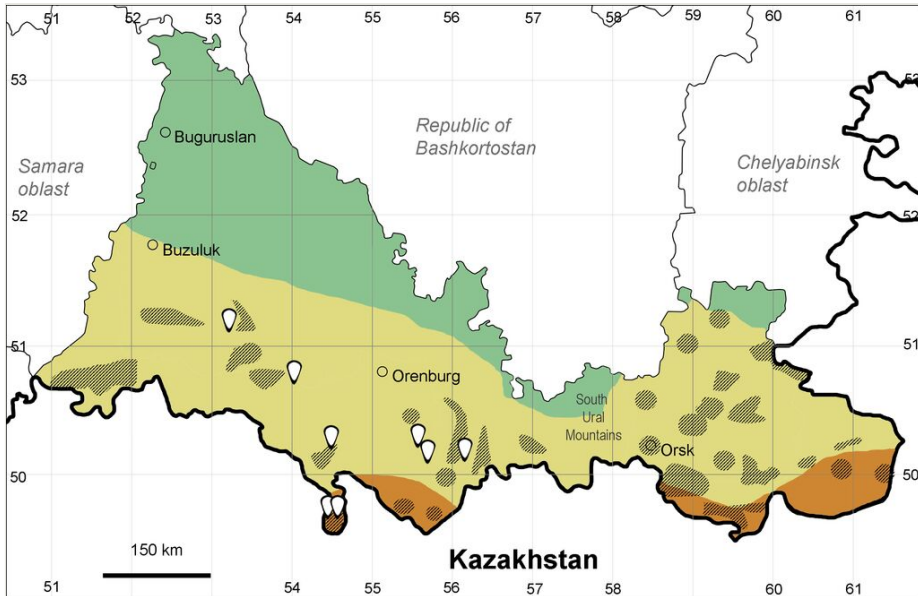


Figure 2. [doi](#)

Zonal subdivision and azonal substrates of Orenburg Region. Green: forest steppe; straw: northern steppe; brown: true steppe. Hatching: saline lands; white symbols: calcareous outcrops. Sources: Ogureeva (1999), corrected after Safronova et al. (2020) and Safronova (2021).

Taxonomic scope

In this work, we include native and alien (spontaneous) taxa of Chenopodiaceae occurring in the study area. Alien taxa are considered spontaneous if they occur without direct human assistance. Unlike in previous treatments (Iljin 1936, Ryabinina 1998, Knjazev 2009), cultivated taxa (e.g. *Beta vulgaris* L.) are excluded if they do not occur spontaneously outside the places of their introduction or if they do not persist in places of introduction when the cultivation activities have ceased for a considerably long time. Alien taxa are subdivided into casual and established (naturalised) aliens, based on their long-term persistence (Pyšek et al. 2004).

Taxonomy

Our checklist is organised taxonomically according to the following system (genera classified in subfamilies and tribes).

Chenopodioideae Burnett: Anserineae Dumort. (*Blitum* L.), Dysphanieae Pax (*Teloxys* Moq., *Dysphania* R.Br.), Chenopodieae Dumort. (*Atriplex* L., *Chenopodium* L., *Chenopodiastrum* S.Fuentes, Uotila & Borsch, *Halimione* Aellen, *Lipandra* Moq., *Oxybasis*

Kar. & Kir.), Axyrideae G.Kadereit & Sukhor. (*Axyris* L., *Ceratocarpus* L., *Krascheninnikovia* Gueldenst.).

Corispermioideae Raf.: *Agriophyllum* Link, *Corispermum* L.

Salicornioideae Kostel.: *Halocnemum* M.Bieb., *Kalidium* Moq., *Salicornia* L.

Suaedoideae Ulbr.: *Suaeda* L.

Camphorosmoideae A.J.Scott: *Bassia* All., *Camphorosma* L., *Sedobassia* Freitag & G.Kadereit, *Spirobassia* Freitag & G.Kadereit.

Salsoloideae Raf.: Caroxyleae Akhani & Roalson (*Caroxylon* Thunb., *Nanophyton* Less., *Ofaiston* Raf., *Petrosimonia* Bunge, *Pyankovia* Akhani & Roalson), Salsoleae C.A.Mey. (*Anabasis* L., *Arthrophytum* Schrenk, *Halogeton* Ledeb., *Salsola* L., *Soda* Fourr.).

Phylogenetically, the family Chenopodiaceae is accepted and circumscribed as a part of the Amaranthaceae s.l. alliance (e.g. Kadereit et al. (2003), Ogundipe and Chase (2009)). The infrafamilial relationships and generic delimitations were greatly improved and specified by the recent detailed studies based on molecular phylogeny: Hohmann et al. (2006) in Betoideae; Kadereit and Freitag (2011) in Camphorosmoideae, Kadereit et al. (2010), Fuentes-Bazan et al. (2012a), Fuentes-Bazan et al. (2012b), Sukhorukov et al. (2018), Uotila et al. (2021) in Chenopodioideae; Shepherd et al. (2005), Kadereit et al. (2006) in Salicornioideae; Akhani et al. (2007), Wen et al. (2010) in Salsoloideae and Schütze et al. (2003) in Suaedoideae. *Polycnemum* L., traditionally included in Chenopodiaceae s.str. (Ryabinina 1998, Knjazez 2009), is excluded from the checklist because it was placed in Amaranthaceae s.str. in molecular phylogenetic studies (Kadereit et al. 2003).

For generic delimitations and species classifications, we accepted the latest revisions of Chenopodieae (Fuentes-Bazan et al. 2012b), Dysphanieae (Uotila et al. 2021), some *Chenopodium* (Uotila and Lomonosova 2016, Lomonosova and Uotila 2022) and *Suaeda* (Lomonosova et al. 2008). The general taxonomic framework was proposed by Sukhorukov (2014).

Nomenclature

We verified and corrected the nomenclature of accepted names and their synonyms according to their protologues and the current rules of botanical nomenclature. References to the places of valid publication are provided for each name at the rank of species and below. By accepted species names, links are provided to the corresponding entries in IPNI, although the nomenclatural and bibliographic data in these entries are not necessarily full and correct. The most important synonyms are given, especially those used in the previous accounts (Ilijn 1930, Gusev 1996, Medvedeva 1996, Mosyakin 1996, Tzvelev 1996, Ryabinina 1998, Knjazez 2009). Typifications are not cited as deemed inappropriate in a regional inventory, but synonyms are organised according to their types.

Distributions

Species distributions in Orenburg Region are indicated according to the current first-level administrative subdivisions (districts, largest towns). District names in English are derived from the names of their respective administrative centres.

Species distributions in Orenburg Region are compiled and visualised on point maps strictly according to the specimens examined and documented observations. Literature data (Ryabinina 1998, Knjazev 2009) may differ in details because of undocumented observations taken into account; such differences are mentioned or discussed case by case. Species distributions outside Orenburg Region follow Sukhorukov (2014), with updates.

Doubtful and unconfirmed records from the 19th century were excluded from the checklist and added to the list of rejected records, whereas more certain records of *Kalidium caspicum* and *Corispermum laxiflorum* originating from the early 20th century were retained in the main checklist. These two species may be recollected like *Petrosimona brachyphylla*; the first record of this species originated in the 1930s and was confirmed by three recent gatherings in this study.

We compared the number of species in Orenburg Region with those in other regions of southern European Russia (Bashkortostan, Chelyabinsk Region, Rostov Region, Samara Region, Saratov Region, Volgograd Region), West Siberia (Kurgan Region) and East Caucasus (Dagestan), from which more complete data were available. These administrative units are fully or partially located in the steppe zone, thus sharing many suitable habitats. The species numbers of Chenopodiaceae in these territories were taken from earlier accounts: Murtazaliev (2009) for Dagestan, Naumenko (2008) for Kurgan Region, Sukhorukov (2014) with additions (Muldashev et al. 2017; Sukhorukov, in prep.) for European Russia.

Material

We traced and revised almost all specimens of the Chenopodiaceae ever collected from Orenburg Region. Specimens kept in the following herbaria were studied (acronyms according to Thiers (2024)): LE, LECB, MHA, MOSM, MOSP, MW (GBIF 2023b), MWG, NNSU, ORIS, PKM, PVB, SARAT, SVER (as images), TLT, UFA (as images) and Herbarium of the Orenburg Pedagogical University (not registered in Index Herbariorum). Verified data from iNaturalist (GBIF 2023a) were also included. Our own field studies (2000-2022) were undertaken in various districts of Orenburg Region and specimens were deposited to BR, K, LE, MW, MHA and ORIS. All specimens examined and documented observations were provided as an occurrence dataset in the Supplement (Suppl. material 1).

Species occurrences were georeferenced by the authors and mapped using SimpleMapp online tool (Shorthouse 2010). For the most widespread species, we have mapped all

records and additionally hatched the districts where the species are clearly present even in the absence of current records.

Conservation assessments

Regional conservation status of each native species was preliminarily assessed using the IUCN Red List Categories and Criteria (IUCN 2012) according to our knowledge about their distributions and projected reductions of population size (IUCN 2012b). Area of occupancy (AOO) and extent of occurrence (EOO) were calculated with the Geospatial Conservation Assessment Tool (GeoCAT: Bachman et al. (2011)).

Chenopodiaceae of Orenburg Region

Blitum virgatum L.

- IPNI [urn:lsid:ipni.org:names:164548-1](http://www.ipni.org/names/164548-1)

Nomenclature:

Blitum virgatum L., Sp. Pl. 1: 4 (1753) $\equiv$ *Morocarpus foliosus* Moench, Methodus: 342 (1794), nom. illeg. $\equiv$ *Chenopodium foliosum* Asch., Fl. Prov. Brandenburg 1: 572 (1864).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 41,345 km², AOO 48 km². Not rare, no reduction or decline.

Distribution: Orenburg Region (western districts): Alexandrovka, Belyaevka, Buguruslan, Buzuluk, Novosergievka, Saraktash, Sorochinsk, Tashla Districts (Fig. 3). Eastern limit of the European distribution fragment.

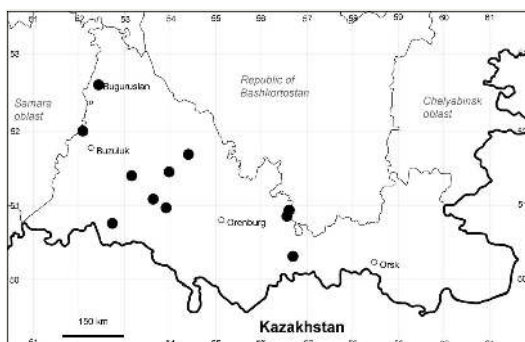


Figure 3. [doi](#)

Distribution map of *Blitum virgatum* (confirmed occurrences).

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on limestone, gravels, also in human-disturbed sites. It was found in scattered occurrences in the Region. Ryabinina (1998) and Knjazev (2009) assumed that the species distribution is broader than it is currently confirmed.

The species is distributed as native in the Mediterranean, West and Central Asia, Iran and the Himalayas. It is known as alien in North America, rest of Europe, South Africa and temperate Asia.

***Teloxys aristata* (L.) Moq.**

- IPNI [urn:lsid:ipni.org:names:1113636-2](http://www.ipni.org:5000/ipni/name/ipni.org:names:1113636-2)

Nomenclature:

Teloxys aristata (L.) Moq., Ann. Sci. Nat. Bot., ser. 2(1): 289 (1834) $\equiv$ *Chenopodium aristatum* L., Sp. Pl. 1: 221 (1753) $\equiv$ *Dysphania aristata* (L.) Mosyakin & Clemants, Ukr. Bot. Zhurn. 59(4): 383 (2002).

Native status: Alien. Presumably casual.

Conservation status: Not applicable.

Distribution: Orenburg Region (western districts): Kurmanaevka, Ponomaryovka, Severnoe Districts (Fig. 4).

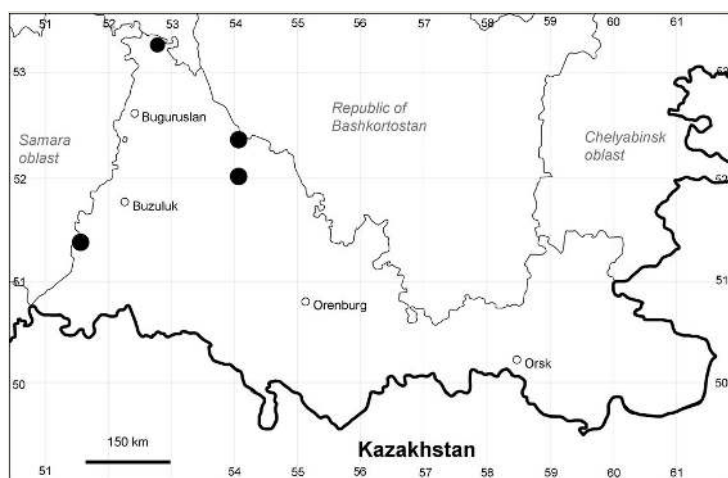


Figure 4. [doi](#)

Distribution map of *Teloxys aristata*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on sands, also in human-disturbed sites. Rare in the Region.

The species is distributed as native in Central Asia and the Himalayas. It is known as alien in North America, Europe, North and East Asia.

***Dysphania botrys* (L.) Mosyakin & Clemants**

- IPNI [urn:lsid:ipni.org:names:1076147-2](http://www.ipni.org/names/1076147-2)

Nomenclature:

Dysphania botrys (L.) Mosyakin & Clemants, Ukr. Bot. Zhurn. 59(4): 383 (2002) ≡ *Chenopodium botrys* L., Sp. Pl. 1: 219 (1753).

Native status: Native.

Conservation status: Data Deficient (DD).

A single occurrence has been confirmed, but the species distribution is presubambly broader (Ryabinina 1998, Knjazev 2009). For this reason, a threatened category has not been assigned.

Distribution: Orenburg Region: Sakmara District (Fig. 5).

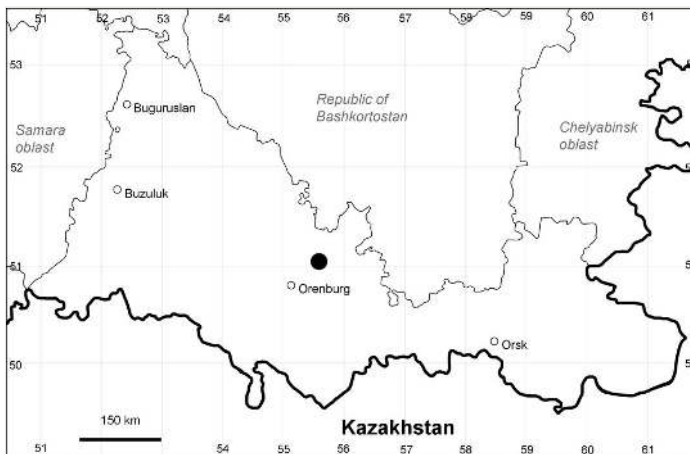


Figure 5. [doi](#)

Distribution map of *Dysphania botrys* (confirmed occurrence).

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on limestone, screes, also in human-disturbed sites. Only one collection is known, dated 1980s, although Ryabinina (1998) and Knjazev (2009) considered the species to occur in several districts.

The species is distributed as native in arid and semi-arid parts of Eurasia (predominantly the Irano-Turanian and Mediterranean Regions). It is known as alien in Northern and Central Europe, Northern Africa and North America.

Atriplex aucheri Moq.

- IPNI [urn:lsid:ipni.org:names:163662-1](https://www.ipni.org/names/163662-1)

Nomenclature:

Atriplex aucheri Moq., Chenop. Monogr. Enum.: 51 (1840).

= *Atriplex amblyostegia* Turcz., Bull. Soc. Nat. Mosc. 25(2): 416 (1852).

= *Atriplex nitens* subsp. *desertorum* Iljin, Bull. Jard. Bot. Princ. l'URSS 26: 414 (1927).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections.

Distribution: Orenburg Region: Totskoe District (Fig. 6).

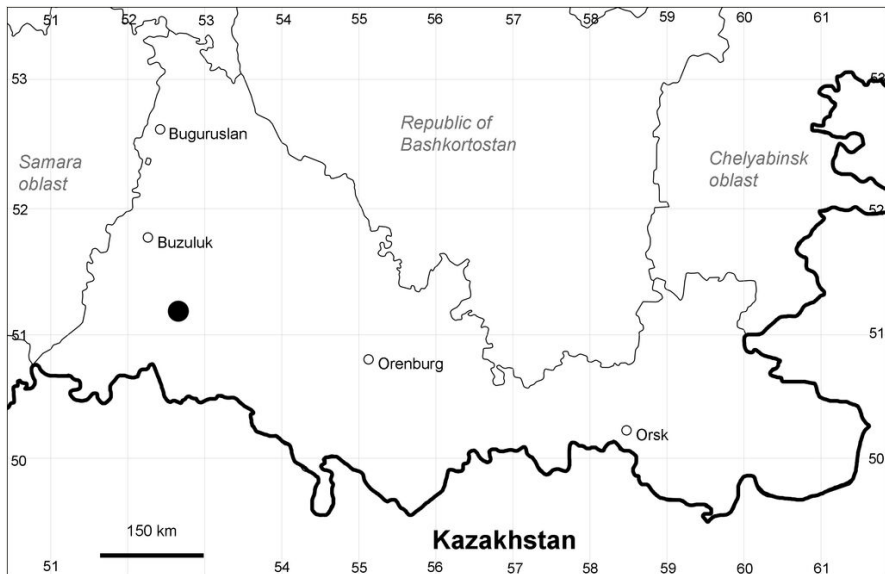


Figure 6. [doi](#)

Distribution map of *Atriplex aucheri*.

Previous reports: Knjazev (2009).

The species occurs on saline substrates, also in human-disturbed sites. Only one collection, dated 1930s.

The species is distributed in the Black Sea area (westwards to Bulgaria), European Russia (south-eastern part), the Caucasus, Central and West Asia, north-western China.

***Atriplex cana* Ledeb.**

- IPNI [urn:lsid:ipni.org:names:163698-1](https://nbn-resolving.org/urn:lsid:ipni.org:names:163698-1)

Nomenclature:

Atriplex cana Ledeb., Ic. Pl. Fl. Ross. 1: 11 (1829) $\equiv$ *Sukhorukovia cana* (Ledeb.) Vasjukov, Botanika (Minsk) 44: 119 (2015).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 71,750 km², AOO 80 km². Common, no reduction or decline.

Distribution: Orenburg Region (eastern and southern districts): Adamovka, Akbulak, Belyaevka, Dombarovka, Gai, Kvarkeno, Novoorsk, Pervomaiskii, Sol'-Ilets, Svetlyi, Yasnyi Districts, Orsk Town (Fig. 7).

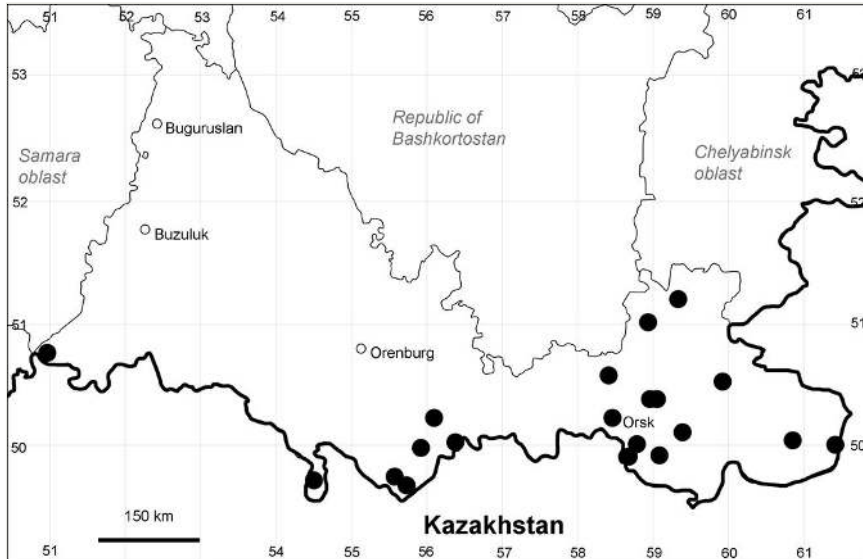


Figure 7. [doi](#)

Distribution map of *Atriplex cana*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on saline substrates, in petrophytic steppes. It is frequent in the south and east of the Region.

The species is distributed in Eastern Europe (south-eastern part), southern Siberia, the Caucasus, Central Asia (Kazakhstan, northern Uzbekistan), western Mongolia, north-western China.

***Atriplex intracontinentalis* Sukhor.**

- IPNI [urn:lsid:ipni.org:names:77080816-1](https://www.ipni.org/urn:lsid:ipni.org:names:77080816-1)

Nomenclature:

Atriplex intracontinentalis Sukhor., Ann. Naturhist. Mus. Wien 107 B: 349 (2006).

– *Atriplex littoralis* auct.: Iljin (1930).

– *Atriplex laevis* auct.: Medvedeva (1996).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 79,880 km², AOO 56 km². Common, no reduction or decline.

Distribution: Orenburg Region (whole territory): Asekeevo, Belyaevka, Buzuluk, Gai, Krasnaya Gvardia, Kuvandyk, Kvarkeno, Sakmara, Svetlyi, Tashla Districts, Orsk Town (Fig. 8).

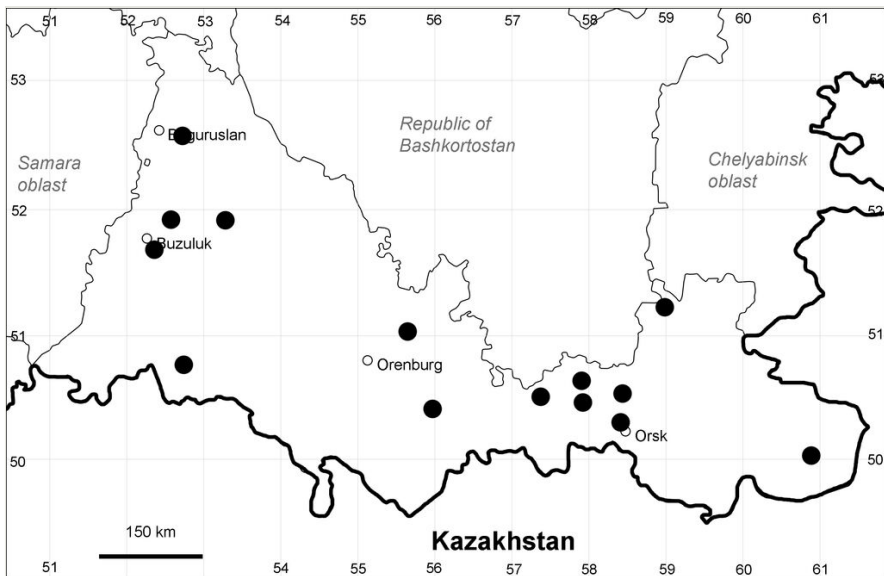


Figure 8. [doi](#)

Distribution map of *Atriplex intracontinentalis*.

Previous reports: Ryabinina (1998), as *A. littoralis*; Sukhorukov (2006), Knjazev (2009).

The species occurs on saline substrates. It is frequent in the Region.

The species is distributed in Central and Eastern Europe, southern Siberia, Kazakhstan.

Atriplex laevis Ledeb.

- IPNI [urn:lsid:ipni.org:names:60448166-2](http://www.ipni.org:80/urn:lsid:ipni.org:names:60448166-2)

Nomenclature:

Atriplex laevis Ledeb., Ic. Pl. Fl. Ross. 1: 10 (1829).

Native status: Native. Knjazev (2009) noted that this species occurs on saline substrates, but also spreads along railway embankments.

Conservation status: Least Concern (LC).

EOO 520 km², AOO 24 km². Despite the apparently restricted occurrence at the very margin of the distribution area, the species demonstrates no tendency in reduction of its distribution or in decline of its populations. Moreover, it expands to secondary habitats (Knjazev 2009).

Distribution: Orenburg Region (south-eastern districts): Svetlyi, Yasnyi Districts (Fig. 9). North-western limit of the native species distribution.

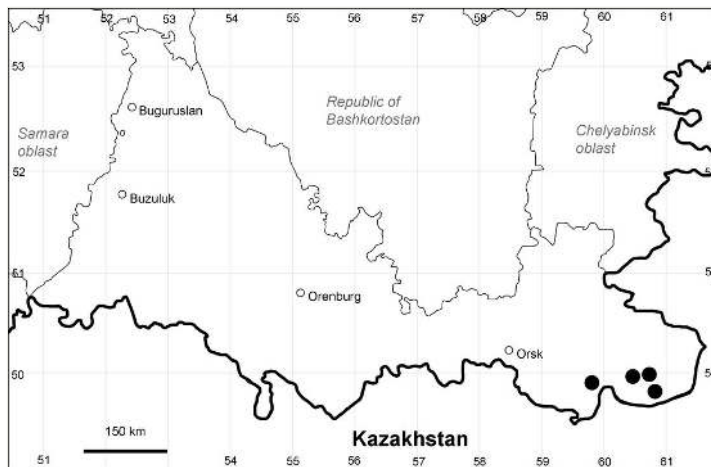


Figure 9. [doi](#)

Distribution map of *Atriplex laevis*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on saline lands and sands, along waterbodies, also in human-disturbed sites. It is rare in the Region.

The species is distributed as native in southern Siberia, Mongolia, north-western and northern China, northern and eastern Kazakhstan. It is alien in Fennoscandia, Eastern Europe, West Asia (Turkey), Iran, Syria, Caucasus (Armenia), East Asia (Korea, Japan), Central Asia (western Kazakhstan, Tajikistan).

Atriplex micrantha Ledeb.

- IPNI [urn:lsid:ipni.org:names:60448164-2](http://www.ipni.org/names/60448164-2)

Nomenclature:

Atriplex micrantha Ledeb., Icon. Pl. Fl. Ross. 1: 11 (1829).

= *Atriplex heterosperma* Bunge, Beitr. Fl. Russl.: 272 (1852).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 67,635 km², AOO 44 km². This species is not rare and has no tendency for declining.

Distribution: Orenburg Region: Belyaevka, Krasnaya Gvardia, Kuvandyk, Kvarkeno, Novoorsk, Novosergievka, Sol'-Iletsk, Svetlyi, Yasnyi Districts, Orenburg City (Fig. 10). The species is very common in Orenburg Region and its occurrence in other districts is suggested (Ryabinina 1998, Knjazez 2009).

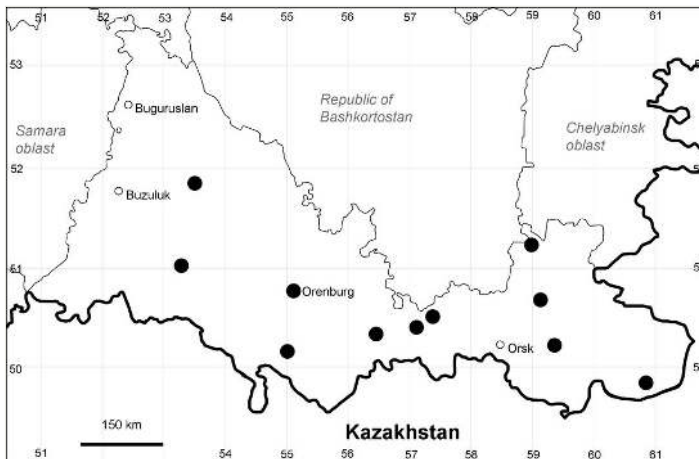


Figure 10. [doi](#)

Distribution map of *Atriplex micrantha* (confirmed occurrences).

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on saline substrates, sometimes as a weed. It was found sporadically mostly in the southern part of the Region.

The species is distributed as native in Central Asia, north-western China, southern Siberia, in steppes and deserts of southern Eastern Europe. It is known as alien in Western, Central and Northern Europe (as ephemerophyte in Fennoscandia), West Asia, East Asia (Russian Far East), temperate North and South America.

***Atriplex oblongifolia* Waldst. & Kit.**

- IPNI [urn:lsid:ipni.org:names:164012-1](https://www.ipni.org/names/164012-1)

Nomenclature:

Atriplex oblongifolia Waldst. & Kit., Descr. Icon. Pl. Rar. Hung. 3: 278 (1812).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 34,900 km², AOO 36 km². This species is not rare and has no tendency for declining.

Distribution: Orenburg Region (western districts): Asekeevo, Belyaevka, Buguruslan, Kuvandyk, Novosergievka, Oktyabskoe, Saraktash, Sol'-Iletsk Districts (Fig. 11).

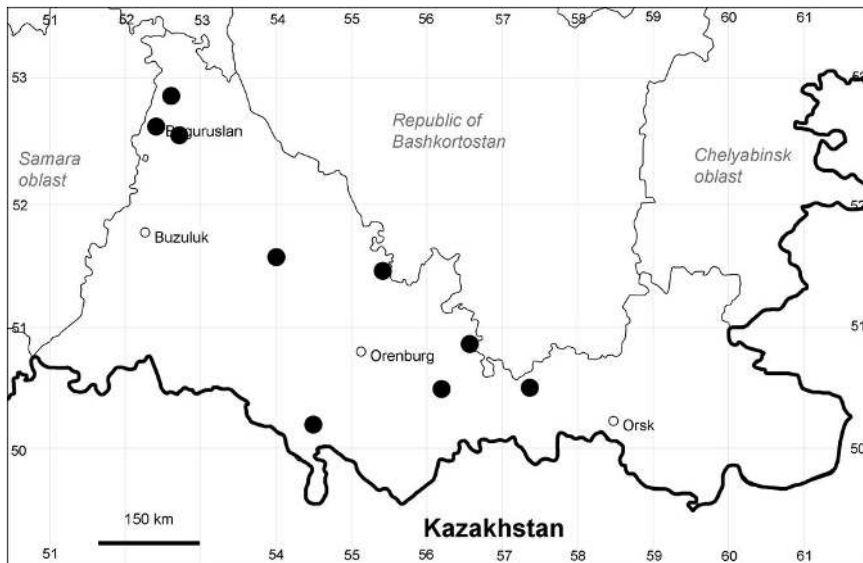


Figure 11. [doi](#)

Distribution map of *Atriplex oblongifolia*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs in steppes, meadows, on saline lands, also found in human-disturbed sites. It is rather frequent in the Region.

The species is distributed as native in Eastern and Southern Europe, Central Asia (except Turkmenistan and Tajikistan), south-western Siberia, north-western China (western part of Xinjiang). It is known as alien in North America, Central, Western and Northern Europe.

Atriplex patens (Litv.) Iljin

- IPNI [urn:lsid:ipni.org:names:164043-1](https://www.ipni.org/names/164043-1)

Nomenclature:

Atriplex patens (Litv.) Iljin, Bull. Jard. Bot. Princ. URSS 26(4): 415 (1927) $\equiv$ *Atriplex littoralis* var. *patens* Litv., Sched. Herb. Fl. Ross. 5: 12 (1905).

– *Atriplex crassifolia* auct.: Knjazev (2009).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 21,000 km², AOO 32 km². This species is common in the south of Orenburg Region and has no tendency for declining.

Distribution: Orenburg Region (southern districts): Belyaevka, Ilek, Novoorsk, Pervomaiskii, Sol'-Iletsk, Svetlyi, Yasnyi Districts (Fig. 12). Northern limit of the native species distribution.

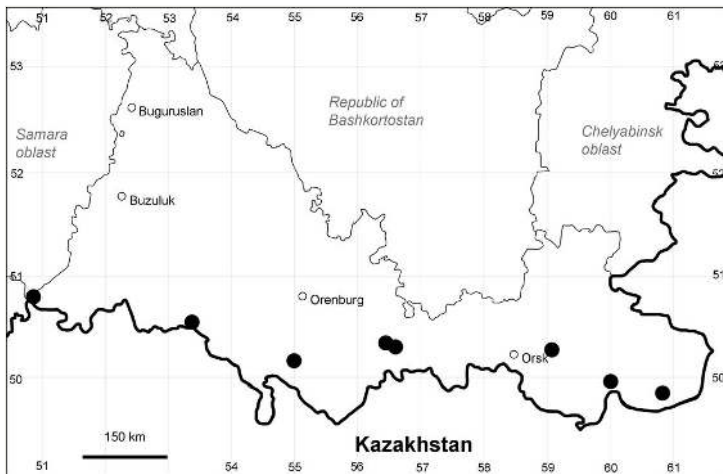


Figure 12. [doi](#)

Distribution map of *Atriplex patens* (confirmed occurrences).

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates. It is common in the southern part of the Region.

The species is distributed as native in Eastern Europe, North Caucasus, Central Asia (northern part), Siberia. It is known as alien in the forest zone of European Russia and the Russian Far East.

Atriplex patula L.

- IPNI [urn:lsid:ipni.org:names:26419-2](http://www.ipni.org/names/26419-2)

Nomenclature:

Atriplex patula L., Sp. Pl. 1: 1053 (1753).

Native status: Alien. Based on the scattered distribution and local occurrence, the residence status is likely casual (ephemeral or locally persisting). The earliest record (Orenburg City) is dated 1870s.

Conservation status: Not applicable.

Distribution: Orenburg Region: Buguruslan District, Orsk Town, Orenburg City (Fig. 13).

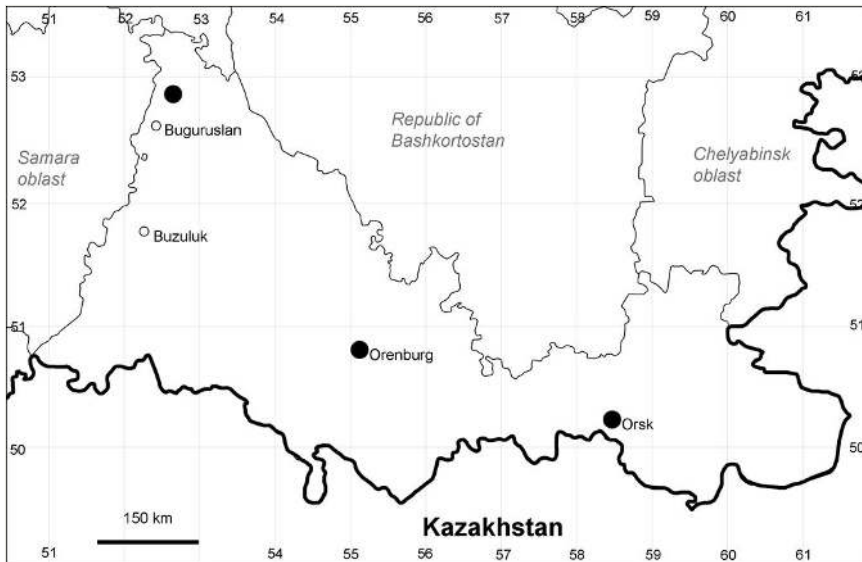


Figure 13. [doi](#)

Distribution map of *Atriplex patula*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species is found in ruderal habitats in populated places, mostly in direct connection with transport discharge areas.

The native distribution area is uncertain, but may cover Southern Europe and Mediterranean West Africa. The species is alien in temperate Eurasia, North and South America.

***Atriplex prostrata* Boucher ex DC.**

- IPNI [urn:lsid:ipni.org:names:60448217-2](https://www.ipni.org/names/60448217-2)

Nomenclature:

Atriplex prostrata Boucher ex DC. in Lam. & DC., Fl. Franc., ed. 3, 3: 387 (1805).

= *Atriplex latifolia* Wahlenb., Svensk Bot. 9: pl. 628 (1824).

– *Atriplex calotheca* auct.: Ryabinina (1998).

– *Atriplex hastata* auct.: Iljin (1930).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 51,790 km², AOO 44 km². This species is not rare in Orenburg Region and has no tendency for declining.

Distribution: Orenburg Region: Adamovka, Belyaevka, Buguruslan, Dombarovka, Gai, Grachevka, Kvarkeno, Kuvandyk, Sol'-Ilets Districts, Orenburg City (Fig. 14).

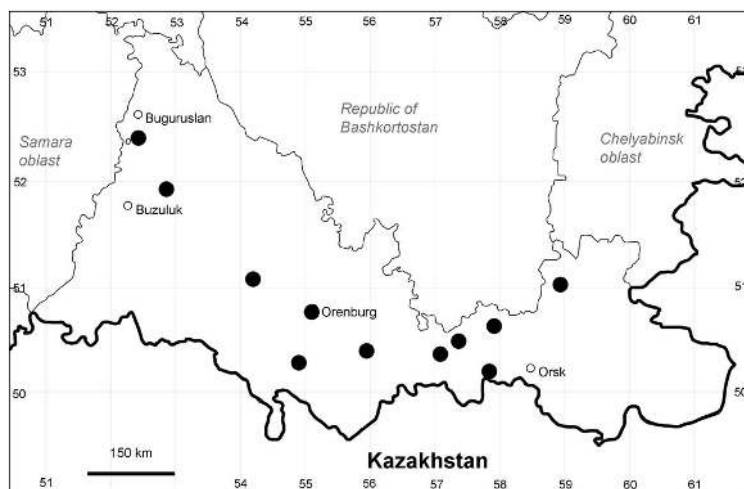


Figure 14. [doi](#)

Distribution map of *Atriplex prostrata*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates, along watercourses, also in human-disturbed sites. It is rather frequent in the Region.

The species is distributed as native in temperate Eurasia. It is found as alien in northern Africa, North and South America, southern Australia.

Atriplex sagittata Borkh.

- IPNI [urn:lsid:ipni.org:names:164128-1](http://www.ipni.org:8080/names/164128-1)

Nomenclature:

Atriplex sagittata Borkh., Rhein. Mag. Erweit. Naturk. 1: 477 (1793).

= *Atriplex nitens* Schkuhr, Bot. Handb. 3: 541 (1802).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 110,000 km², AOO 76 km². This species is very common in Orenburg Region and we assume its occurrence in all districts. It has no tendency for declining.

Distribution: Orenburg Region (whole territory): Akbulak, Belyaevka, Buguruslan, Gai, Grachevka, Krasnaya Gvardia, Kuvandyk, Kvarkeno, Pervomaiskii, Severnoe, Sol'-Iletsk, Sorochinsk, Svetlyi Districts, Orsk Town, Orenburg City (Fig. 15).

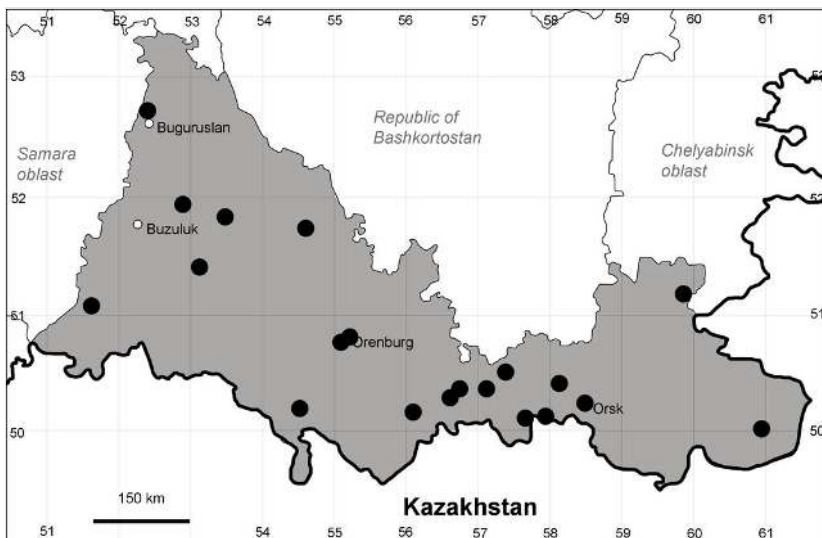


Figure 15. [doi](#)

Distribution map of *Atriplex sagittata*, verified (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs in steppes, meadows, along watercourses, also in human-disturbed sites. It is common in the Region.

The species is distributed as native in forest-steppes, steppes and semi-deserts of Eurasia and is widespread in the forest zone of Eurasia as an alien ruderal plant.

Atriplex sphaeromorpha Iljin

- IPNI [urn:lsid:ipni.org:names:77186039-1](https://www.ipni.org/names/77186039-1)

Nomenclature:

Atriplex sphaeromorpha Iljin, Izv. Glavnogo Bot. Sada 26(4): 414 (1927).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections.

Distribution: Orenburg Region: Tashla District (Fig. 16).

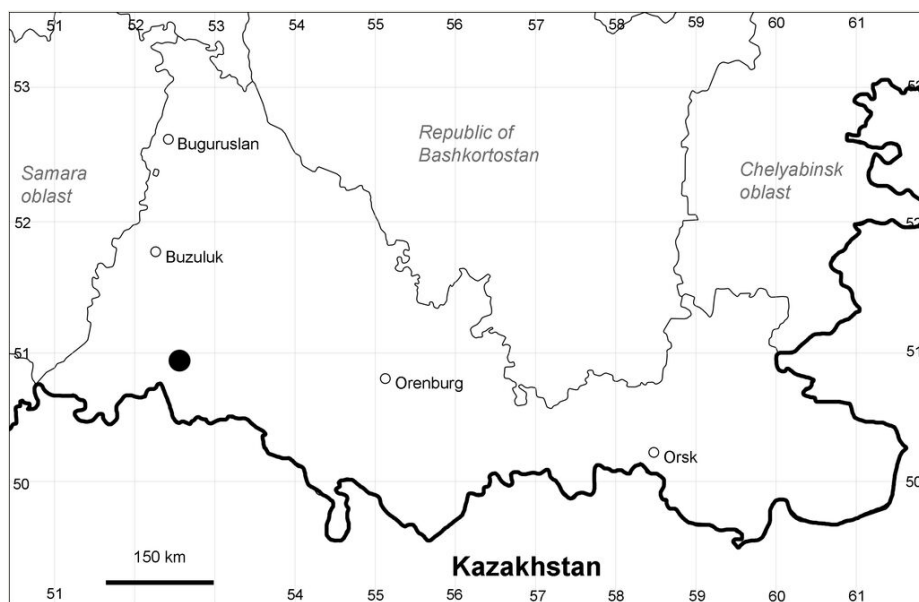


Figure 16. [doi](#)

Distribution map of *Atriplex sphaeromorpha*.

Previous reports: Ryabinina (1998), Knjazez (2009).

The species occurs in steppes, sometimes in human-disturbed sites. It is very rare in the Region, known only from a single collection dated 1930s.

The species is distributed in the southern part of Eastern Europe (southern part of European Russia, southern Ukraine) and Central Asia (Kazakhstan, Uzbekistan: northern part of Karakalpakstan). It is known as a casual alien in Germany and the forest zone of European Russia.

Atriplex tatarica L.

- IPNI [urn:lsid:ipni.org:names:164195-1](http://www.ipni.org:164195-1)

Nomenclature:

Atriplex tatarica L., Sp. Pl.: 1053 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 110,000 km², AOO 108 km². This common species is an apophyte in Orenburg Region, without a tendency to decline.

Distribution: Orenburg Region: Belyaevka, Buguruslan, Buzuluk, Dombarovka, Gai, Ilek, Kurmanaevka, Kuvandyk, Kvarkeno, Novosergievka, Perevolotskii, Sakmara, Severnoe, Sol'-Iletsk, Sorochinsk, Totskoe Districts, Orsk, Mednogorsk Towns, Orenburg City (Fig. 17).

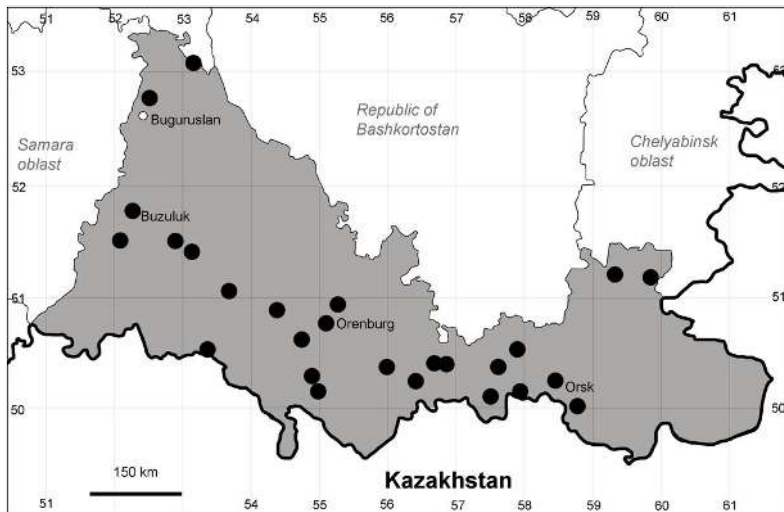


Figure 17. [doi](#)

Distribution map of *Atriplex tatarica*, verified (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates, also in human-disturbed sites. It is common in the Region.

The species is distributed as native in the Eastern Mediterranean and Eastern Europe, Caucasus, the Irano-Turanian Region. It is widely found as alien in Europe, North and South America.

***Chenopodium acerifolium* Andrz.**

- IPNI [urn:lsid:ipni.org:names:164748-1](https://www.ipni.org/names/164748-1)

Nomenclature:

Chenopodium acerifolium Andrz., Universitetskiye Izvestiya (Kiev) 7: 132 (1862).

= *Chenopodium album* var. *hastatum* C.Klinggr., Veg. Verh. Preuss. 2 Nachtr.: 130 (1866) ≡ *Chenopodium album* var. *klingsgraeffii* Abrom., Fl. Ost- u. Westpreussen 2(2): 712 (1917), nom. illeg. ≡ *Chenopodium klingsgraeffii* Aellen, Fedd. Repert. 26: 159 (1929).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections.

Distribution: Orenburg Region: Orenburg City (Fig. 18).

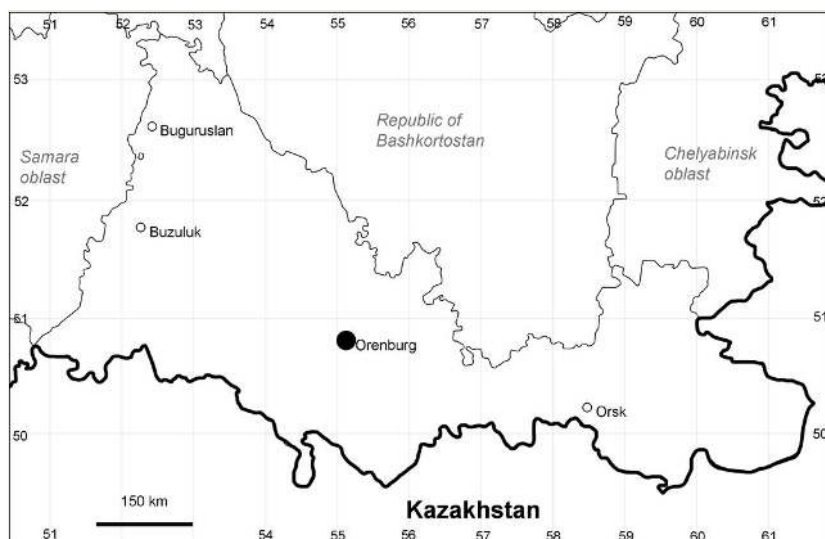


Figure 18. [doi](#)
Distribution map of *Chenopodium acerifolium*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs along riversides. It is known from the only old, undated specimen, first reported by Uotila and Lomonosova (2016).

The species is distributed in Eastern Europe and Siberia.

Chenopodium album L.

- IPNI [urn:lsid:ipni.org:names:55993-2](http://www.ipni.org:55993-2)

Nomenclature:

Chenopodium album L., Sp. Pl. 1: 219 (1753).

The circumscription of this critical taxon requires further studies.

Native status: Native.

Conservation status: Least Concern (LC).

EOO 107,000 km², AOO 92 km². This common species is an apophyte in Orenburg Region, without a tendency to decline.

Distribution: Orenburg Region (whole territory): Buguruslan, Buzuluk, Gai, Kvarkeno, Kuvandyk, Novoorsk, Novosergievka, Saraktash, Sol'-Iletsk, Sorochinsk, Tashla, Tyulgan Districts, Orsk Town, Orenburg City (Fig. 19).

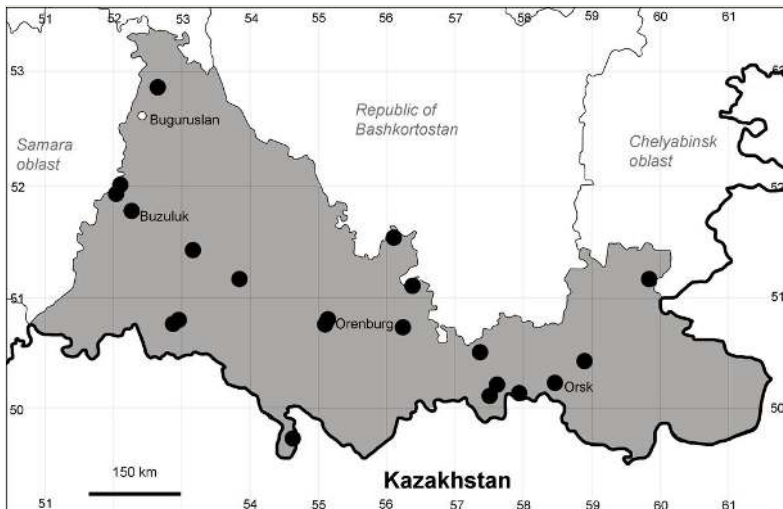


Figure 19. [doi](#)

Distribution map of *Chenopodium album*, confirmed (points) and projected (shade) occurrence.

Previous records: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on disturbed lands. It is very common in the Region.

The species is widely distributed in the temperate zone of Eurasia and is found as alien in other continents.

Chenopodium betaceum Andrz.

- IPNI [urn:lsid:ipni.org:names:164812-1](https://www.ipni.org/names/164812-1)

Nomenclature:

Chenopodium betaceum Andrz., Universitetskiye Izvestiya (Kiev) 7: 132 (1862).

= *Chenopodium striatiforme* Murr, Deutsche Bot. Monatsschr. 19: 51 (1901).

– *Chenopodium strictum* auct.: Ryabinina (1998), Mosyakin (1996).

Native status: Native.

Conservation status: Data Deficient (DD).

EOO 2,000 km², AOO 12 km². This species seems to be commonly overlooked by collectors. We agree with previous estimations (Ryabinina 1998, Knjazez 2009) that its actual occurrence should be much broader. For this reason, a threatened category has not been assigned.

Distribution: Orenburg Region: Buzuluk, Sorochinsk Districts, Orenburg City (Fig. 20).

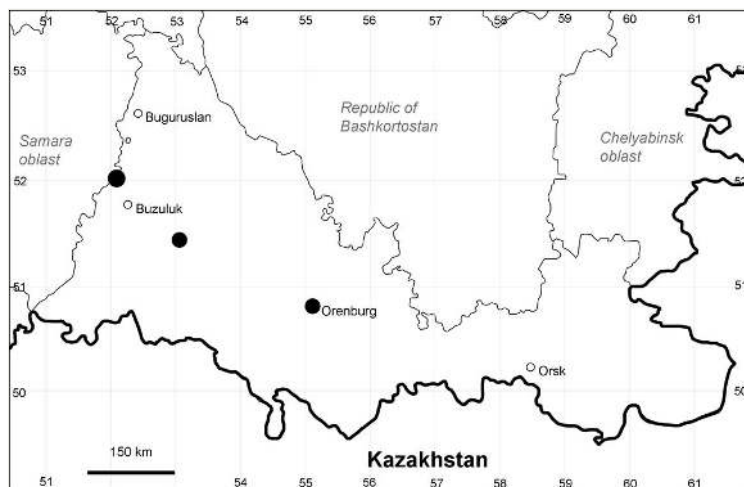


Figure 20. [doi](#)

Distribution map of *Chenopodium betaceum* (confirmed occurrence).

Previous records: Ryabinina (1998), Knjazez (2009), as *C. strictum* and *C. striatiforme*.

The species occurs on sands, along riversides and waterbodies, also in human-disturbed sites. It seems to occur sporadically in the region, mostly overlooked by collectors. Knjazez (2009) reported its occurrence in all districts of Orenburg Region.

The species is distributed in temperate Eurasia (eastwards to West Siberia).

Chenopodium opulifolium Schrad. ex W.D.J.Koch & Ziz

- IPNI [urn:lsid:ipni.org:names:60447126-2](http://www.ipni.org:5000/ipni/idiplant/urn:lsid:ipni.org:names:60447126-2)

Nomenclature:

>***Chenopodium opulifolium*** Schrad. ex W.D.J.Koch & Ziz, Cat. Pl. Palat.: 6 (1814).

The earliest valid publication of a name for this taxon, albeit at the rank of variety (*C. rubrum* var. *opulifolium* Schweigg.), was effected by A.F. Schweigger, based on the material received from the Botanical Garden in Paris (Schweigger 1812, p. 24).

Native status: Native.

Conservation status: Data Deficient (DD).

EOO and AOO not calculated. This species is an apophyte and, therefore, its actual occurrence may be wider in the territory. For this reason, a threatened category has not been assigned.

Distribution: Orenburg Region: Oktjabrskoe District, Orenburg City (Fig. 21).

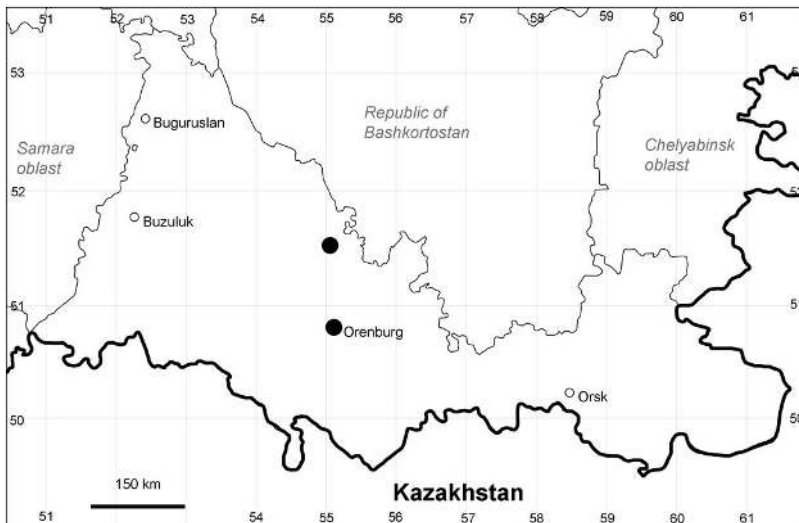


Figure 21. [doi](#)

Distribution map of *Chenopodium opulifolium*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on sands and also in human-disturbed sites. It is rare in the Region.

The species is distributed in Europe and Northern Africa.

***Chenopodium virgatum* Thunb.**

- IPNI [urn:lsid:ipni.org:names:165300-1](https://nbn-resolving.org/urn:lsid:ipni.org:names:165300-1)

Nomenclature:

Chenopodium virgatum Thunb., Nova Acta Reg. Soc. Sci. Upsal. 7: 143 (1815).

In the taxonomic interpretation of this species name, we follow Uotila (2001).

Native status: Casual alien.

Conservation status: Not applicable.

Distribution: Orenburg Region: Sol'-Iletsk District (Fig. 22).

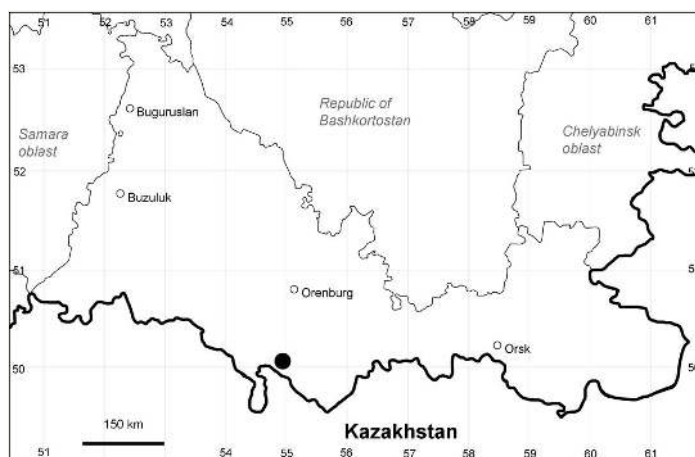


Figure 22. [doi](#)

Distribution map of *Chenopodium virgatum*.

The species occurs on sands, in human-disturbed sites. It is first reported from the only locality here: 1 km E of Trudovoe, 28 Sep 2020, A. Sukhorukov, N. Stepanova & O. Kalmykova 494 (MW).

The species is distributed in temperate Asia (Russia, China, Mongolia).

***Chenopodiastrum hybridum* (L.) S.Fuentes, Uotila & Borsch**

- IPNI [urn:lsid:ipni.org:names:77121009-1](https://nbn-resolving.org/urn:lsid:ipni.org:names:77121009-1)

Nomenclature:

Chenopodiastrum hybridum (L.) S.Fuentes, Uotila & Borsch, Willdenowia 42(1): 14 (2012) $\equiv$ *Chenopodium hybridum* L., Sp. Pl. 1: 219 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 72,700 km², AOO 64 km². This common species presumably occurs through the whole territory of Orenburg Region, without a tendency to decline.

Distribution: Orenburg Region (whole territory): Asekeevo, Buguruslan, Buzuluk, Gai, Ilek, Kuvandyk, Novoorsk, Novosergievka, Tashla Districts, Orenburg City (Fig. 23).

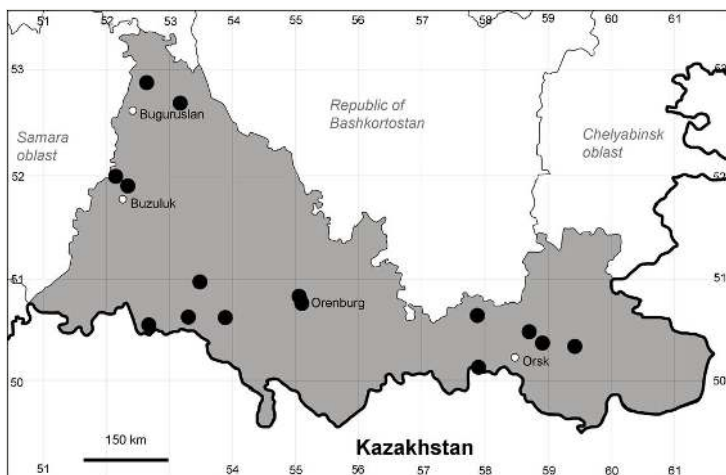


Figure 23. [doi](#)

Distribution map of *Chenopodiastrium hybridum*, confirmed (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs in human-disturbed sites. It is common in the Region.

The species is distributed in temperate Eurasia.

Halimione pedunculata (L.) Aellen

- IPNI [urn:lsid:ipni.org:names:165654-1](http://www.ipni.org:urn:lsid:ipni.org:names:165654-1)

Nomenclature:

Halimione pedunculata (L.) Aellen, Verh. Naturf. Ges. Basel 49: 123 (1938) ≡ *Atriplex pedunculata* L., Fl. Angl.: 25 (1754).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 8,150 km², AOO 20 km². The species is locally common and further localities are expected.

Distribution: Orenburg Region (southern districts): Akbulak, Belyaevka, Sol'-Iletsk, Svetlyi Districts, Orsk Town (Fig. 24). Northern limit of the species distribution.

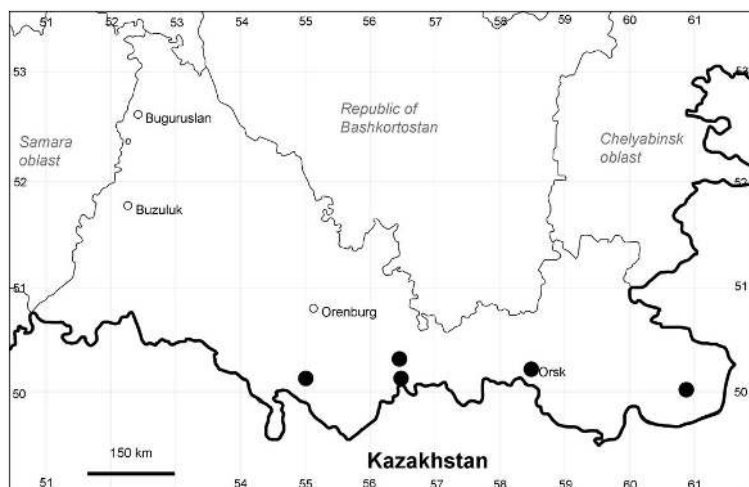


Figure 24. doi

Distribution map of *Halimione pedunculata*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on saline substrates. It is found sporadically in the Region.

The species is distributed in Western, Central and Eastern (southern part) Europe, south-western Siberia and Central Asia (Kazakhstan, Uzbekistan).

***Halimione verrucifera* (M.Bieb.) Aellen**

- IPNI [urn:lsid:ipni.org:names:165656-1](https://www.ipni.org/names/165656-1)

Nomenclature:

Halimione verrucifera (M.Bieb.) Aellen, Verh. Naturf. Ges. Basel 49: 121 (1938) $\equiv$ *Atriplex verrucifera* M.Bieb., Fl. Taur.-Cauc. 2: 441 (1808).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 83,000 km², AOO 76 km². This species occurs almost in the whole territory. No decline is observed.

Distribution: Orenburg Region (except northernmost districts): Adamovka, Belyaevka, Buzuluk, Dombarovka, Gai, Ilek, Kvarkeno, Novoorsk, Novosergievka, Pervomaiskii, Sol'-Iletsk, Svetlyi, Tashla Districts, Orsk Town (Fig. 25).

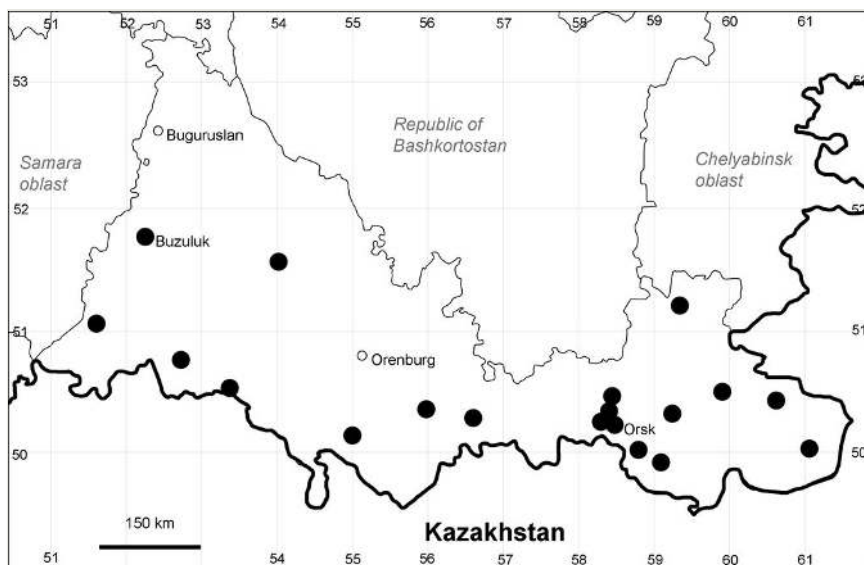


Figure 25. [doi](#)

Distribution map of *Halimione verrucifera*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates. It is common in the Region.

The species is distributed in Eastern Europe (southern part), West Asia (Turkey), Caucasus, Central Asia (Kazakhstan, Uzbekistan, Kyrgyzstan), China (Xinjiang).

Lipandra polysperma (L.) S.Fuentes, Uotila & Borsch

- IPNI [urn:lsid:ipni.org:names:77121012-1](http://www.ipni.org/names/77121012-1)

Nomenclature:

Lipandra polysperma (L.) S.Fuentes, Uotila & Borsch, Willdenowia 42(1): 14 (2012) ≡ *Chenopodium polyspermum* L., Sp. Pl. 1: 220 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 56,300 km², AOO 56 km². The species is not rare in Orenburg Region. No decline is observed.

Distribution: Orenburg Region: Belyaevka, Buguruslan, Buzuluk, Gai, Ilek, Kuvandyk, Ponomaryovka, Sol'-Iletsk Districts, Orenburg City (Fig. 26).

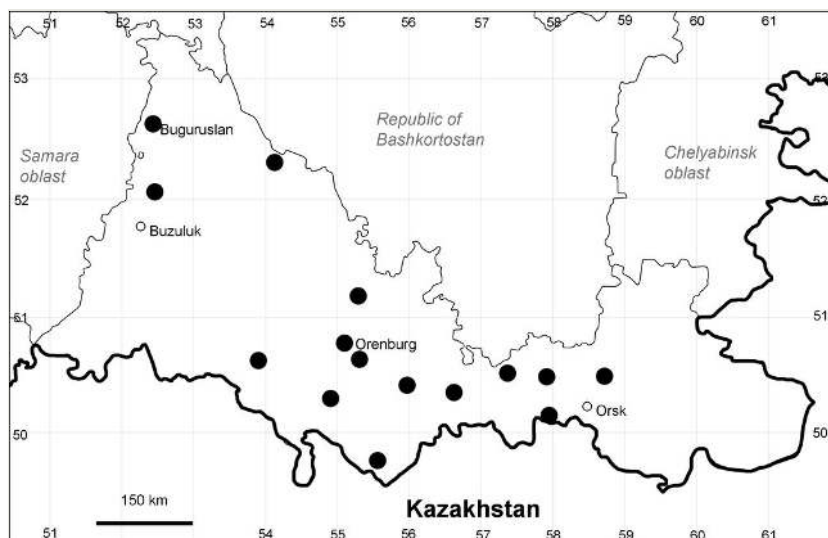


Figure 26. [doi](#)

Distribution map of *Lipandra polysperma*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates, along watercourses and waterbodies. It was found sporadically in the Region.

The species is distributed as native in Eurasia. It was found as alien and naturalised in North America, South Africa and Australia.

***Oxybasis chenopodioides* (L.) S.Fuentes, Uotila & Borsch**

- IPNI [urn:lsid:ipni.org:names:77121017-1](http://www.ipni.org/names/77121017-1)

Nomenclature:

Oxybasis chenopodioides (L.) S.Fuentes, Uotila & Borsch, Willdenowia 42(1): 15 (2012) ≡ *Chenopodium chenopodioides* (L.) Aellen, Ostenia: 98 (1933) ≡ *Blitum chenopodioides* L., Mant. Pl. Altera: 170 (1771).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 42,350 km², AOO 32 km². The species widely occurs in the territory. No decline is observed.

Distribution: Orenburg Region (central and eastern districts): Akbulak, Gai, Sharlyk, Sol'-Iletsk, Svetlyi, Yasnyi Districts (Fig. 27).

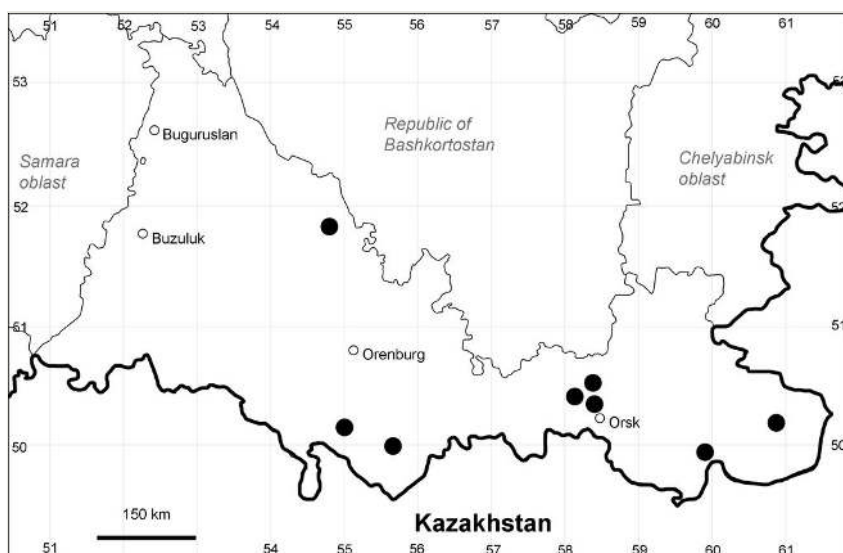


Figure 27. [doi](#)

Distribution map of *Oxybasis chenopodioides*.

Previous reports: Ryabinina (1998), Knjazez (2009).

The species occurs on saline substrates. It is frequent in the Region.

The species is distributed as native in Europe, West Asia, eastern Mediterranean, Central Asia (Kazakhstan). It is known as alien in East and South Africa, North and South America.

Oxybasis glauca (L.) S.Fuentes, Uotila & Borsch

- IPNI [urn:lsid:ipni.org:names:77121014-1](http://www.ipni.org/names/77121014-1)

Nomenclature:

Oxybasis glauca (L.) S.Fuentes, Uotila & Borsch, Willdenowia 42(1): 15 (2012) $\equiv$ *Chenopodium glaucum* L., Sp. Pl. 1: 220 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 41,600 km², AOO 28 km². The species is found in several places in the territory and a wider occurrence was indicated by Knjazez (2009). No decline is observed.

Distribution: Orenburg Region: Asekeevo, Belyaevka, Buzuluk, Gai, Ttoskoe Districts, Orenburg City (Fig. 28).

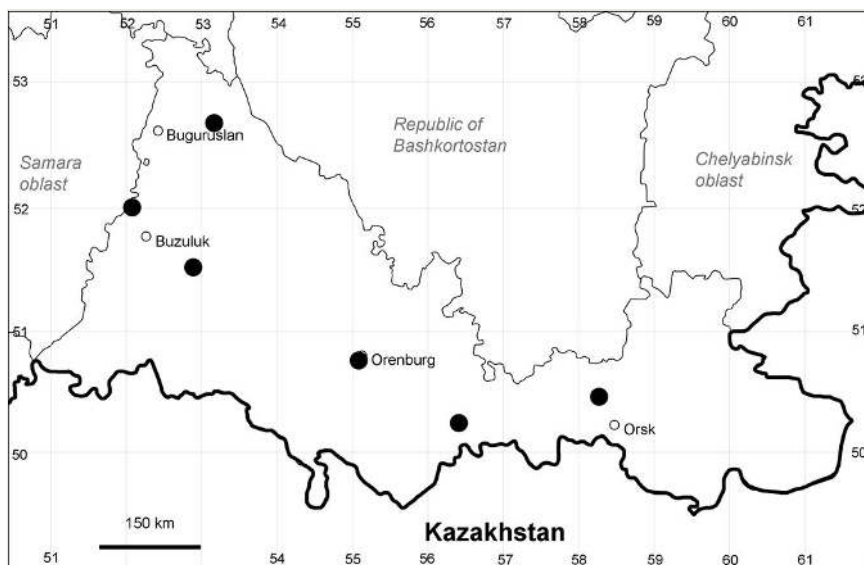


Figure 28. [doi](#)

Distribution map of *Oxybasis glauca*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs along watercourses and waterbodies and also on human-disturbed and ruderal sites. It is found sporadically in the Region.

The species is distributed as native in Eurasia and North America. It is found as alien in Australia.

***Oxybasis rubra* (L.) S.Fuentes, Uotila & Borsch**

- IPNI [urn:lsid:ipni.org:names:77121013-1](http://www.ipni.org/names/77121013-1)

Nomenclature:

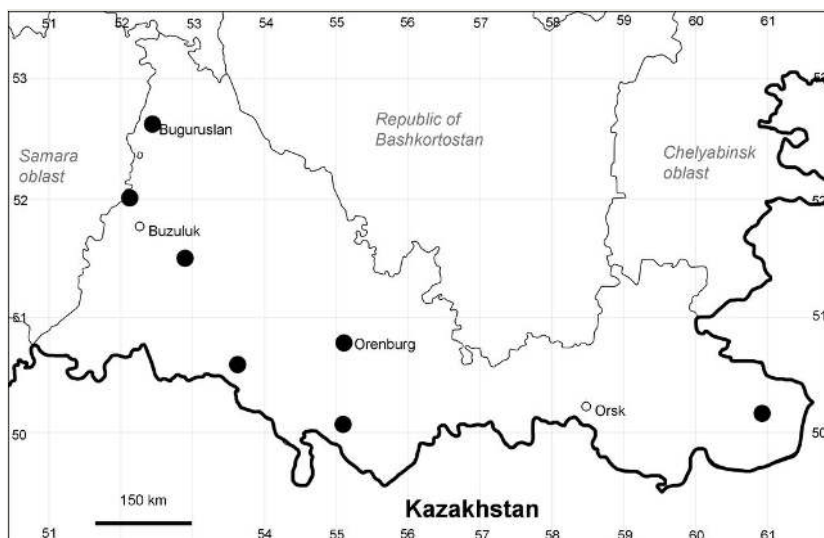
Oxybasis rubra (L.) S.Fuentes, Uotila & Borsch, Willdenowia 42(1): 15 (2012) ≡ *Chenopodium rubrum* L., Sp. Pl. 1: 218 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 74,400 km², AOO 36 km². The species is found in several places in the territory and a wider occurrence was indicated by Knjazez (2009). No decline is observed.

Distribution: Orenburg Region: Buguruslan, Buzuluk, Ilek, Sol'-Iletsk, Svetlyi, Totkskoe Districts, Orenburg City (Fig. 29).

Figure 29. [doi](#)Distribution map of *Oxybasis rubra*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009)

The species occurs along watercourses and waterbodies and also on human-disturbed and ruderal sites. It is found sporadically in the Region.

The species is distributed as native in temperate Eurasia and North Africa. It is found as alien in North America.

Oxybasis urbica (L.) S.Fuentes, Uotila & Borsch

- IPNI [urn:lsid:ipni.org:names:77121015-1](https://nbn-resolving.org/urn:lsid:ipni.org:names:77121015-1)

Nomenclature:

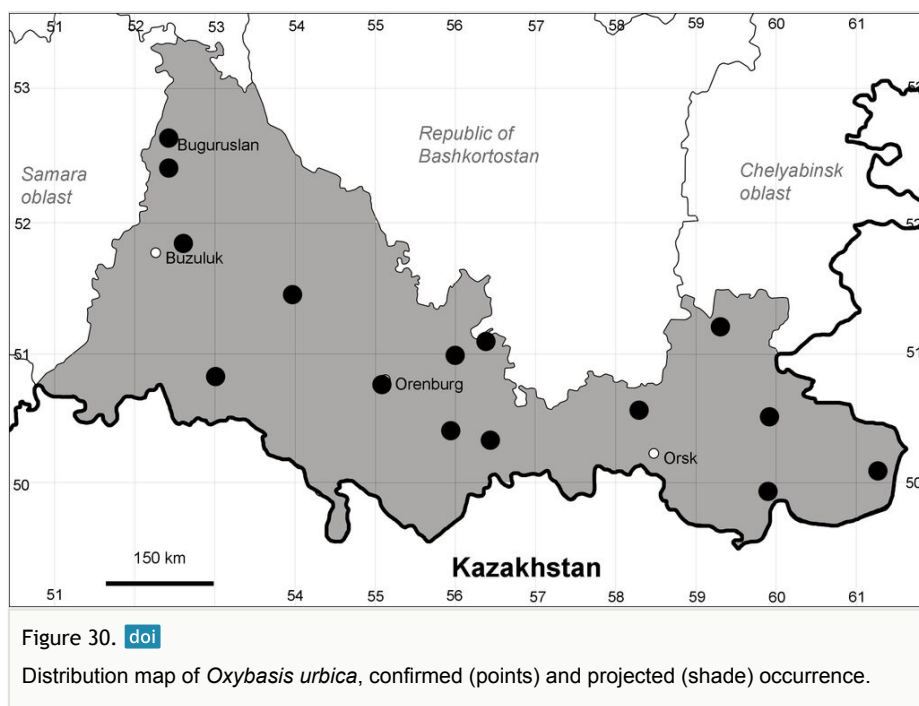
Oxybasis urbica (L.) S.Fuentes, Uotila & Borsch, Willdenowia 42(1): 15 (2012) ≡ *Chenopodium urbicum* L., Sp. Pl. 1: 218 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 86,600 km², AOO 60 km². This common species presumably occurs through the whole territory of Orenburg Region, without a tendency to decline.

Distribution: Orenburg Region (whole territory): Adamovka, Belyaevka, Buguruslan, Buzuluk, Gai, Kvarkeno, Novosergievka, Saraktash, Svetlyi, Tashla, Yasnyi Districts, Orenburg City (Fig. 30).



Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs in steppes, and also on human-disturbed and ruderal sites. It is common in the Region.

The species is distributed in steppes and semi-deserts of temperate Eurasia.

***Axyris amaranthoides* L.**

- IPNI [urn:lsid:ipni.org:names:164269-1](https://www.ipni.org/names/164269-1)

Nomenclature:

***Axyris amaranthoides* L., Sp. Pl. 2: 979 (1753).**

Native status: Established alien.

Conservation status: Not applicable.

Distribution: Orenburg Region: Abdulino, Adamovka, Buzuluk, Saraktash, Tashla Districts, Orsk Town, Orenburg City (Fig. 31).

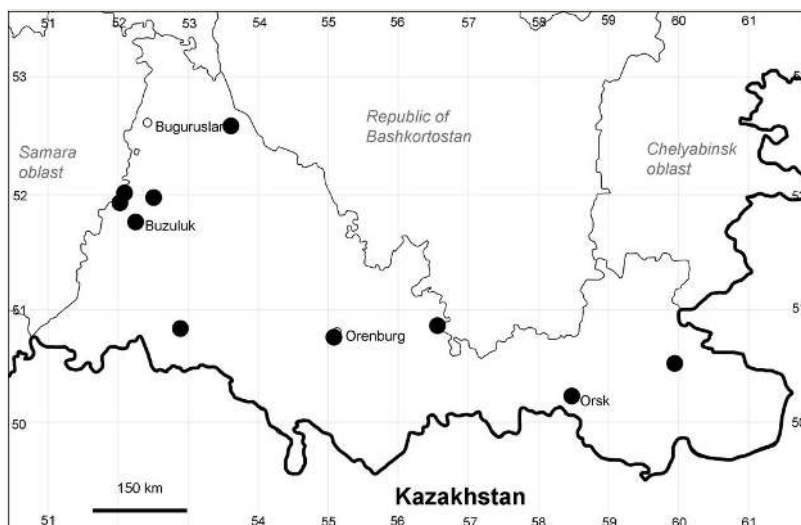


Figure 31. [doi](#)
Distribution map of *Axyris amaranthoides*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs mostly in human-disturbed sites. It is sporadically found in the Region.

The species is distributed as native in Asiatic Russia and Central Asia. It is known as alien in Western, Central and Eastern Europe, the Russian Far East and North America.

Ceratocarpus arenarius L.

- IPNI [urn:lsid:ipni.org:names:164656-1](http://www.ipni.org/names/164656-1)

Nomenclature:

***Ceratocarpus arenarius* L., Sp. Pl. 1: 969 (1753).**

Native status: Native.

Conservation status: Least Concern (LC).

EOO 101,250 km², AOO 100 km². This common species presumably occurs through the whole territory of Orenburg Region, without a tendency to decline.

Distribution: Orenburg Region (whole territory): Akbulak, Asekeev, Belyaevka, Buguruslan, Buzuluk, Gai, Ilek, Kuvandyk, Kvarkeno, Novosergievka, Saraktash, Sol'-Iletsk, Totokoe Districts, Orsk, Mednogorsk Towns, Orenburg City (Fig. 32).

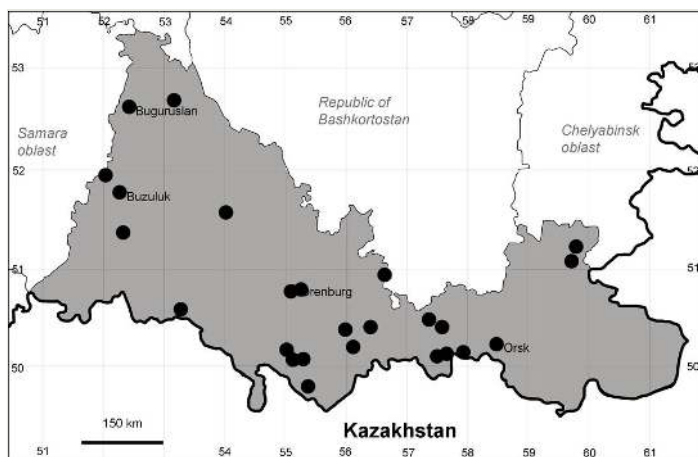


Figure 32. [doi](#)

Distribution map of *Ceratocarpus arenarius*, confirmed (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on sands, limestones, in degraded steppes and also in human-disturbed sites. It is common in the Region.

The species is distributed in steppes and deserts of Eurasia.

***Krascheninnikovia ceratoides* (L.) Gueldenst.**

- IPNI [urn:lsid:ipni.org:names:166043-1](http://www.ipni.org/names/166043-1)

Nomenclature:

Krascheninnikovia ceratoides (L.) Gueldenst., Nov. Comm. Ac. Sci. Petrop. 16: 555 (1772) $\equiv$ *Axyris ceratoides* L., Sp. Pl. 2: 979 (1753) $\equiv$ *Eurotia ceratoides* (L.) C.A.Mey. in Ledeb., Fl. Altaic. 4: 239 (1833).

= *Ceratospermum papposum* Pers., Syn. Pl. 2(2): 552 (1807), nom. illeg. $\equiv$ *Ceratoides papposa* Botsch. & Ikonn., Nov. Sist. Vyssh. Rast. 6: 267 (1970).

= *Eurotia lenensis* Kuminova, Sist. Zametki Mater. Gerb. Krylova Tomsk. Gosud. Univ. 1-2: 3 (1939) $\equiv$ *Krascheninnikovia lenensis* (Kuminova) Tzvelev in Ukr. Bot. Zhurn. 50(1): 78 (1993).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 92,150 km², AOO 140 km². This common species presumably occurs through the whole territory of Orenburg Region, without a tendency to decline. A broader occurrence was indicated by Knjazev (2009).

Distribution: Orenburg Region (whole territory): Abdulino, Adamovka, Asekeevo, Belyaevka, Buguruslan, Buzuluk, Dombarovskii, Gai, Grachevka, Krasnaya Gvardia, Kurmanaevka, Kuvandyk, Novoorsk, Novosergievka, Orsk, Perevolotskii, Ponomarevka, Sakmara, Sol'-Iletsk, Sorochinsk, Tashla, Tyulgan Districts, Orenburg City (Fig. 33).

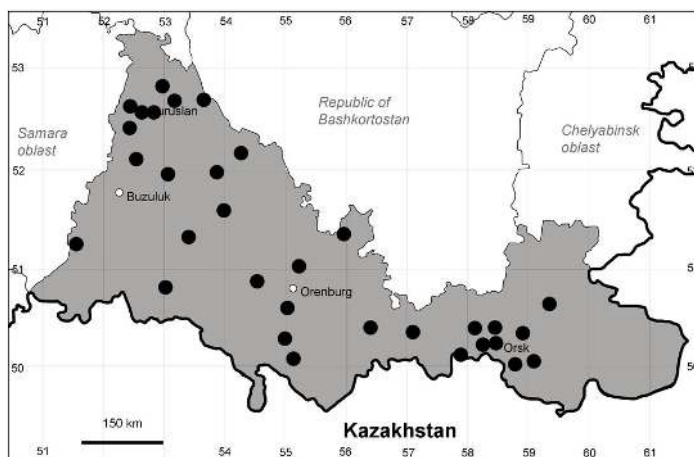


Figure 33. [doi](#)

Distribution map of *Krascheninnikovia ceratoides*, confirmed (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs in steppes, on limestone. It is common in the Region.

The species is distributed in steppes and deserts of Eurasia, the Himalayas, Tibet, northern Africa, North America (subsp. *lanata* (Pursh) Heklau).

***Agriophyllum pungens* (Vahl) Link**

- IPNI [urn:lsid:ipni.org:names:163348-1](http://www.ipni.org/names/163348-1)

Nomenclature:

Agriophyllum pungens (Vahl) Link, Handbuch 2: 408 (Jun 1831); A. Dietr., Sp. Pl. 1: 124 (Oct 1831) $\equiv$ *Corispermum pungens* Vahl, Enum. Pl. 1: 17 (1804) $\equiv$ *Agriophyllum arenarium* M.Bieb. ex C.A.Mey., Verz. Pfl. Cauc. Casp. Meer: 163 (Nov 1831), nom. illeg. superfl.

– *Agriophyllum squarrosum* auct.: Iljin (1930), Gusev (1996), Ryabinina (1998), Knjazez (2009).

Marschall von Bieberstein (1819) introduced the species name *Agriophyllum pungens* in discussions under *Corispermum pungens*, indicating that it will be separated as a genus in the future. Czerepanov (1973) disregarded this statement as valid publication

of the genus and species combination, apparently because of their provisional acceptance by the original author. He decided that the genus name was validly published by Meyer (1831) who merely accepted the genus with a reference to Bieberstein. However, Czerepanov failed to observe that Bieberstein described and discussed the species, but provided no description or diagnosis of the genus; besides, other authors accepted this genus name earlier than Meyer. Link (1831) was the first to accept the genus and provide its validating description, together with a combination for its only species. His work was published (according to contemporary announcements in *Staats- und Gelehrte Zeitung des Hamburgischen unpartheyischen Correspondenten* and *Kölnischer Correspondent*) by the beginning of June, whereas another book with the same taxonomic content (Dietrich 1831) was published in October (according to contemporary weekly bibliographies: *Bibliographie von Deutschland*). The work of Meyer (1831) was printed in November, according to internal evidence.

Native status: Native.

Conservation status: Least Concern (LC).

EOO 18,150 km², AOO 16 km². The species is known from a few scattered localities. Knjazev (2009) reported the occurrence in one more district in the south.

Although the species is rare in the territory, it occurs in open sands which are currently not threatened by human activity. As long as these landscapes are not in danger, we assess the conservation status of this species in Orenburg Region as Least Concern.

Distribution: Orenburg Region: Ilek, Sol'-Iletsk Districts, Orsk Town, Orenburg City (Fig. 34). Northern limit of the species distribution.

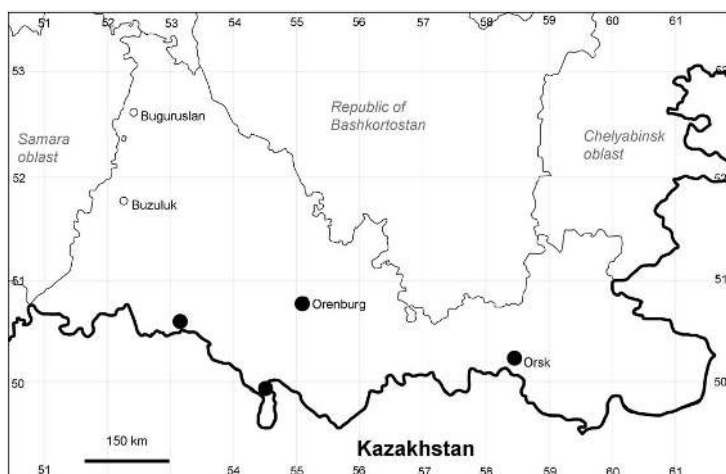


Figure 34. [doi](#)

Distribution map of *Agriophyllum pungens*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on sands. It is very rare in the southern part of the Region.

The species is distributed in Iran, the Caucasus, Central Asia.

***Corispermum declinatum* Stephan ex Iljin**

- IPNI [urn:lsid:ipni.org:names:165376-1](http://www.ipni.org:8080/names/165376-1)

Nomenclature:

Corispermum declinatum Stephan ex Iljin, Trydy Prikl. Bot. Gen. Selektiv. 19(2): 69 (1928).

Native status: Naturalised alien.

Conservation status: Not applicable.

Distribution: Orenburg Region: Aleksandrovka, Asekeevo, Grachevka, Kurmanaevka, Novosergievka, Perevolotskii, Tashla Districts, Orsk Town (Fig. 35).

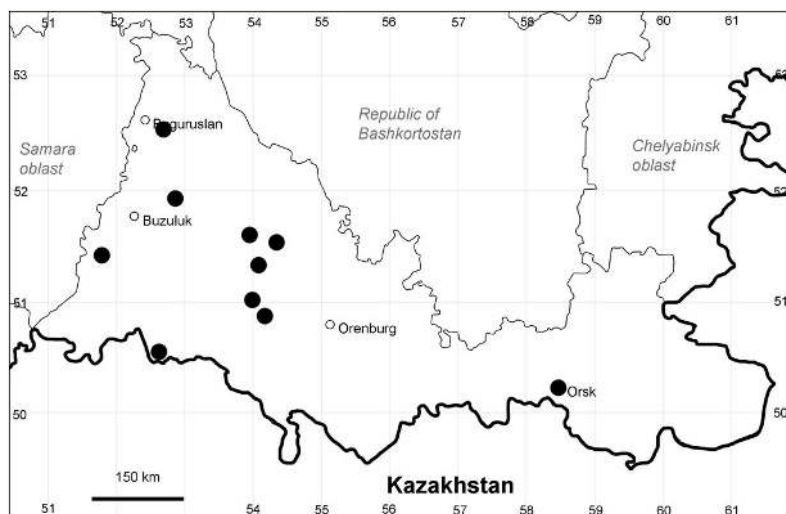


Figure 35. [doi](#)

Distribution map of *Corispermum declinatum*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on sands. It is rather frequent in the Region.

The species is distributed as native in Eastern Europe (south-eastern part), southern Siberia and Central Asia. It is known as alien in Western, Central and Eastern Europe and the Russian Far East.

Corispermum hyssopifolium L.

- IPNI [urn:lsid:ipni.org:names:327166-2](http://www.ipni.org:5000/names/327166-2)

Nomenclature:

Corispermum hyssopifolium L., Sp. Pl. 1: 4 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 4,000 km², AOO 12 km². Despite its rarity and limited occurrence, the species is not threatened. Its habitats are not under the risk of destruction or degradation and further records may be expected when the territory is better explored.

Distribution: Orenburg Region (western districts): Buzuluk, Sorochinsk Districts (Fig. 36).

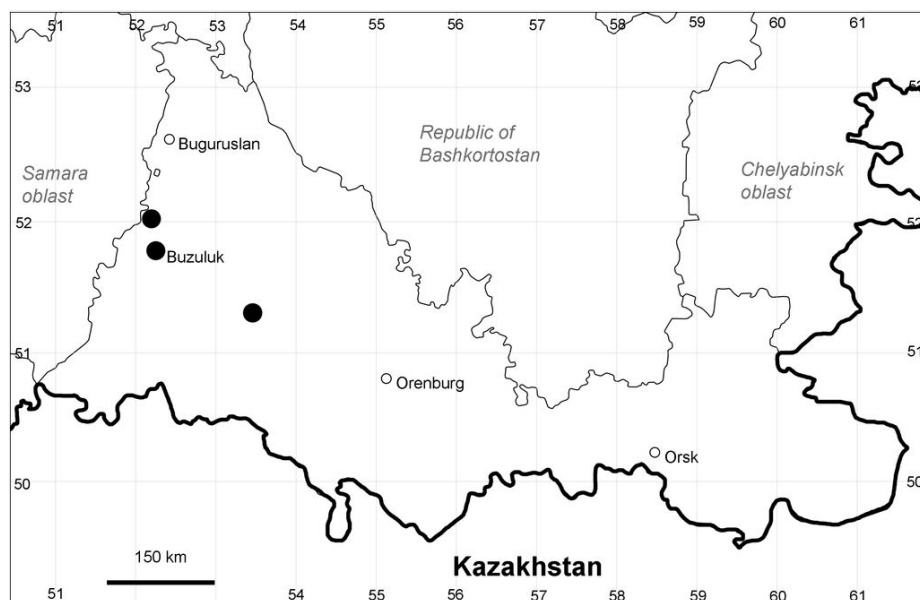


Figure 36. [doi](#)
Distribution map of *Corispermum hyssopifolium*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on sands.

The species is distributed in Eastern Europe (south-eastern part), Western Siberia (southern part), Kazakhstan (north-western part).

Corispermum laxiflorum Schrenk

- IPNI [urn:lsid:ipni.org:names:165410-1](http://www.ipni.org:5000/ipni/urn:lsid:ipni.org:names:165410-1)

Nomenclature:

Corispermum laxiflorum Schrenk, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Pétersbourg 1: 361 (1843).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections.

Distribution: Orenburg Region: Tashla District (Fig. 37).

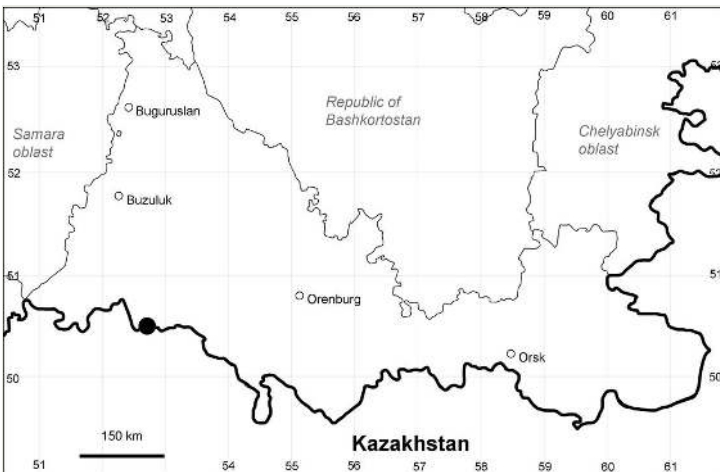


Figure 37. [doi](https://doi.org/10.26907/2541-7849.2023.1.0037)

Distribution map of *Corispermum laxiflorum*.

The species occurs on sands. The species is known from the only record in the Region, first reported here: Irtetskii [Irték], 28.08.1928, A.Borisova 1704 (LE).

The species is distributed in Eastern Europe (Russia: Saratov and Orenburg Regions) and Central Asia (Kazakhstan, Uzbekistan).

Corispermum marschallii Steven

- IPNI [urn:lsid:ipni.org:names:165419-1](http://www.ipni.org:5000/ipni/urn:lsid:ipni.org:names:165419-1)

Nomenclature:

Corispermum marschallii Steven, Mém. Soc. Imp. Naturalistes Moscou 5: 336 (1814).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections. A broader occurrence is reported by Knjazez (2009).

Distribution: Orenburg Region: Buzuluk District (Fig. 38).

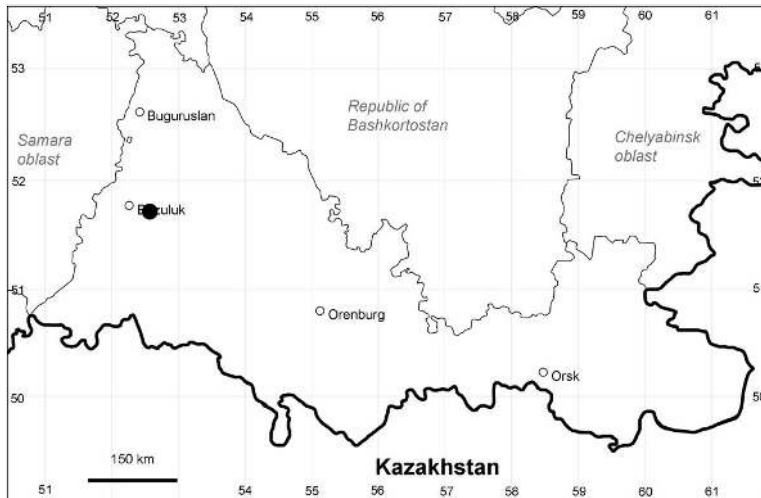


Figure 38. [doi](#)

Distribution map of *Corispermum marschallii*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on sands and is distributed in Central and Eastern Europe.

***Corispermum squarrosus* L.**

- IPNI [urn:lsid:ipni.org:names:165456-1](http://www.ipni.org/names/165456-1)

Nomenclature:

***Corispermum squarrosus* L.**, Sp. Pl. 1: 4 (1753).

= *Corispermum squarrosus* subsp. *uralense* Iljin, Izv. Glavn. Bot. Sada SSSR 28: 651 (1929) ≡ *Corispermum uralense* (Iljin) Aellen, Fedd. Repert. 69: 144 (1964).

– *Corispermum orientale* auct.: Iljin (1930), Mosyakin (1996), Ryabinina (1998), Knjazez (2009).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned because the collection data seem to be highly incomplete. Knjazez (2009) reported a broader occurrence in the territory.

Distribution: Orenburg Region: Sakmara District, Orenburg City (Fig. 39).

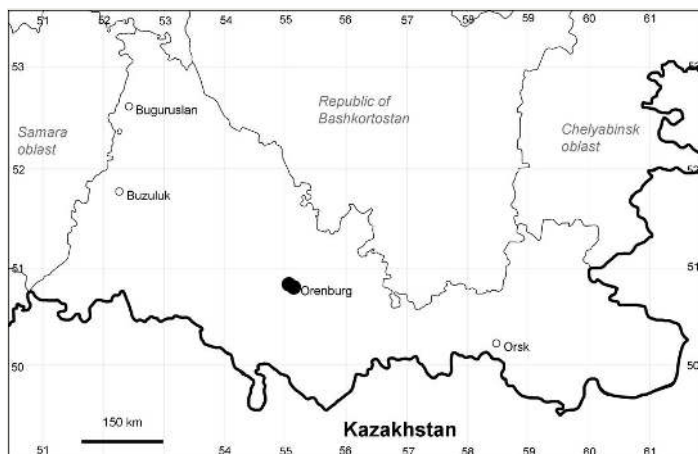


Figure 39. [doi](#)
Distribution map of *Corispermum squarrosum*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009), also as *C. orientale*.

The species occurs on sands. It may be rather common along the Ural River and its main tributaries.

The species is distributed in Eastern Europe (south-eastern part: Orenburg Region), West Siberia (southern part) and Kazakhstan (north-western part).

***Halocnemum strobilaceum* (Pall.) M.Bieb.**

- IPNI [urn:lsid:ipni.org:names:165766-1](http://www.ipni.org/names/165766-1)

Nomenclature:

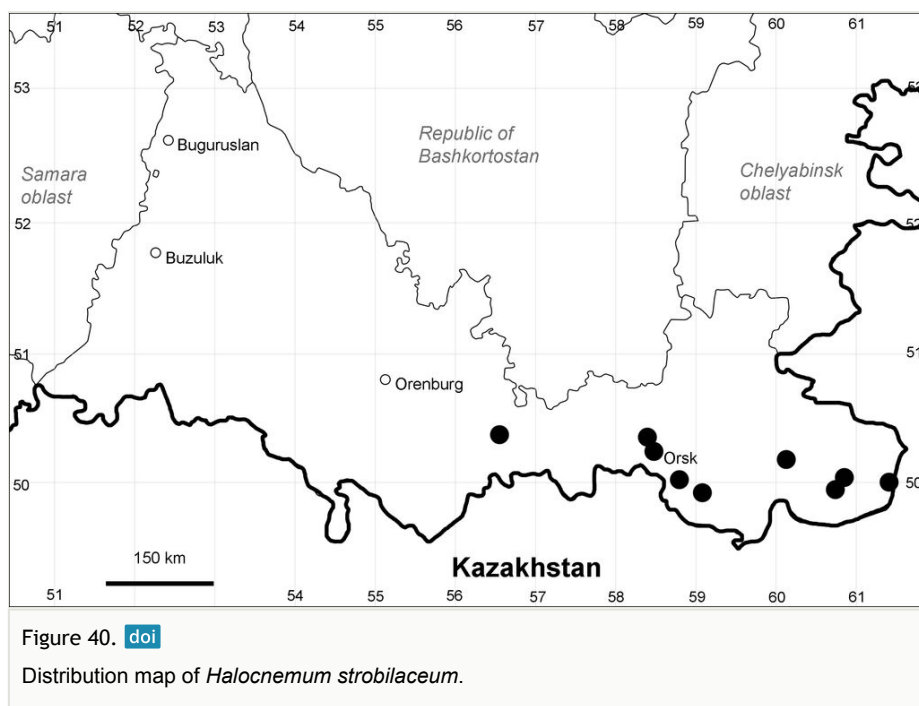
Halocnemum strobilaceum (Pall.) M.Bieb., Fl. Taur.-Cauc. 3: 3 (1819) ≡ *Salicornia strobilacea* Pall., Reise 1: 412 (1771).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 7,700 km², AOO 36 km². This species is restricted to the southern parts of the territory, but is not threatened.

Distribution: Orenburg Region (south-eastern districts): Belyaevka, Dombarovka, Gai, Orsk, Svetlyi, Yasnyi Districts, Orsk Town (Fig. 40).



Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on solonchaks. It is found in the south-eastern part of the Region.

The species is distributed in arid areas of Eurasia.

***Kalidium caspicum* (L.) Ung.-Sternb.**

- IPNI [urn:lsid:ipni.org:names:165908-1](http://www.ipni.org/urn:lsid:ipni.org:names:165908-1)

Nomenclature:

Kalidium caspicum (L.) Ung.-Sternb., Atti Congr. Bot. Firenze 1874: 317 (1876) ≡ *Salicornia caspica* L., Sp. Pl. 1: 4 (1753).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections.

Distribution: Orenburg Region: Sol'-Iletsk District (Fig. 41).

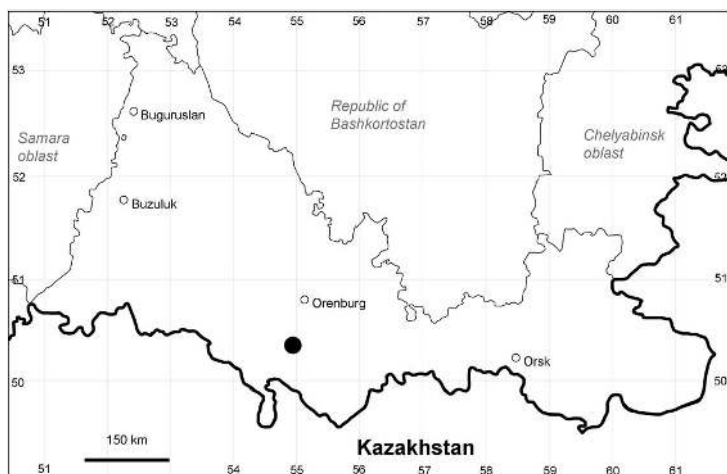


Figure 41. [doi](#)

Distribution map of *Kalidium caspicum*.

Previous reports: Mavrodiev and Sukhorukov (2000), Knjazev (2009).

The species occurs on saline lands. It is known from a single old record in the Region, made in the 1910s.

The species is distributed in Eastern Europe (south-eastern part: the only locality in Orenburg Region), West Asia (Turkey), the Caucasus and Central Asia.

***Kalidium foliatum* (Pall.) Moq.**

- IPNI [urn:lsid:ipni.org:names:165911-1](http://www.ipni.org/names/165911-1)

Nomenclature:

Kalidium foliatum (Pall.) Moq. in DC., Prodr. 13(2): 147 (1849) $\equiv$ *Salicornia foliata* Pall., Reise 1: 422 (1771).

Native status: Native.

Conservation status: Least Concern (LC).

Currently under legal protection in Orenburg Region because of its rarity and restricted distribution, category 3 (Belov 2019).

EOO 800 km², AOO 12 km². This species has a restricted occurrence at the northern limit of its distribution. Nevertheless, its populations are confined to saline soils which are not threatened by human activities. For this reason, its further legal protection is considered unnecessary.

Distribution: Orenburg Region: Svetlyi District (Fig. 42).

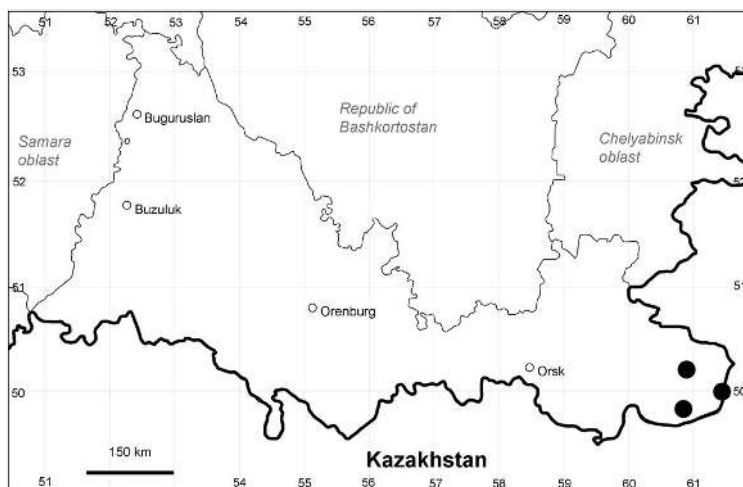


Figure 42. [doi](#)

Distribution map of *Kalidium foliatum*.

Previous reports: Knjazev (2009).

The species occurs on saline substrates. It is restricted to the easternmost part of the Region.

The species is distributed in southern Russia, the Caucasus, Central Asia, Iran.

***Salicornia perennans* Willd.**

- IPNI [urn:lsid:ipni.org:names:166576-1](http://www.ipni.org/names/166576-1)

Nomenclature:

***Salicornia perennans* Willd., Sp. Pl. 1: 24 (1797).**

= *Salicornia prostrata* Pall., Ill. Pl.: 8, tab. 3 (1803).

– *Salicornia europaea* auct.: Ryabinina (1998).

– *Salicornia herbacea* auct.: Iljin (1930).

Native status: Native

Conservation status: Least Concern (LC).

EOO 63,000 km², AOO 60 km². The species is common in the southern districts and may be found sporadically occurring elsewhere.

Distribution: Orenburg Region (southern districts): Adamovka, Belyaevka, Dombarovka, Gai, Kuvandyk, Kvarkeno, Novoorsk, Pervomaiskii, Sol'-Iletsk, Svetlyi, Yasnyi Districts, Orenburg City (Fig. 43).

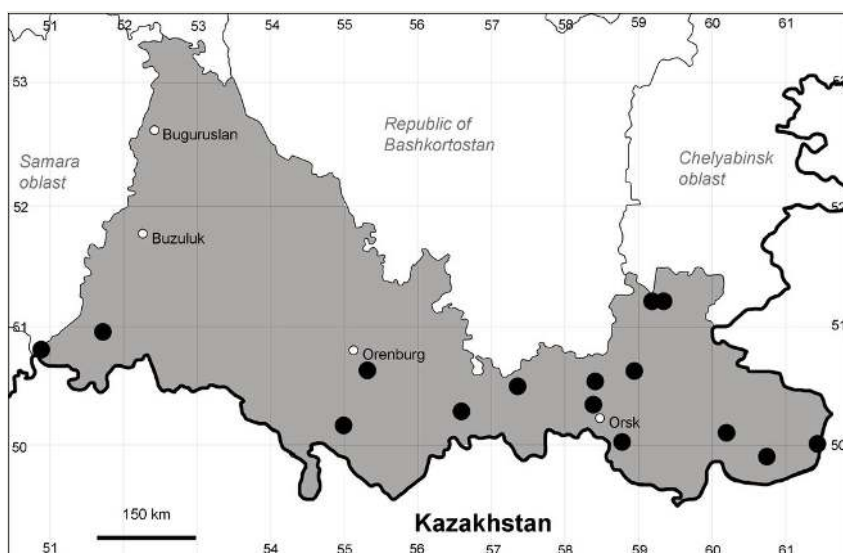


Figure 43. [doi](#)

Distribution map of *Salicornia perennans*, confirmed (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline sites. It is common in the Region.

The species is distributed in arid regions of Eurasia.

***Suaeda acuminata* (Ledeb.) Moq.**

- IPNI [urn:lsid:ipni.org:names:167396-1](http://www.ipni.org/names/167396-1)

Nomenclature:

Suaeda acuminata (Ledeb.) Moq., Ann. Sci. Nat. (Paris) 23: 306 (1831) ≡ *Schoberia acuminata* Ledeb., Icon. Pl. Fl. Ross. 1: 11 (1829).

= *Suaeda confusa* Iljin, Fl. Yugo-Vostoka Evr. Chasti SSSR 4: 196 (1930).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 10,700 km², AOO 24 km². The species is rather common in the southern districts, without a tendency to decline.

Distribution: Orenburg Region (southern districts): Belyaevka, Ilek, Novoorsk, Svetlyi Districts (Fig. 44). Northern limit of the species distribution.

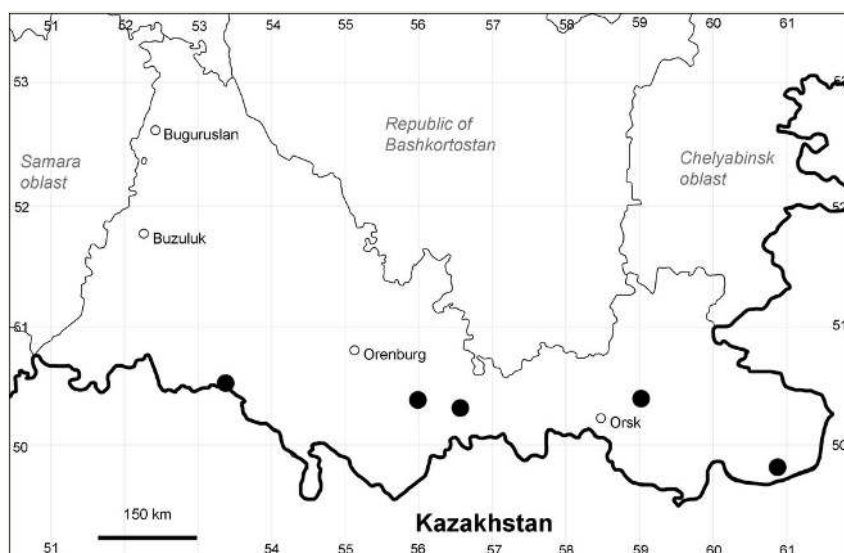


Figure 44. [doi](#)

Distribution map of *Suaeda acuminata*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates. It is frequent in the Region.

The species is distributed as native in the arid zone of Eurasia. It is known as a rare alien in the forest zone of Europe.

***Suaeda corniculata* (C.A.Mey.) Bunge**

- IPNI [urn:lsid:ipni.org:names:167442-1](http://www.ipni.org/names/167442-1)

Nomenclature:

Suaeda corniculata (C.A.Mey.) Bunge, Trudy S.-Peterburgsk. Bot. Sada 6(2): 429 (1879) $\equiv$ *Schoberia corniculata* C.A.Mey. in Ledeb., Fl. Alt. 1: 399 (1829).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 80,700 km², AOO 72 km². The species is common in the territory, without a tendency to decline.

Distribution: Orenburg Region (whole territory): Adamovka, Akbulak, Asekeev, Belyaevka, Gai, Kuvandyk, Kvarkeno, Novoorsk, Novosergievka, Orenburg, Sol'-Iletsk, Totskoe Districts, Orsk Town (Fig. 45).

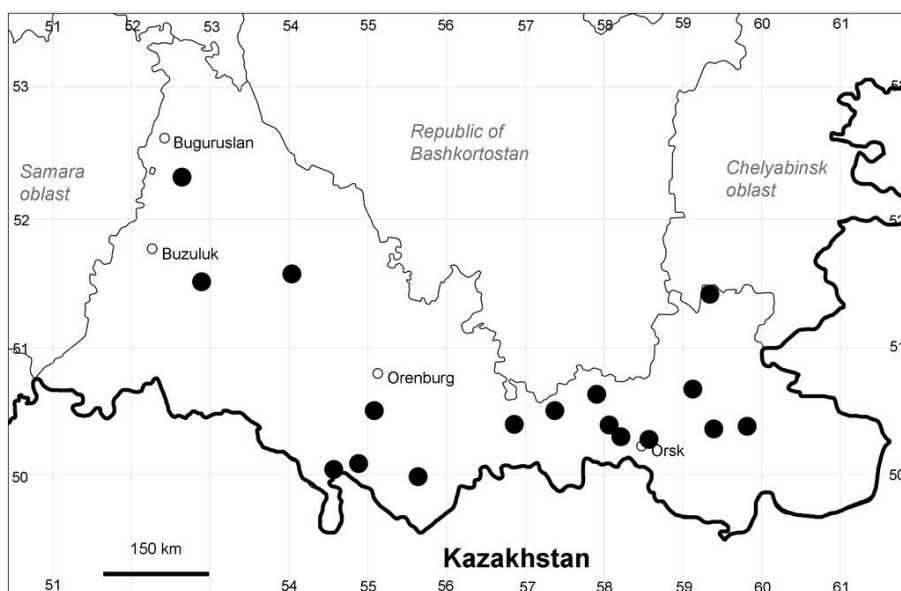


Figure 45. doi

Distribution map of *Suaeda corniculata*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates. It is frequent in the Region.

The species is distributed in Eastern Europe (Volga River), Siberia, Mongolia and northern China.

***Suaeda kulundensis* Lomon. & Freitag**

- IPNI [urn:lsid:ipni.org:names:77091710-1](http://www.ipni.org/names/77091710-1)

Nomenclature:

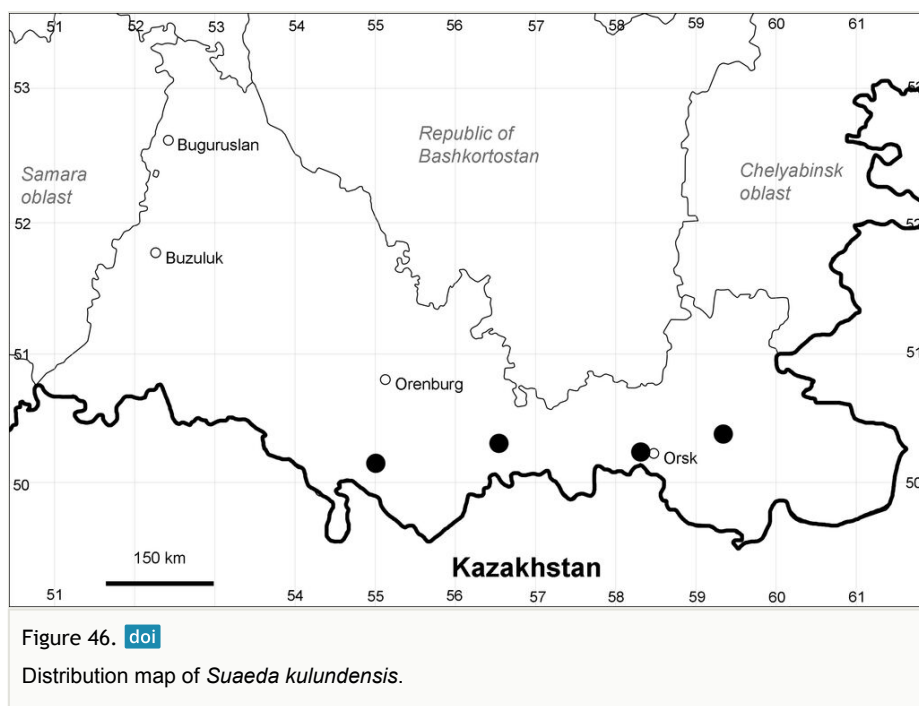
Suaeda kulundensis Lomon. & Freitag, Willdenowia 38(1): 99 (2008).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 3,600 km², AOO 16 km². Further records are expected and no significant decline was observed or projected.

Distribution: Orenburg Region (south-eastern districts): Belyaevka, Novoorsk, Sol'-Iletsk Districts, Orsk Town (Fig. 46).



Previous reports: Lomonosova et al. (2008).

The species occurs on saline substrates.

The species is distributed in Eastern Europe (Volga River) and Siberia.

***Suaeda linifolia* Pall.**

- IPNI [urn:lsid:ipni.org:names:167492-1](http://www.ipni.org/names/167492-1)

Nomenclature:

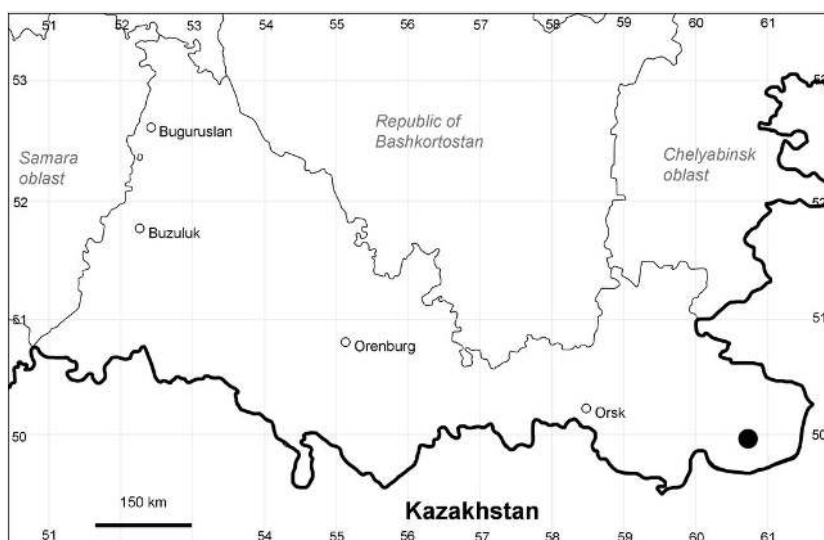
***Suaeda linifolia* Pall., III. Pl.: 47 (1803).**

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections.

Distribution: Orenburg Region: Svetlyi District (Fig. 47).

Figure 47. [doi](#)Distribution map of *Suaeda linifolia*.

Previous reports: Ryabinina (1998).

The species occurs on saline substrates. It is known from a single locality.

The species is distributed in Eastern Europe (south-eastern part), south-western Siberia, West and Central Asia, Iran, western China. It is known as alien in the western part of North America.

***Suaeda physophora* Pall.**

- IPNI [urn:lsid:ipni.org:names:167542-1](http://www.ipni.org/names/167542-1)

Nomenclature:

Suaeda physophora Pall., Ill. Pl.: 51 (1803).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 28,800 km², AOO 32 km². The species was found in several localities, without a tendency to decline.

Distribution: Orenburg Region (southern and eastern districts): Dombarovka, Gai, Kvarkeno, Sol'-Iletsk, Svetlyi Districts, Orsk Town (Fig. 48).

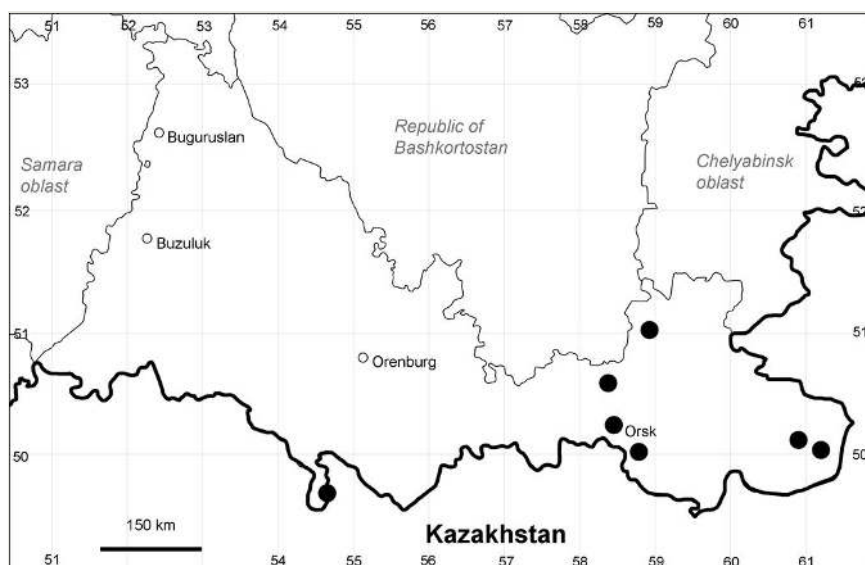


Figure 48. [doi](#)

Distribution map of *Suaeda physophora*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates. It is rare in the southern and eastern parts of the Region.

The species is distributed in Eastern Europe (south-east European Russia), the Caucasus (eastern part), Iran (northern part), Kazakhstan, western China.

***Suaeda prostrata* Pall.**

- IPNI [urn:lsid:ipni.org:names:167547-1](http://www.ipni.org/names/167547-1)

Nomenclature:

Suaeda prostrata Pall., Ill. Pl.: 55 (1803).

– *Suaeda maritima* auct.: Iljin (1930).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 60,000 km², AOO 40 km². The species is common in the territory and its wider occurrence is expected (as reported by Knjazev (2009)). No evidence of declining.

Distribution: Orenburg Region (whole territory): Asekeev, Belyaevka, Dombarovka, Gai, Kuvandyk, Novoorsk, Pervomaiskii, Sol'-Iletsk Districts (Fig. 49).

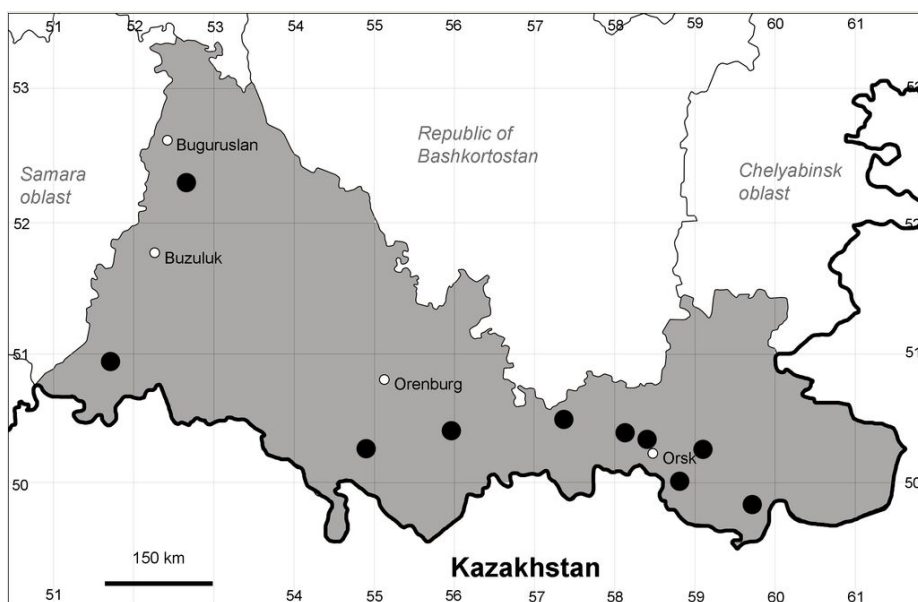


Figure 49. [doi](#)

Distribution map of *Suaeda prostrata*, confirmed (points) and projected (shade) occurrence.

Previous reports: Ryabinina (1998), Knjazez (2009).

The species occurs on saline substrates. It is common in the Region.

The species is distributed in the steppe and forest-steppe zones of Eurasia, from Central Europe to western China.

Suaeda salsa (L.) Pall.

- IPNI [urn:lsid:ipni.org:names:167562-1](http://www.ipni.org/names/167562-1)

Nomenclature:

Suaeda salsa (L.) Pall., III. Pl.: 46 (1803) $\equiv$ *Chenopodium salsum* L., Sp. Pl. 1: 221 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 14,100 km², AOO 32 km². The species is common in the south and no decline was observed or projected.

Distribution: Orenburg Region (southern districts): Akbulak, Belyaevka, Novoorsk, Sol'-Iletsk, Svetlyi, Yasnyi Districts (Fig. 50).

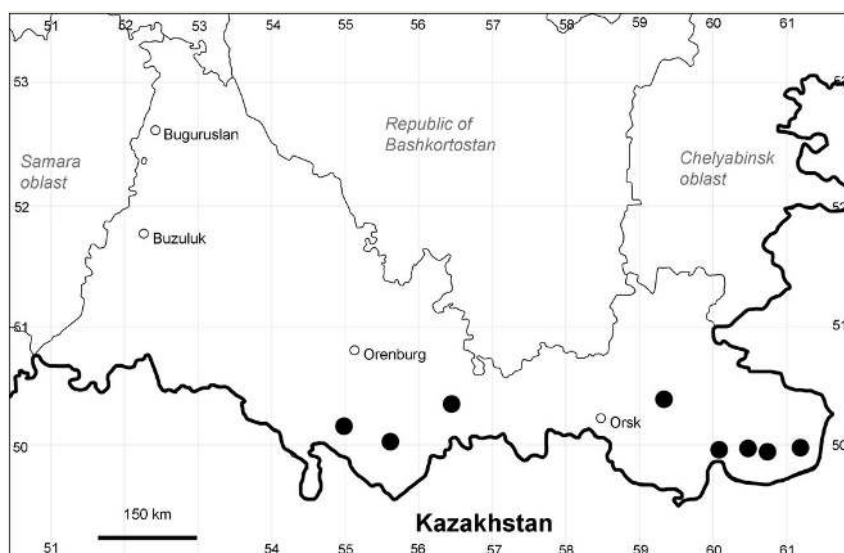


Figure 50. [doi](#)

Distribution map of *Suaeda salsa*.

Previous reports: Iljin (1930), Knjazev (2009).

The species occurs on saline substrates. It is common in the Region.

The species is distributed in Eastern Europe (south-eastern part), the Caucasus, Kazakhstan, southern Siberia.

***Bassia hyssopifolia* (Pall.) Kuntze**

- IPNI [urn:lsid:ipni.org:names:29802-2](https://www.ipni.org/urn:lsid:ipni.org:names:29802-2)

Nomenclature:

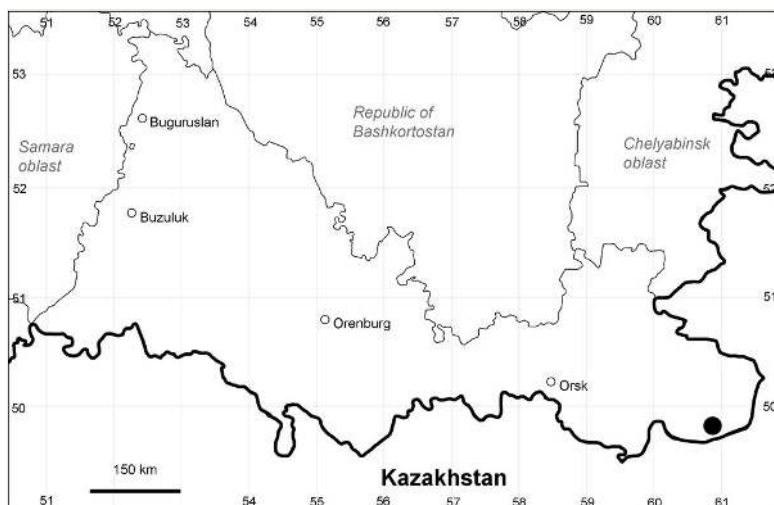
Bassia hyssopifolia (Pall.) Kuntze, Rev. Gen. Pl. 2: 547 (1891) ≡ *Salsola hyssopifolia* Pall., Reise 1: 491 (1771).

Native status: Native.

Conservation status: Least Concern (LC).

The species is known from a single locality, in which it was collected twice during a long period (1955, 2016). The population seems to be healthy and out of immediate danger; no further details were reported by Golovanov et al. (2018) who visited the place.

Distribution: Orenburg Region: Svetlyi District (Fig. 51).

Figure 51. [doi](#)Distribution map of *Bassia hyssopifolia*.

Previous reports: Ryabinina (1998), Golovanov et al. (2018).

The species occurs on saline substrates. It is very rare in the eastern part of the Region.

The species is distributed in Eastern Europe (south-eastern part), West Asia (southwards to Iraq and Saudi Arabia), Central Asia. It is known as a rare alien in the forest zone of Europe, in Australia, North and South America.

***Bassia laniflora* (S.G.Gmel.) A.J.Scott**

- IPNI [urn:lsid:ipni.org:names:164386-1](https://www.ipni.org/names/164386-1)

Nomenclature:

Bassia laniflora (S.G.Gmel.) A.J.Scott, Fedd. Repert. 89(2–3): 108 (1978) ≡ *Salsola laniflora* S.G.Gmel., Reise 1: 160 (1774) ≡ *Kochia laniflora* (S.G.Gmel.) Borb., Balaton Fl.: 340 (1900).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 24,500 km², AOO 32 km². The species was found in several localities covering the western part of the territory and no decline was observed or projected.

Distribution: Orenburg Region (western districts): Buzuluk, Pervomaiskii, Sakmara, Sol'-Iletsk, Tashla Districts (Fig. 52).

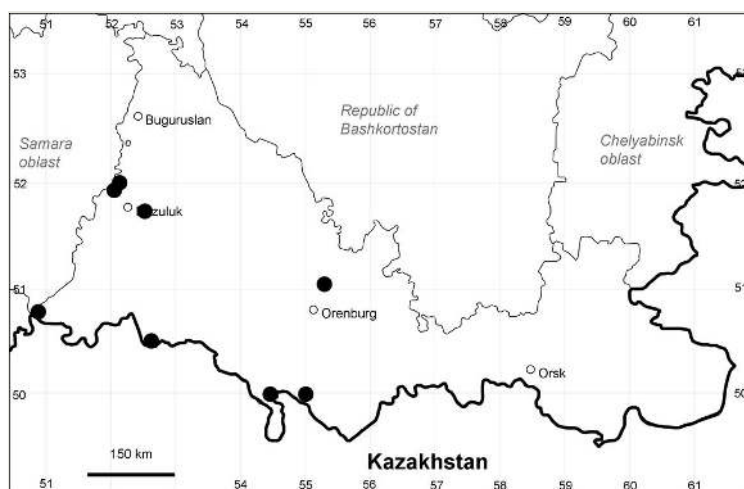


Figure 52. [doi](#)

Distribution map of *Bassia laniflora*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on sands. It is sporadically found in the Region.

The species is distributed in Central and Southern Europe, the Caucasus, Kazakhstan, southern Siberia.

***Bassia prostrata* (L.) Beck**

- IPNI [urn:lsid:ipni.org:names:60447623-2](http://www.ipni.org/names/60447623-2)

Nomenclature:

Bassia prostrata (L.) Beck in Reichenbach, Icon. Fl. Germ. Helv. 24: 155 (1909) ≡ *Kochia prostrata* (L.) Schrad., Neues J. Bot. 3(3–4): 85 (1809) ≡ *Salsola prostrata* L., Sp. Pl. 1: 222 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 120,800 km², AOO 196 km². The species occurs abundantly and is very common in the territory.

Distribution: Orenburg Region (whole territory): Abdulino, Adamovka, Akbulak, Asekeevo, Belyaevka, Buguruslan, Buzuluk, Dombarovka, Gai, Grachevka, Ile, Krasnaya Gvargia, Kvarkeno, Kuvandyk, Novoorsk, Novosergievka, Orenburg, Perevolotskii, Pervomaiskii, Ponomarevka, Sakmara, Sol'-Iletsk, Svetlyi, Tashla, Totskoe, Yasnyi Districts, Orsk Town (Fig. 53).

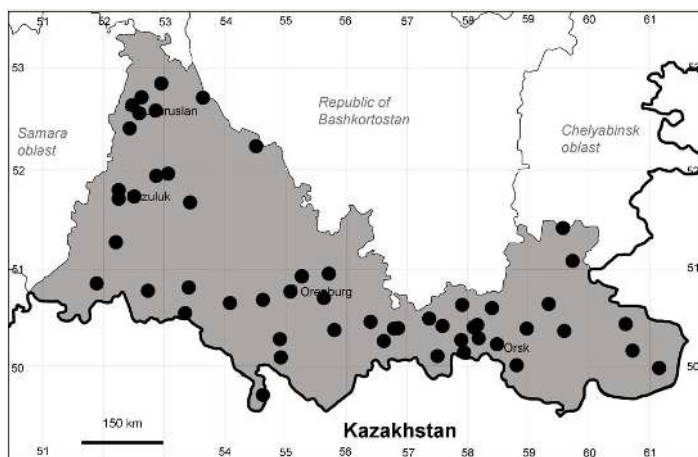


Figure 53. [doi](#)

Distribution map of *Bassia prostrata*, confirmed (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs in steppes, on limestone. It is common in the Region.

The species is distributed as native in Eurasia (from steppes to deserts) and locally in North Africa (Morocco). It is known as alien in North America.

***Bassia scoparia* (L.) Beck**

- IPNI urn:lsid:ipni.org:names:77325913-1

Nomenclature:

Bassia scoparia (L.) Beck in Reichenbach, Icon. Fl. Germ. Helv. 24: 155 (1909) ≡ *Kochia scoparia* (L.) Schrad., Neues J. Bot. 3((3-4): 85 (1809) ≡ *Chenopodium scoparia* L., Sp. Pl. 1: 221 (1753).

= *Suaeda sieversiana* Pall., Ill. Pl.: 45 (1803) ≡ *Kochia sieversiana* (Pall.) C.A.Mey. in Ledeb., Fl. Altaic. 1: 415 (1829).

= *Kochia scoparia* var. *densiflora* Moq. in DC., Prodr. 13(2): 131 (1849) ≡ *Kochia densiflora* (Moq.) Aellen, Mitt. Basler Bot. Ges. 2(1): 13 (1954) ≡ *Kochia scoparia* subsp. *densiflora* (Moq.) Aellen in Hegi, Ill. Fl. Mitteleur., ed. 2, 3/2: 710 (1961).

Native status: Established alien.

Conservation status: Not applicable.

Distribution: Orenburg Region: Belyaevka, Buzuluk, Gai, Ilek, Kuvandyk, Novoorsk, Novosergievka, Perevolotsky, Ponomaryovka, Sol'-Iletsk, Sorochinsk, Totskoe Districts, Orenburg City (Fig. 54).

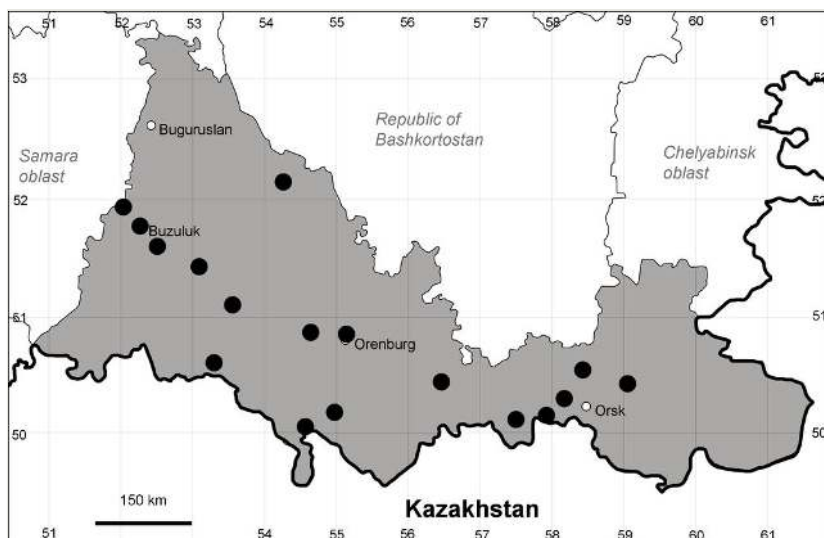


Figure 54. [doi](#)

Distribution map of *Bassia scoparia*, confirmed (points) and projected (shade) occurrence.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs along railroad beds, in populated places and their closest proximity.

The species is distributed as native in Central Asia (western China, Mongolia, southern Siberia). It is widely known as alien and naturalised in the temperate zone around the World. It spreads along roads and has arrived to the territory due to its formerly common cultivation as a technical plant (used for brooms in villages).

***Camphorosma lessingii* Litv.**

- IPNI url.isid.ipni.org/names:164611-1

Nomenclature:

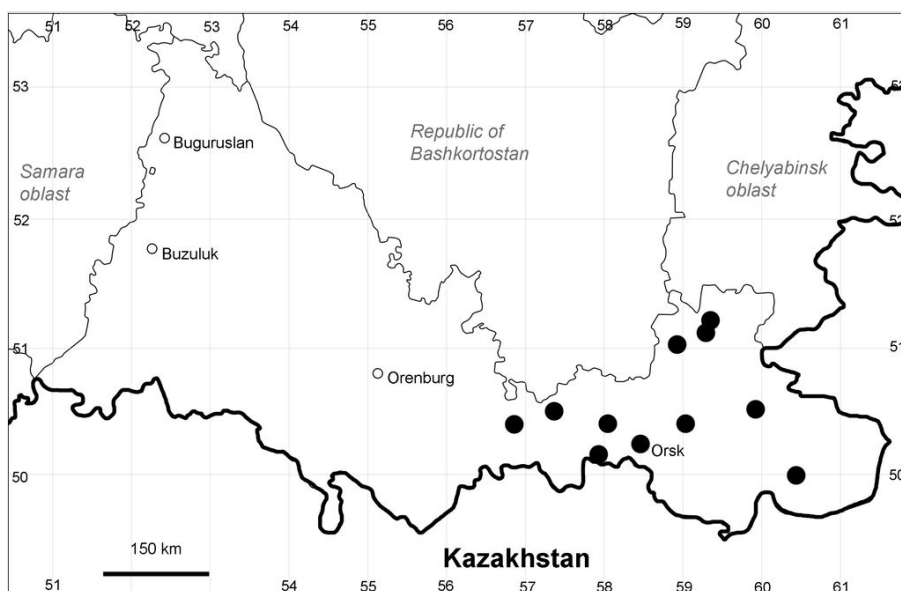
Camphorosma lessingii Litv., Trudy Bot. Muz. Imp. Acad. Nauk 2: 96 (1905).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 17,200 km², AOO 44 km². The species is common in the eastern part of the territory and no decline was observed or projected.

Distribution: Orenburg Region (eastern districts): Adamovka, Belyaevka, Gai, Kuvandyk, Kvarkeno, Novoorsk, Yasnyi Districts, Orsk Town (Fig. 55). Northern limit of the species distribution.

Figure 55. [doi](#)Distribution map of *Camphorosma lessingii*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates. It is frequent in the Region.

The species is distributed as native in Eastern Europe (south-eastern part) and Central Asia.

Camphorosma monspeliaca L.

- IPNI [urn:lsid:ipni.org:names:164614-1](http://www.ipni.org/names/164614-1)

Nomenclature:

Camphorosma monspeliaca L., Sp. Pl. 1: 122 (1753).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 47,500 km², AOO 64 km². The species is common in the southern parts of the territory and shows no sign of decline.

Distribution: Orenburg Region (southern districts): Adamovka, Akbulak, Belyaevka, Dombarovskii, Gai, Ile, Kuvandyk, Orenburg, Sol'-Ilets, Svetlyi, Tashla Districts (Fig. 56).

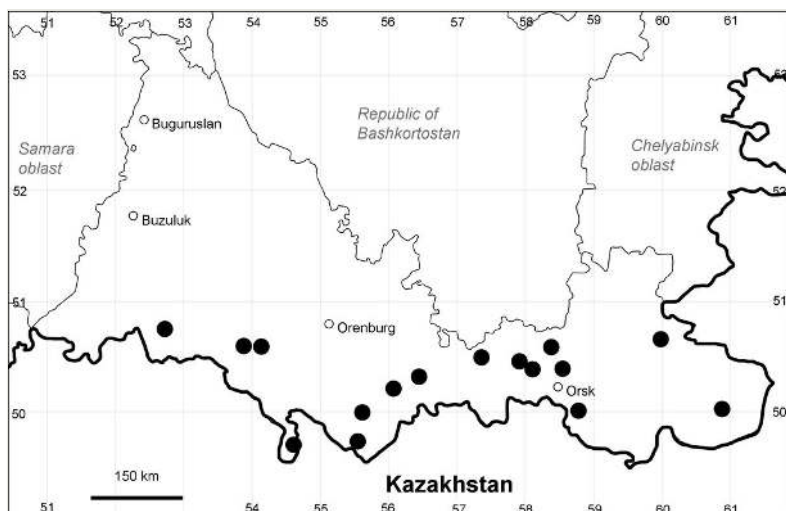


Figure 56. [doi](#)

Distribution map of *Camphorosma monspeliaca*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on saline lands. It is frequent in the Region.

The species is distributed in South and Eastern (southern part) Europe and Central Asia.

Camphorosma songorica Bunge

- IPNI [urn:lsid:ipni.org:names:164628-1](http://www.ipni.org/names/164628-1)

Nomenclature:

Camphorosma songorica Bunge, Trudy Imp. S.-Peterburgsk. Bot. Sada 6(2): 415 (1879).

– *Camphorosma annua* auct.: Iljin (1930).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 91,000 km², AOO 80 km². The species was found in many localities in all parts of the territory. No decline was observed or projected.

Distribution: Orenburg Region (whole territory): Adamovka, Akbulak, Buzuluk, Dombarovka, Krasnaya Gvardia, Kuvandyk, Kvarkeno, Novoorsk, Orenburg, Pervomaiskii, Sharlyk, Sol'-Ilets, Svetlyi, Tashla, Totskoe Districts (Fig. 57).

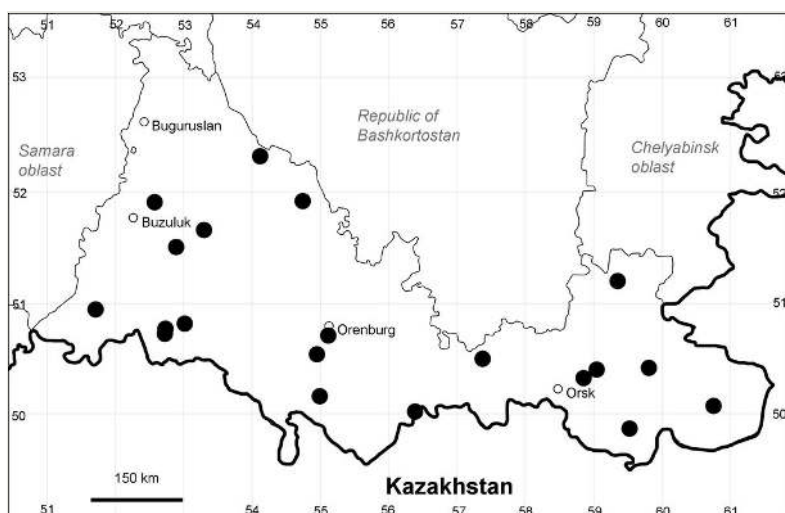


Figure 57. [doi](#)

Distribution map of *Camphorosma songorica*.

Previous reports: Iljin (1930), as *C. annua*; Ryabinina (1998), Knjazev (2009).

The species occurs on saline lands. It is common in the Region.

The species is distributed in Eastern Europe, Kazakhstan and western Siberia.

***Sedobassia sedoides* (Pall.) Freitag & G.Kadereit**

- IPNI [urn:lsid:ipni.org:names:77110741-1](http://www.ipni.org/names/77110741-1)

Nomenclature:

Sedobassia sedoides (Pall.) Freitag & G.Kadereit, Taxon 60(1): 72 (2011) $\equiv$ *Salsola sedoides* Pall., Reise 1: 492 (1771), nom. cons. $\equiv$ *Bassia sedoides* (Pall.) Asch. in Schweinfurth, Beitr. Fl. Aethiop. 1: 187 (1867).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 120,000 km², AOO 170 km². The species is one of the most common plants in saline sites, showing no decline.

Distribution: Orenburg Region (whole territory): Adamovka, Aleksandrovka, Asekeevka, Belyaevka, Buguruslan, Buzuluk, Gai, Grachevka, Ile, Krasnaya Gvardia, Kurmanaevka, Kuvandyk, Kvarkeno, Novoorsk, Novosergievka, Orenburg, Saraktash, Sol'-Iletsk, Svetlyi, Totskoe, Yasnyi Districts, Orsk Town (Fig. 58).

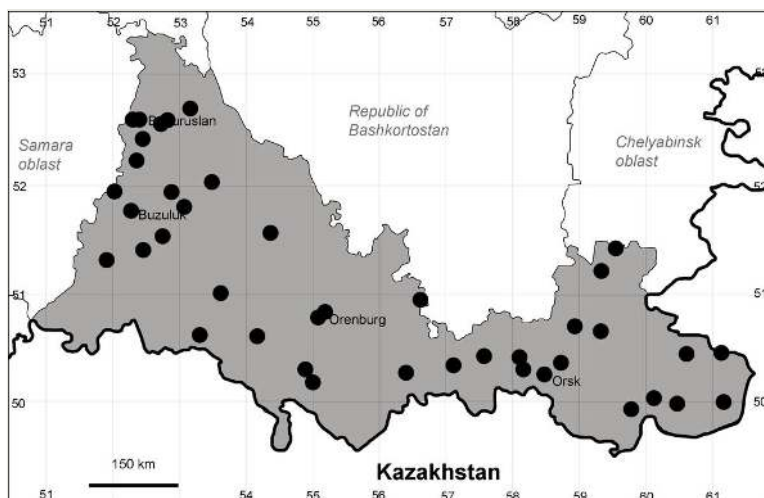


Figure 58. [doi](#)

Distribution map of *Sedobassia sedoides*, confirmed (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs on saline substrates. It is common in the Region.

The species is distributed as native in Central and Eastern (southern part) Europe, Kazakhstan, western China (Sennikov and Freitag 2014). It is known as a rare alien in the forest zone of Europe.

Spirobassia hirsuta (L.) Freitag & G.Kadereit

- IPNI [urn:lsid:ipni.org:names:77110313-1](http://www.ipni.org/names/77110313-1)

Nomenclature:

Spirobassia hirsuta (L.) Freitag & G.Kadereit, Taxon 60(1): 71 (2011) $\equiv$ *Chenopodium hirsutum* L., Sp. Pl. 1: 221 (1753) $\equiv$ *Bassia hirsuta* (L.) Asch. in Schweinfurth, Beitr. Fl. Aethiop. 1: 187 (1867).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 27,800 km², AOO 12 km². The species has a restricted distribution in the south-eastern part of Orenburg Region. However, its populations are confined to saline lands, which are not threatened by anthropogenic disturbance and no actual protection is consequently required.

Distribution: Orenburg Region: Svetlyi District (Fig. 59).

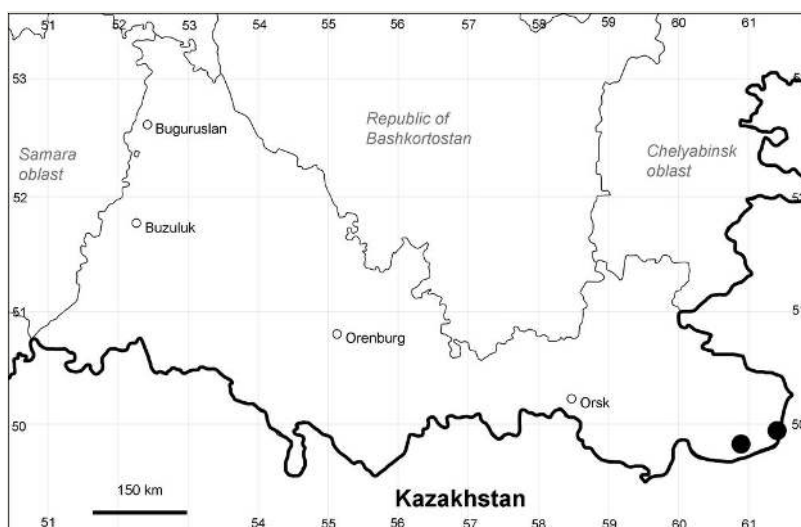


Figure 59. [doi](#)
Distribution map of *Spirobassia hirsuta*.

Previous reports: Knjazev (2009).

The species occurs on saline lands. It is very rare in the eastern part of the Region.

The species is distributed as native in Western and Southern Europe (sea shores), south-west Siberia and Kazakhstan. It is known as alien in North America (eastern part).

***Caroxylon laricinum* (Pall.) Tzvelev**

- IPNI [urn:lsid:ipni.org:names:972505-1](http://www.ipni.org/names/972505-1)

Nomenclature:

Caroxylon laricinum (Pall.) Tzvelev, Ukr. Bot. Zhurn. 50(1): 81 (1993) $\equiv$ *Salsola laricina* Pall., Ill: 21 (1803).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 114,400 km², AOO 72 km². The species is widely distributed in the southern parts of the territory, showing no decline.

Distribution: Orenburg Region: Akbulak, Belyaevka, Dombarovka, Gai, Orenburg, Pervomaiskii, Severnoe, Sol'-Iletsk, Svetlyi, Tashla, Tyulgan Districts, Orsk Town (Fig. 60).

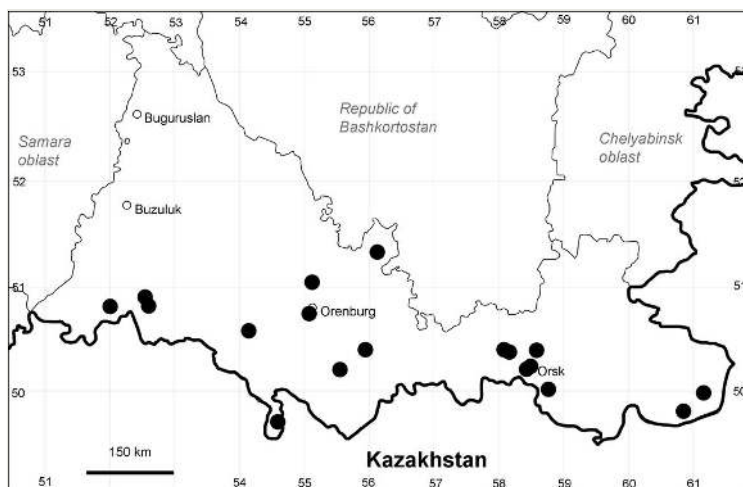


Figure 60. [doi](#)

Distribution map of *Caroxylon laricinum*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs in steppes, on sands and limestones. It is frequent in the Region.

The species is distributed in Russia, Ukraine (southern part), Kazakhstan, West Asia (Turkey).

***Nanophyton erinaceum* (Pall.) Bunge**

- IPNI [urn:lsid:ipni.org:names:166172-1](http://www.ipni.org/names/166172-1)

Nomenclature:

Nanophyton erinaceum (Pall.) Bunge, Mém. Ac. Sci. Petersb., ser. 7, 4(11): 51 (1862)
 ≡ *Polycnemum erinaceum* Pall., III. Pl.: 58 (1803).

The species was originally described from Orenburg Region.

Native status: Native.

Conservation status: Vulnerable (VU): A3(d), C1. Currently under protection, category 3 (Belov 2019).

EOO 28,600 km², AOO 76 km². The species was protected because of its rarity on the northern margin of the species distribution and because of the vulnerability of its habitats (limestone and other calcareous deposits are actively developed) (Ryabinina 1995). Its currently known distribution is much more extensive than previously believed (Belov 2019), but the limited size of its populations and the vulnerability of its habitats to anthropogenic pressure suggest that its protection status is appropriate.

Distribution: Orenburg Region (southern districts): Akbulak, Belyaevka, Dombarovka, Gai, Novoorsk, Orenburg, Sol'-Iletsk, Yasnyi Districts, Orsk Town (Fig. 61).

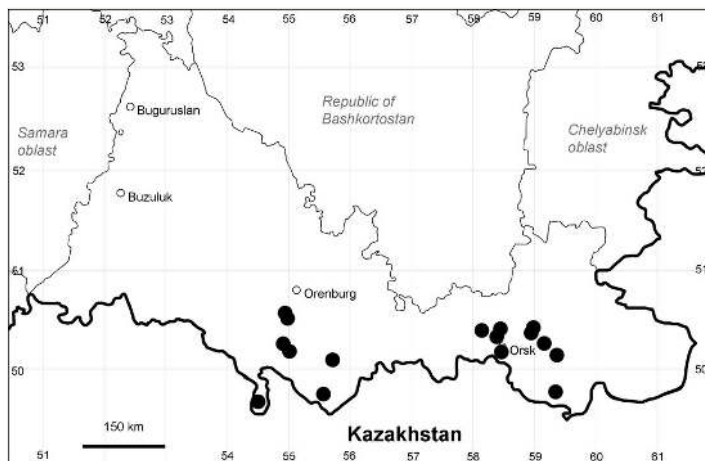


Figure 61. [doi](#)

Distribution map of *Nanophyton erinaceum*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs in petrophytic steppes, on chalk and limestone. It has a restricted distribution in the Region.

The species is distributed in Eastern Europe (south-eastern part), Kazakhstan, western China. In Russia, the species occurs only in Orenburg Region.

***Ofaiston monandrum* (Pall.) Moq.**

- IPNI [urn:lsid:ipni.org:names:166316-1](http://www.ipni.org/names/166316-1)

Nomenclature:

Ofaiston monandrum (Pall.) Moq. in DC., Prodr. 13(2): 203 (1849) $\equiv$ *Salsola monandra* Pall., Reise 3: 607 (1776).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 33,600 km², AOO 44 km². The species is not rare in the eastern part of the territory.

Distribution: Orenburg Region (central and eastern districts): Adamovka, Akbulak, Belyaevka, Gai, Kvarkeno, Novoorsk, Sol'-Iletsk, Svetlyi Districts (Fig. 62). Northern limit of the species distribution.

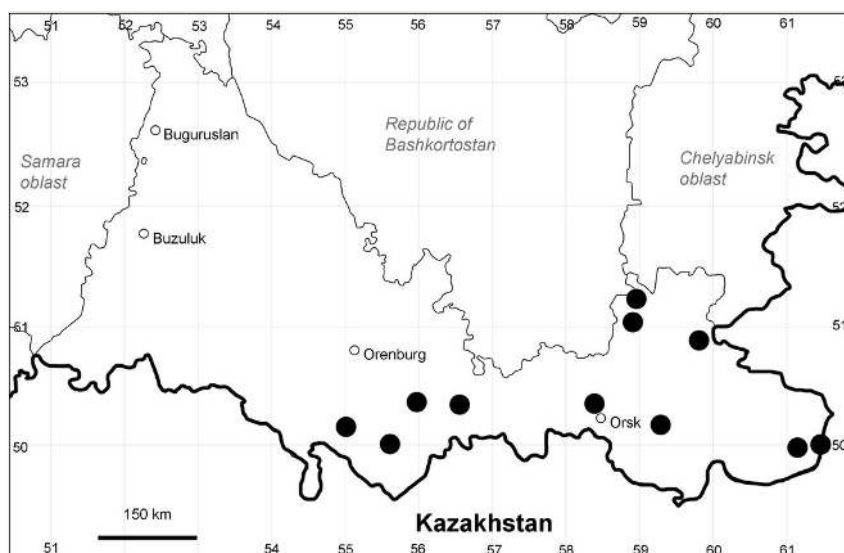


Figure 62. [doi](#)

Distribution map of *Ofaiston monandrum*.

Previous reports: Ryabinina (1998), Knjazez (2009).

The species occurs on saline lands. It is frequent in the Region.

The species is distributed in Eastern Europe (southern part), West Siberia, Kazakhstan, Uzbekistan (near Aral Sea).

***Petrosimonia brachyphylla* (Bunge) Iljin**

- IPNI [urn:lsid:ipni.org:names:166360-1](http://www.ipni.org/names/166360-1)

Nomenclature:

Petrosimonia brachyphylla (Bunge) Iljin, Materialy Komissii Exped. Issledovaniy Akad. Nauk 26(2): 282 (1930) $\equiv$ *Petrosimonia crassifolia* var. *brachyphylla* Bunge, Mém. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 7, 4(11): 56 (1862).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 6,400 km², AOO 16 km². The species is rare in the region, but not immediately threatened.

Distribution: Orenburg Region: Belyaevka, Gai, Saraktash, Svetlyi Districts (Fig. 63).

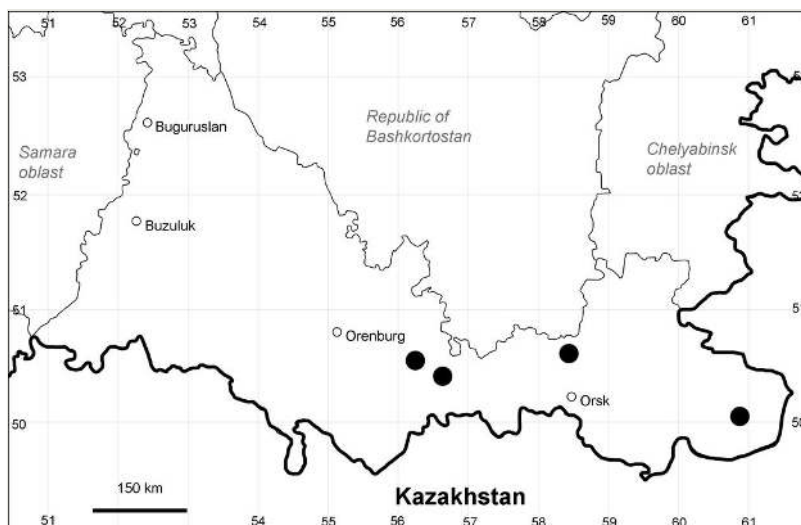


Figure 63. [doi](#)
Distribution map of *Petrosimonia brachyphylla*.

Previous reports: Mavrodiev and Sukhorukov (2000), Knjazez (2009).

The species occurs on saline lands. It is rare in the Region.

The species is distributed in Eastern Europe (south-eastern part), Kazakhstan, western China.

***Petrosimonia litwinowii* Korsh.**

- IPNI [urn:lsid:ipni.org:names:166369-1](http://www.ipni.org/names/166369-1)

Nomenclature:

Petrosimonia litwinowii Korsh., Tent. Fl. Ross. Orient.: 358 (1898).

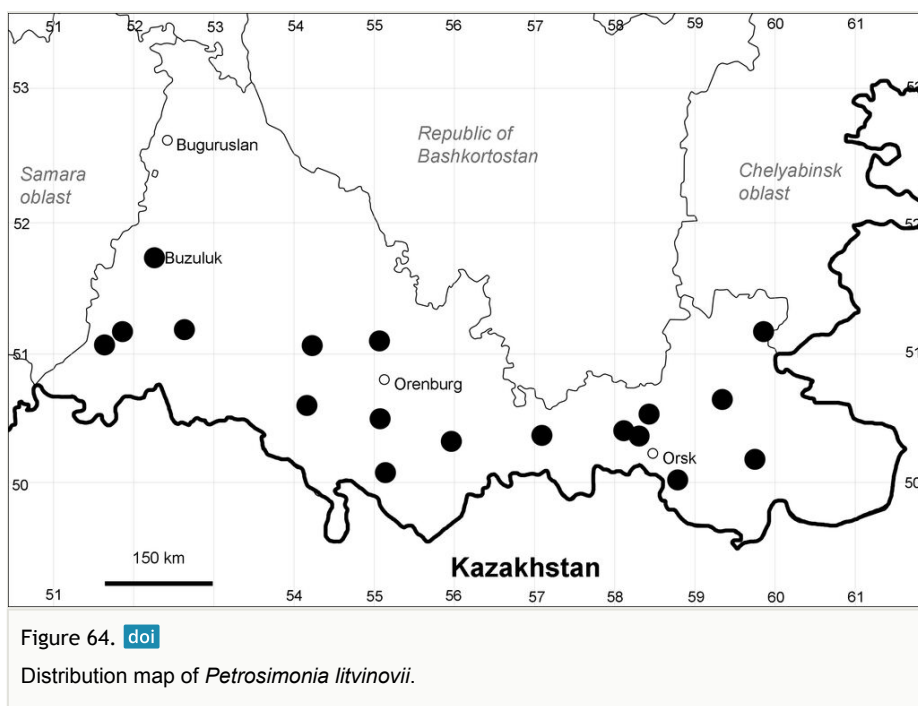
The species was originally described from Orenburg Region.

Native status: Native.

Conservation status: Least Concern (LC).

EOO 80,600 km², AOO 80 km². The species is common in the territory and shows no decline.

Distribution: Orenburg Region: Adamovka, Aleksandrovka, Belyaevka, Dombarovka, Gai, Kvarkeno, Kurmanaevka, Kuvandyk, Novoorsk, Orenburg, Pervomaiskii, Sol'-Iletsk, Svetlyi, Totskoe, Yasnyi Districts (Fig. 64).



Previous reports: Ryabinina (1998), Knjazez (2009).

The species occurs on saline lands. It is common in the Region.

The species is distributed in Russia and Kazakhstan.

***Petrosimonia monandra* (Pall.) Bunge**

- IPNI [urn:lsid:ipni.org:names:166370-1](http://www.ipni.org/names/166370-1)

Nomenclature:

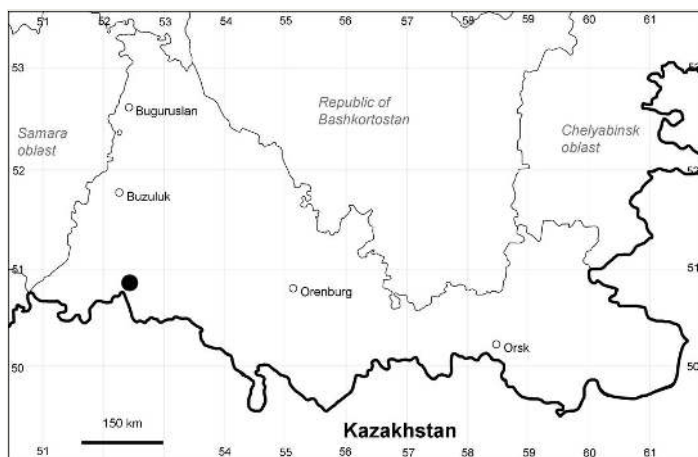
Petrosimonia monandra (Pall.) Bunge, Anabas. Rev.: 53 (1862) $\equiv$ *Polycnemum monandrum* Pall., Reise 1: 483 (1771).

Native status: Native.

Conservation status: Data Deficient (DD).

A threatened category has not been assigned due to the absence of recent collections.

Distribution: Orenburg Region: Tashla District (Fig. 65).

Figure 65. [doi](#)Distribution map of *Petrosimonia monandra*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs in steppes and on saline substrates. It is very rare in the Region, known from a single collection dated the 1920s.

The species is distributed in Russia and Kazakhstan.

***Petrosimonia triandra* (Pall.) Simonk.**

- IPNI [urn:lsid:ipni.org:names:166376-1](http://www.ipni.org/names/166376-1)

Nomenclature:

Petrosimonia triandra (Pall.) Simonk., Enum. Pl. Transsilv.: 466 (1866) $\equiv$ *Polycnemum triandrum* Pall., Reise 1: 483 (1771).

= *Polycnemum volvox* Pall., Ill. Pl.: 60 (1803) $\equiv$ *Petrosimonia volvox* (Pall.) Bunge, Anab. Rev.: 54 (1862).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 34,700 km², AOO 44 km². The species is common in the southern part of the territory and shows no decline.

The species is currently listed as legally protected in Orenburg Region (category 2) because of its presumed rarity and restricted distribution (four localities were known at the time) (Belov 2019). According to our data, the species is widely distributed in the southern part of Orenburg Region and its wider occurrence is expected. No legal protection is needed.

Distribution: Orenburg Region: Adamovka, Belyaevka, Gai, Kurmanaevka, Kuvandyk, Pervomaiskii, Sol'-Iletsk, Svetlyi Districts (Fig. 66).

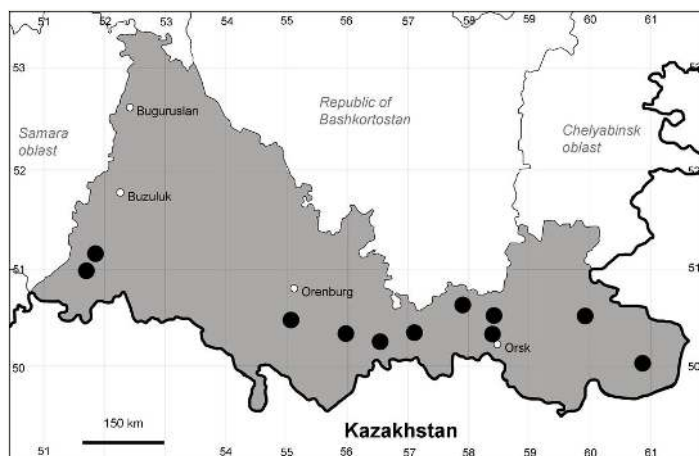


Figure 66. [doi](#)

Distribution map of *Petrosimonia triandra*, confirmed (points) and projected (shade) occurrence.

Previous reports: Knjazev (2009).

The species occurs in steppes and on saline lands. It is common in the southern part of the Region.

The species is distributed in Central, South and Eastern Europe, the Caucasus, western Iran, Central Asia (Kazakhstan).

***Pyankovia brachiata* (Pall.) Akhani & Roalson**

- IPNI [urn:lsid:ipni.org:names:77089207-1](http://www.ipni.org/names/77089207-1)

Nomenclature:

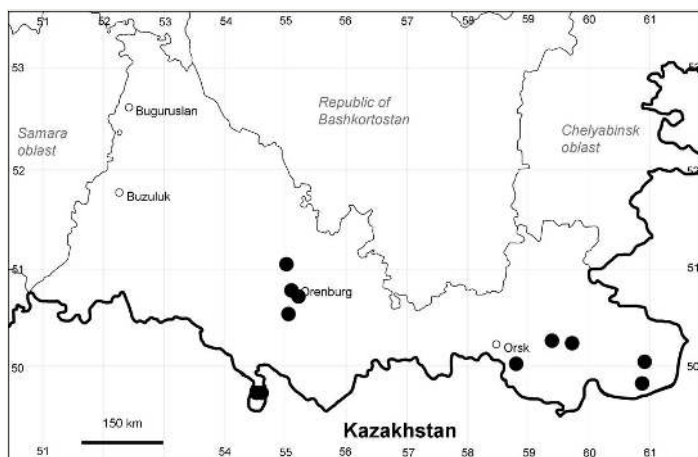
Pyankovia brachiata (Pall.) Akhani & Roalson, Int. J. Pl. Sci. 168(6): 949 (2007) $\equiv$ *Salsola brachiata* Pall., Ill. Pl. 30 (1803) $\equiv$ *Climacoptera brachiata* (Pall.) Botsch., Sborn. Rabot Akad. Sukachevu: 114 (1956).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 37,400 km², AOO 36 km². The species is common in the central and eastern parts of the territory and shows no decline.

Distribution: Orenburg Region: Novoorsk, Orenburg, Sakmara, Sol'-Iletsk, Svetlyi, Yasnyi Districts (Fig. 67).

Figure 67. [doi](#)Distribution map of *Pyankovia brachiata*.

Previous reports: Knjazev (2009).

The species occurs in steppes, on saline lands and also in human-made habitats. It is common in the southern part of the Region.

The species is distributed in Eastern Europe (south-eastern part) and Central Asia.

***Anabasis cretacea* Pall.**

- IPNI [urn:lsid:ipni.org:names:163406-1](http://www.ipni.org/names/163406-1)

Nomenclature:

***Anabasis cretacea* Pall.**, Reise 1: 493 (1771).

Native status: Native.

Conservation status: Vulnerable (VU): A3(d), C1. Currently under protection, category 3 (Belov 2019).

EOO 44,800 km², AOO 16 km². Before the recent period of the botanical exploration, the species was known in three districts only and considered to have a limited distribution in Orenburg Region (Ryabinina 1998). Since then, further localities were discovered (Golovanov et al. 2018) and the distribution mapped here is even greater.

The species occurs exclusively on open calcareous substrates (chalk, limestone, marl, gypsaceous denudations) in small populations (Ryabinina 1998, Belov 2019). Although no apparent large-scale decline of its populations was observed, its habitats are fragile and require legal protection because of their being susceptible to anthropogenic pressure (by visiting and pasturing) and destruction by mining, which assumes

projected decline of its populations in the absence of protection. Similarly, the species is protected in the neighbouring territories: Bashkortostan (Martynenko 2021) and Chelyabinsk Region (Lagunov 2017).

Distribution: Orenburg Region: Akbulak, Belyaevka, Dombarovka, Gai, Novoorsk, Sol'-Iletsk, Yasnyi Districts, Orsk Town (Fig. 68).

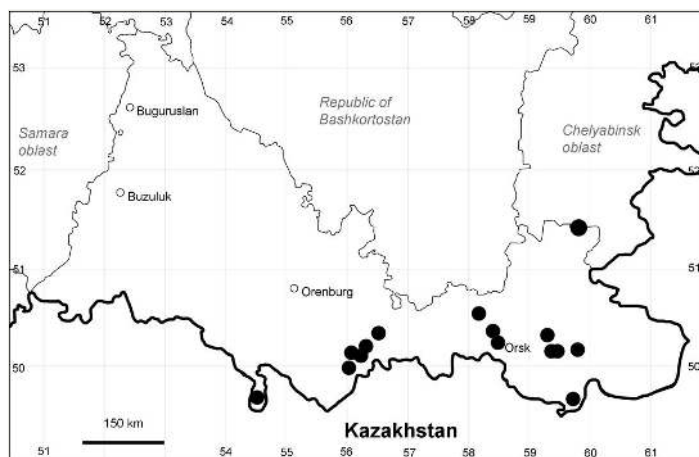


Figure 68. doi

Distribution map of *Anabasis cretacea*.

Previous reports: Ryabinina (1998), Knjazev (2009).

The species occurs in petrophytic steppes, on limestone. It has a limited distribution in the Region.

The species is distributed in Eastern Europe (south-eastern part), Siberia (south-western part), Kazakhstan, western China (Xinjiang).

***Anabasis salsa* (Ledeb.) Benth. ex Volkens**

- IPNI [urn:lsid:ipni.org:names:163460-1](https://www.ipni.org/names/163460-1)

Nomenclature:

Anabasis salsa (Ledeb.) Benth. ex Volkens in Engler & Prantl, Nat. Pflanzenfam. 3, 1a: 87 (1893) $\equiv$ *Brachylepis salsa* Ledeb., Icon. Pl. Fl. Ross. 1: 12 (1829).

Native status: Native.

Conservation status: Vulnerable (VU): C1. Currently under protection, category 3 (Belov 2019).

EOO 43,300 km², AOO 68 km². The species has been placed under legal protection because of its rarity on the northern margin of the species distribution, because its

population size was estimated at less than 1000 mature individuals and because its populations were threatened by grazing. Its currently known distribution is much more extensive than previously believed (Belov 2019) and its habitats (saline lands) are not threatened by human activities. For these reasons, we suggest that its current protection status is inappropriate and should be changed to Least Concern.

Distribution: Orenburg Region: Akbulak, Belyaevka, Dombarovka, Gai, Novoorsk, Sol'-Iletsk, Svetlyi, Yasnyi Districts, Orsk Town (Fig. 69).

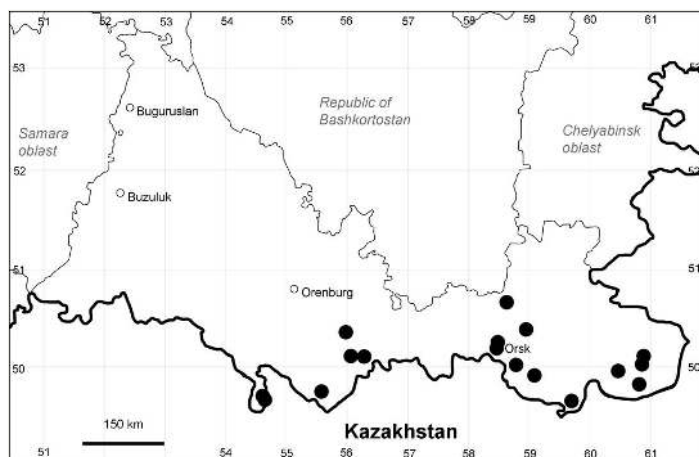


Figure 69. [doi](#)

Distribution map of *Anabasis salsa*.

Previous reports: Knjazez (2009).

The species occurs in petrophytic steppes, on saline lands. It has a limited distribution in the Region.

The species is distributed in Eastern Europe (south-eastern part), the Caucasus (Azerbaijan), south-western Siberia, Kazakhstan, western China (Xinjiang), western Mongolia.

***Arthrophytum lehmannianum* Bunge ex Litv.**

- IPNI [urn:lsid:ipni.org:names:163594-1](https://www.ipni.org/names/163594-1)

Nomenclature:

Arthrophytum lehmannianum Bunge ex Litv. in Trudy Bot. Muz. Imp. Akad. Nauk 11: 33 (1913).

Native status: Native.

Conservation status: Vulnerable (VU). D1.

The species is known from the only locality in Orenburg Region and Russia, isolated at the northern margin of its distribution area, where the only small population is known. It was observed in a petrophytic steppe on saline substrates, co-occurring with *Camphorosma monspeliaca*, *Artemisia nitrosa*, *Atriplex cana* etc. (Stepanova and Safronova 2019). The species population is situated next to the road and is in danger of further development of the road network. For this reason, legal protection is recommended.

Distribution: Orenburg Region: Yasnyi District (Fig. 70).

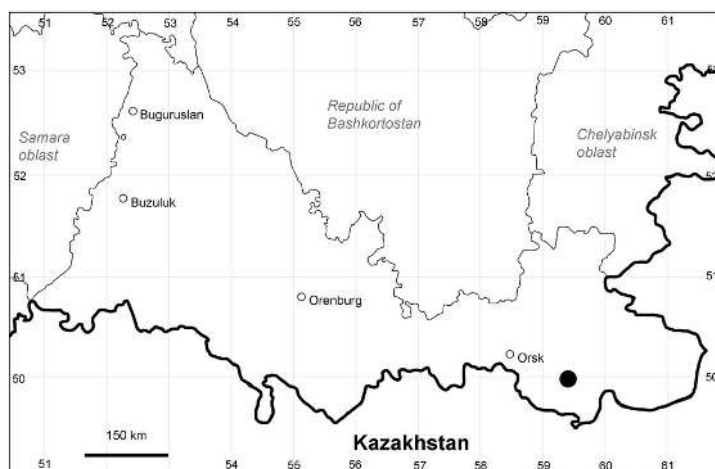


Figure 70. [doi](#)

Distribution map of *Arthrophytum lehmannianum*.

Previous reports: Stepanova and Safronova (2019).

The species occurs in petrophytic steppes. It is very rare in the Region.

The species is distributed in Eastern Europe (south-eastern part), Kazakhstan, western China. The record in Yasnyi District belongs to the only population found in Russia (Stepanova and Safronova 2019).

***Halogeton glomeratus* (M.Bieb.) Ledeb.**

- IPNI [urn:lsid:ipni.org:names:60448682-2](https://www.ipni.org/names/60448682-2)

Nomenclature:

Halogeton glomeratus (M.Bieb.) Ledeb., Icon. Pl. Fl. Ross. 1: 10 (1829) ≡ *Anabasis glomerata* M.Bieb., Mém. Soc. Imp. Naturalistes Moscou 1(ed. 2): 110 (1811).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 1,000 km², AOO 12 km². The species is found in a few localities in the south-eastern part of the territory and shows no tendency to decline.

Distribution: Orenburg Region (south-eastern districts): Svetlyi, Yasnyi Districts, Orsk Town (Fig. 71).

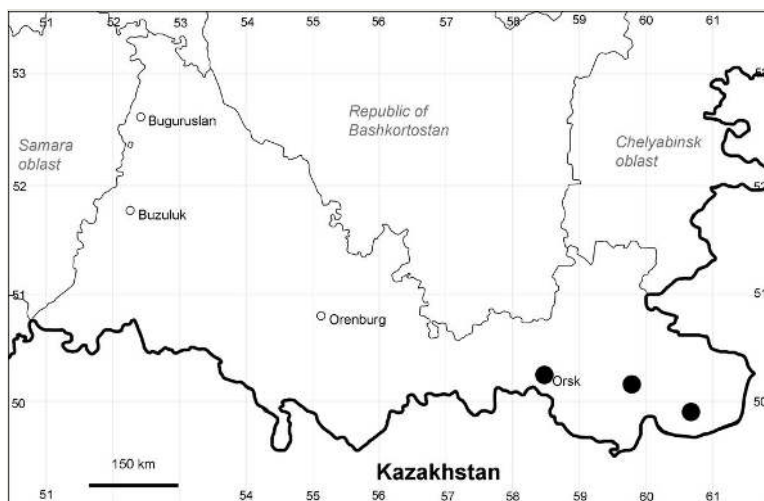


Figure 71. [doi](#)
Distribution map of *Halogeton glomeratus*.

Previous reports: Knjazez (2009).

The species occurs in steppes, on saline lands and in human-made habitats. It is found sporadically in the eastern part of the Region.

The species is distributed as native in Eastern Europe (southern Ural), Siberia, Central Asia, North Himalaya, Mongolia, western China. It is known as alien in North America.

***Salsola collina* Pall.**

- IPNI url.isid.org/ipni.org/names:166737-1

Nomenclature:

Salsola collina Pall., Ill. Pl.: 34 (1803) $\equiv$ *Kali collina* (Pall.) Akhani & Roalson, Int. J. Pl. Sci. 168(6): 946 (2007).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 107,700 km², AOO 108 km². The species is very common in the whole territory and shows no tendency to decline.

Distribution: Orenburg Region (whole territory): Adamovka, Aleksandrovka, Asekeevka, Belyaevka, Buguruslan, Buzuluk, Dombarovskii, Gai, Kurmanaevka, Kvarkeno, Matveevka, Novosergievka, Orenburg, Pervomaiskii, Ponomarevka, Saraktash, Sorochinsk, Totskoe, Yasnyi Districts (Fig. 72).

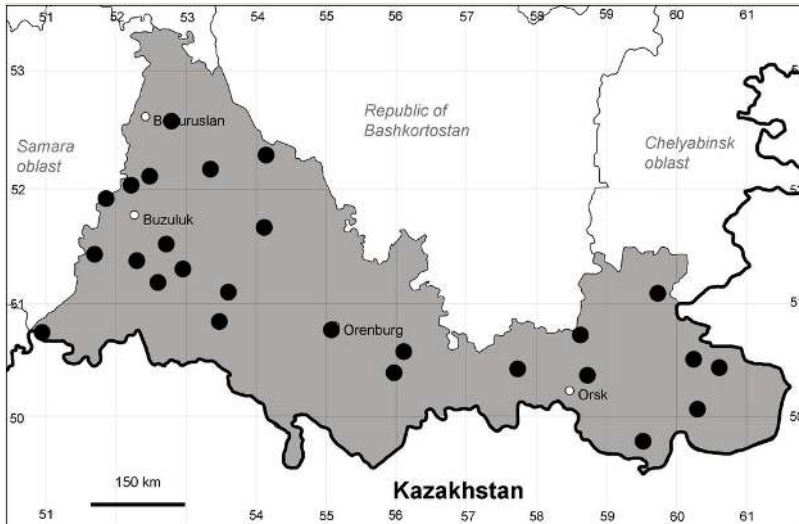


Figure 72. [doi](#)

Distribution map of *Salsola collina*, confirmed (points) and projected (shade) occurrence.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs in steppes, on saline lands and sands and in human-disturbed sites. It is common in the Region.

The species is distributed as native in Eastern Europe (south-eastern part) and across most of the arid Asia (Mongolia, China, Kyrgyzstan, mountainous parts of Kazakhstan, Tajikistan, southwards up to mountainous deserts of Karakoram). It is known as alien in the forest and forest-steppe zones of Eurasia.

***Salsola rosacea* L.**

- IPNI [urn:lsid:ipni.org:names:167034-1](http://www.ipni.org/names/167034-1)

Nomenclature:

***Salsola rosacea* L.**, Sp. Pl. 1: 222 (1753) $\equiv$ *Kali rosaceum* (L.) Moench, Suppl. Meth.: 115 (1802).

Native status: Native.

Conservation status: Vulnerable (VU). D1.

The species is locally known only from Verblyuzhka Mount in a low number of individuals. This area is overgrazed due to the presence of several small livestock farms.

Distribution: Orenburg Region: Belyaevka District (Fig. 73).

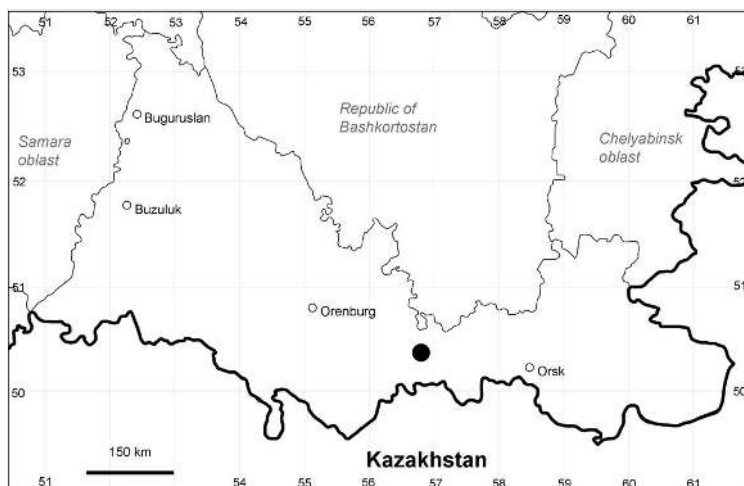


Figure 73. [doi](#)

Distribution map of *Salsola rosacea*.

Previous reports: Knjazev (2009).

The species occurs in petrophytic steppes.

It is distributed in Eastern Europe (south-eastern part), southern Siberia, Central Asia. So far, this is the only record of *Salsola rosacea* in Europe, at the very limit of the European territory.

***Salsola tamariscina* Pall.**

- IPNI [urn:lsid:ipni.org:names:167118-1](http://url.isid.org/names/167118-1)

Nomenclature:

Salsola tamariscina Pall., Ill. Pl.: 33 (1803) ≡ *Kali tamariscina* (Pall.) Akhani & Roalson, Int. J. Pl. Sci. 168(6): 946 (2007).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 117,300 km², AOO 104 km². The species is common in the whole territory and shows no tendency to decline.

Distribution: Orenburg Region (whole territory): Belyaevka, Buguruslan, Buzuluk, Krasnaya Gvardia, Kvarkeno, Novoorsk, Novosergievka, Orenburg, Pervomaiskii, Ponomarevka, Saraktash, Sol'-Iletsk, Svetlyi, Totskoe Districts, Orsk Town (Fig. 74).

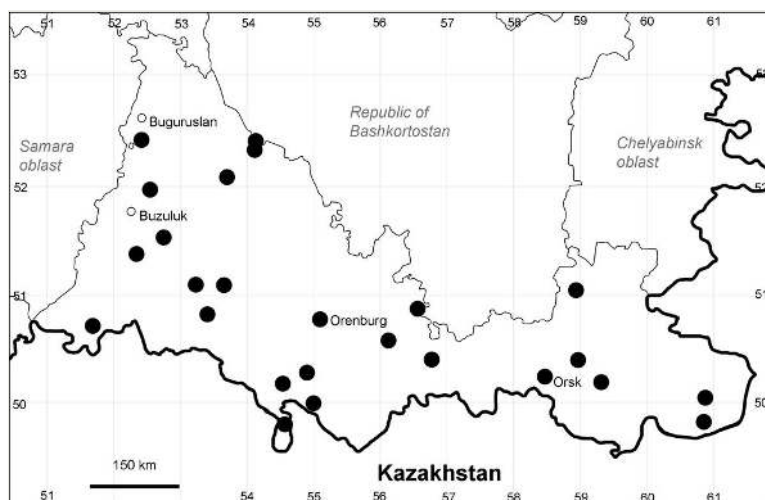


Figure 74. [doi](#)

Distribution map of *Salsola tamariscina*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazev (2009).

The species occurs in steppes, on saline lands and limestone. It is common in the Region.

The species is distributed in Eastern Europe (southern part), Kazakhstan, Uzbekistan, western China (Xinjiang).

***Salsola tragus* L.**

- IPNI [urn:lsid:ipni.org:names:307757-2](http://www.ipni.org/names/307757-2)

Nomenclature:

***Salsola tragus* L.**, Cent. Pl. 2: 13 (1756) $\equiv$ *Kali tragus* (L.) Scop., Fl. Carniol., ed. 2, 1: 175 (1772).

= *Salsola pestifer* A.Nelson, New Man. Bot. Centr. Rocky Mt., ed. 2: 169 (1909).

= *Salsola ruthenica* Iljin, Sornye Rast. SSSR 2: 137 (1934).

– *S. australis* auct.: Ryabinina (1998).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 62,800 km², AOO 40 km². The species is common in the whole territory and shows no tendency to decline. Its actual distribution is predicted to be much wider than currently confirmed.

Distribution: Orenburg Region: Akbulak, Buzuluk, Gai, Ilek, Novoorsk, Pervomaiskii, Sol'-Iletsk, Tashla Districts, Orsk Town (Fig. 75).

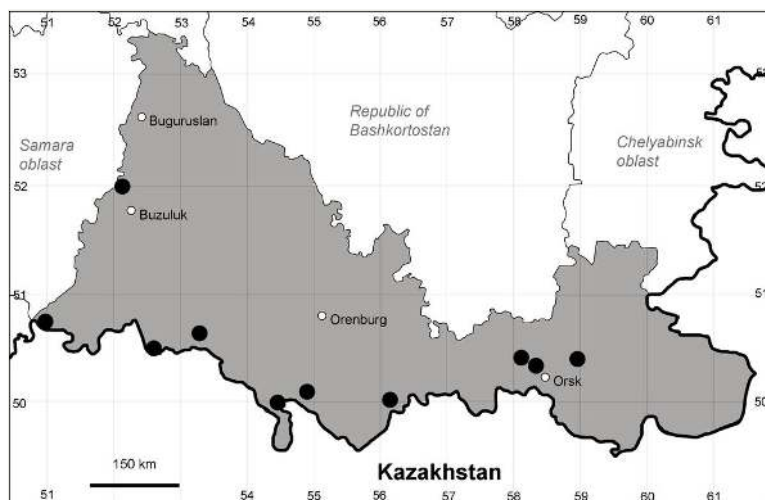


Figure 75. [doi](#)

Distribution map of *Salsola tragus*, confirmed (points) and projected (shade) occurrence.

Previous reports: Ryabinina (1998), Knjazez (2009).

The species occurs in steppes, on saline lands, sands and limestone and also in human-disturbed sites. It is frequent in the Region.

The species is distributed in Eurasia (extratropical). It is known as alien in North and South America.

***Soda acutifolia* (Bunge) Mosyakin, Freitag & Rilke**

- IPNI url.isid.ipni.org/names:60477034-2

Nomenclature:

Soda acutifolia (Bunge) Mosyakin, Freitag & Rilke, Isr. J. Pl. Sci. 64(1–2): 25 (2017) ≡ *Halogeton acutifolius* Bunge, Beitr. Fl. Russl.: 301 (1852).

= *Salsola mutica* C.A.Mey., Bull. Soc. Nat. Mosc. 27(2): 455 (1854).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 66,700 km², AOO 32 km². The species is common in some parts of the territory. No decline is observed or projected.

Distribution: Orenburg Region: Gai, Kurmanaevka, Kvarkeno, Pervomaiskii, Sol'-Iletsk, Svetlyi, Yasnyi Districts (Fig. 76).

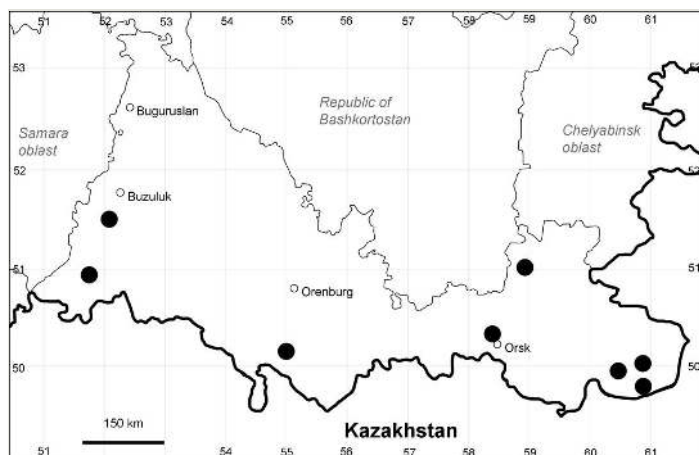


Figure 76. [doi](#)

Distribution map of *Soda acutifolia*.

Previous reports: Knjazez (2009).

The species occurs on saline soils. It is sporadically observed in the Region.

The species is distributed in Eastern Europe (south-eastern part) and Kazakhstan.

Soda foliosa (L.) Akhani

- IPNI [urn:lsid:ipni.org:names:77215009-1](https://www.ipni.org/names/77215009-1)

Nomenclature:

Soda foliosa (L.) Akhani, Front. Pl. Sci. 11-546518: 30 (2020) $\equiv$ *Anabasis foliosa* L., Sp. Pl. 1: 223 (1753) $\equiv$ *Salsola foliosa* (L.) Schrad. ex Schult. in Roemer & Schultes, Syst. Veg., ed. 15[bis], 6: 235 (1820) $\equiv$ *Neocaspia foliosa* (L.) Tzvel., Ukr. Bot. Zhurn. 50(1): 81 (1993).

Native status: Native.

Conservation status: Least Concern (LC).

The species is found in two localities in the south-eastern part of the territory. Despite its limited distribution, its habitats (saline lands) are not under threat and the populations show no tendency to decline.

Distribution: Orenburg Region: Svetlyi District (Fig. 77).

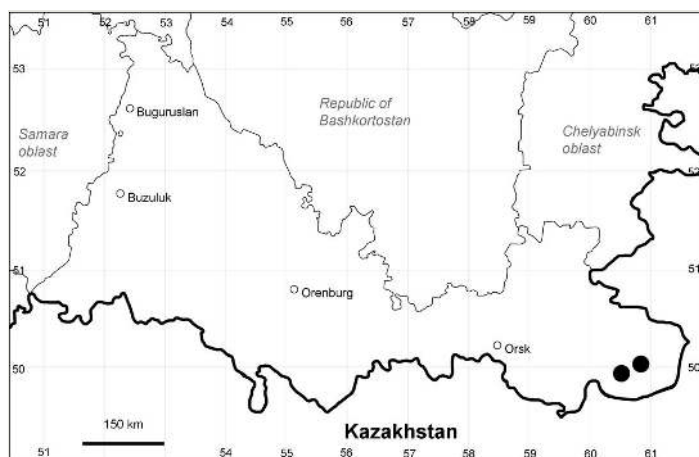


Figure 77. doi

Distribution map of *Soda foliosa*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on saline soils and limestones. It is sporadically observed in the easternmost part of the Region.

The species is distributed in Eastern Europe (south-eastern part), Kazakhstan, western China, Mongolia.

***Soda inermis* (Moench) Fourr.**

- IPNI [urn:lsid:ipni.org:names:167375-1](http://www.ipni.org/names/167375-1)

Nomenclature:

Soda inermis (Moench) Fourr., Ann. Soc. Linn. Lyon, sér. 2, 17: 145 (1869) $\equiv$ *Salsola soda* L., Sp. Pl. 1: 223 (1753) $\equiv$ *Kali inermis* Moench, Methodus: 331 (1794).

Kali inermis Moench is a legitimate name due to the simultaneous publication of *Kali soda* Moench, nom. illeg. (Moench 1794).

Native status: Native.

Conservation status: Least Concern (LC).

EOO 30,600 km², AOO 24 km². The species has a sparse, but wide distribution in the territory, without apparent threats to its populations.

Distribution: Orenburg Region: Kurmanaevka, Orenburg, Sol'-Ilets, Svetlyi Districts (Fig. 78).

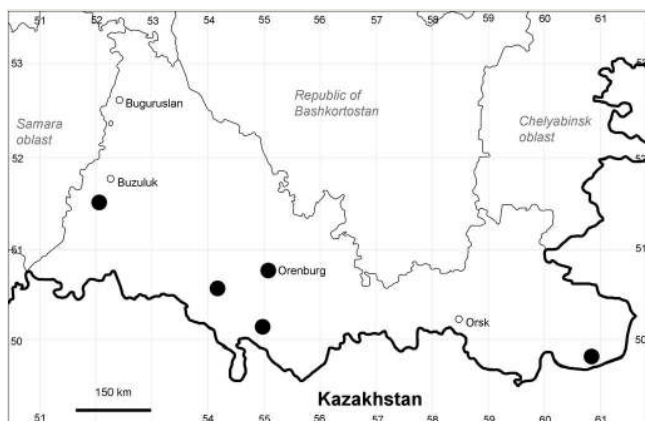


Figure 78. [doi](#)

Distribution map of *Soda inermis*.

Previous reports: Iljin (1930), Ryabinina (1998), Knjazez (2009).

The species occurs on saline substrates. It is rare in the Region.

The species is distributed in Southern and Eastern Europe, Kazakhstan, West Asia, North Africa. It is known as alien in North and South America.

Excluded taxa

Atriplex hortensis L.

Distribution: Some specimens of this species are known in the northern territories, for example, Sverdlovsk Region (SVER!) and Bashkortostan (LE!). In the steppe zone, *A. hortensis* needs a freshwater irrigation and the salinisation effect is damaging the seed germination of the species, thus making its spontaneous occurrence difficult.

Notes: This species was reported as occurring in large populated places of Orenburg Region (Iljin 1930, Ryabinina 1998, Knjazez 2009), but no specimens were seen. Nevertheless, it may be found as cultivated in gardens as an ornamental plant.

Atriplex rosea L.

Distribution: It has disappeared from almost all territories of European Russia where it was collected in the 19th and first third of 20th centuries and all old specimens were collected in the areas located westwards of the Volga (Sukhorukov 2006, Sukhorukov et al. 2022), thus outside of Orenburg Region.

Notes: Reported by Ryabinina (1998) and Knjazez (2009). No specimens seen.

***Chenopodium acuminatum* Willd.**

Distribution: A species widely distributed from Central Kazakhstan, South Siberia, Central Asia and temperate Far East.

Notes: Previously reported by Ryabinina (1998) and Knjazev (2009).

All specimens seen from Orenburg Region belong to *Chenopodium album* L. or *C. betaceum* Andr. Nevertheless, future records are possible due to its presence in the neighbouring Kurgan Region (NSK!, SVER!).

***Chenopodium karoï* (Murr) Aellen**

Distribution: It is distributed in temperate Asia and often confused with other species (Lomonosova and Uotila 2022). In the last three decades, *C. karoï* was found as an alien plant along railroad embankments in the neighbouring Bashkortostan Republic (SVER!).

Notes: Knjazev (2009) reported this species as a rare alien occurring on railway embankments in western districts of Orenburg Region. No specimens were seen.

***Chenopodium praetericola* Rydb.**

Distribution: A North American species often confused with the native narrow-leaved *Chenopodium album* and *C. betaceum*. Its presence in European Russia is still doubtful. Identifications can be proven by measurements of the seed coat thickness (Sukhorukov and Zhang 2013, Sukhorukov 2014) and molecular phylogeny.

Notes: Knjazev (2009) reported this alien species from the Guberlya Mts. No specimens were seen to confirm this record.

***Chenopodium suecicum* Murr.**

Distribution: Northern Eurasia.

Notes: Ryabinina (1998) reported this segregate of the *Chenopodium album* L. aggr. as occurring on ruderal places in the whole Orenburg Region. While the species occurrence is possible in this territory, no herbarium specimens were found to confirm this record.

***Chenopodium vulvaria* L.**

Distribution: Mediterranean, West Asia, Iran, southern Central Asia, Himalayas (Groom 2015, Lomonosova and Uotila 2022).

Notes: This species was reported as a rare plant possibly occurring in the western part of Orenburg Region (Knjazev 2009), although it has been previously believed to occur throughout the whole territory (Ryabinina 1998). Some voucher specimens seen in ORIS belong to the *Chenopodium album* aggregate and no specimens of *C. vulvaria* from the entire Volga-Ural region were seen by the first author.

***Climacoptera affinis* (C.A.Mey. ex Schrenk) Botsch.**

Distribution: Central Asia.

Notes: The species was once collected by Antonov in 1852 “near Orsk town” (LE). More recent collections are absent from Orenburg Region. The species is widely distributed in central and eastern Kazakhstan.

***Climacoptera crassa* (M.Bieb.) Botsch.**

Distribution: Central Asia.

Notes: Iljin (1930) reported this species from Orenburg on the basis of a single old specimen collected by Karelin in the mid-19th century. This occurrence has not been confirmed by recent specimens. The northern limit of this species distribution area lies south of Orenburg Region, in the southern part of Aqtöbe Region of Kazakhstan.

***Halimocnemis karelinii* Moq.**

Distribution: Central Asia.

Notes: There is one old collection from Orenburg Region with the label that reads “Orsk, 1852, Antonov” (LE). We believe that this specimen was collected south of Orenburg Region, apparently in Aqtöbe Region of Kazakhstan. The species is common in southern Kazakhstan.

***Petrosimonia oppositifolia* (Pall.) Litv.**

Distribution: Eastern and South-Eastern Europe, Central Asia.

Notes: Ryabinina (1998) reported this species from four districts of Orenburg Region. However, voucher specimens are absent in herbarium collections. Although the presence of this species is logically possible in the Region, we exclude it from the list due to the lack of documentation.

***Salsola paulsenii* Litv.**

Distribution: SE Europe (Astrakhan Region, Kalmyk Republic), Central Asia, Afghanistan, Iran, NW China.

Notes: Collected by Antonov in 1852 “near Orsk town”, but this record was not confirmed by later specimens. At that time, Orenburg Region was a very remote location and one of the outposts of the Russian Empire. The exact location of these records cannot be properly established and the species was seemingly collected by Antonov in northern Kazakhstan.

***Xylosalsola arbuscula* (Pall.) Tzvel.**

Distribution: SE Europe (Astrakhan and Volgograd Regions), Central Asia.

Notes: Collected by Antonov in 1852 “near Orsk town” (LE), but not confirmed by later gatherings. The nearest localities are known in Central Kazakhstan. So far, this conspicuous plant has not been observed during floristic work in Orenburg Region (Ryabinina 1998, Knjazev 2009).

Discussion

Data collection and species distributions

So far, our sampling is the most comprehensive attempt of data collection for Chenopodiaceae in Orenburg Region. Regarding less common species, especially those currently under legal protection, our distribution maps demonstrate that the coverage increased substantially due to the recent collection effort and the inclusion of all available herbarium specimens, especially those kept in smaller and local collections.

At the same time, we acknowledge that our current data remain partly deficient because of still insufficient sampling, especially of common and taxonomically critical taxa. Recent accounts (Ryabinina 1998, Knjazev 2009) assume broader distributions of some species; however, we were not able to verify those distributional data because of the lack of vouchers.

Although Chenopodiaceae are characteristic of arid zones as a whole, several species of this family occur at their zonal limits of distribution in Orenburg Region. For example, *Atriplex oblongifolia*, *A. patens*, *Ceratocarpus arenarius*, *Krascheninnikovia ceratoides*, *Salicornia perennans*, *Suaeda acuminata*, *S. corniculata*, *Bassia prostrata*, *Camphorosma lessingii*, *C. monspeliaca* etc. are characteristic of the northern steppes, whereas the northern limits of *Agriophyllum pungens*, *Halocnemum strobilaceum*, *Kalidium caspicum*, *K. foliatum*, *Bassia hyssopifolia*, *B. laniflora*, *Spirobassia hirsuta*, *Ofaiston monandrum*, *Petrosimonia brachyphylla*, *Anabasis salsa*, *Pyankovia brachiata*, *Arthrophytum lehmannianum*, *Halogeton glomeratus* etc. largely belong to the true steppes of Orenburg Region and the semi-deserts of northern Kazakhstan. Such patterns were used in phytogeographic studies by Krascheninnikov (1925) and revealed in Chenopodiaceae by Iljin (1930). We confirm the significance of zonal patterns in Chenopodiaceae using a denser geographical sampling, although we also observed that these patterns are partly blurred in Orenburg Region. For example, typical dominant plants of semi-deserts, *Atriplex*

cana and *Suaeda physophora*, extensively penetrate into true steppes, but occur sporadically there, in smaller populations.

Species richness

To date, 76 species of Chenopodiaceae are confirmed to occur in Orenburg Region (Table 1). This number is much higher than in the neighbouring administrative territories (Bashkortostan Republic, Kurgan, Rostov, Samara, Saratov Regions), is comparable to the count in Astrakhan Region and slightly lower than those in Volgograd Region and Dagestan Republic. The territories situated in the forest zone are not included in the comparisons due to the drastically decreasing species numbers.

Table 1.

Species richness of Chenopodiaceae in Orenburg Region and other southern administrative territories of Russia.

Administrative territory	Species number	Source
Astrakhan Region	75	Sukhorukov (unpubl. data)
Republic of Bashkortostan	57	Muldashev et al. (2017)
Chelyabinsk Region	62	Kulikov (2010)
Republic of Dagestan	82	Murtazaliev (2009)
Kurgan Region	44	Naumenko (2008)
Orenburg Region	76	Present study
Samara Region	45	Sukhorukov (unpubl. data)
Saratov Region	62	Sukhorukov (unpubl. data)
Rostov Region	53	Sukhorukov (unpubl. data)
Volgograd Region	80	Sukhorukov (unpubl. data)

Conservation

Although most of the Chenopodiaceae species in Orenburg Region are either common or confined to the habitats which are not exploited by humans (e.g. saline substrates), some of these species may be rare and threatened because of being situated at the margin of their distribution or because of being restricted to the habitats intensely used (e.g. calcareous deposits).

Two species (*Anabasis cretacea*, *Nanophyton erinaceum*) occur mostly on calcareous denudations, which can be destroyed by mining in the absence of protection; they are protected starting from the first edition of the regional Red Data Book. Two species (*Anabasis salsa* and *Kalidium foliatum*) are currently protected, because their populations are situated on the margin of their distribution. We propose adding two more species, *Arthrophytum lehmannianum* and *Salsola rosacea*, to the same category because their

populations in Orenburg Region are small and situated outside the main area as the northernmost or westernmost foreposts of the species distributions.

We recommend to exclude *Petrosimonia triandra* from the Red Data Book of Orenburg Region, because the actual distribution of this species, as circumscribed in our study, was found much greater than previously assumed and no apparent reduction in its population size or occurrence was observed or projected. Similarly, *Kalidium foliatum* and *Anabasis salsa* are proposed for exclusion because their populations are situated in saline lands, which are not threatened by anthropogenic disturbance.

As a general observation, the conservation status of Chenopodiaceae species in Orenburg Region depends on plant habitats. We do not consider species occurring on saline lands (even those with restricted distributions) as threatened because this habitat is not used in economic activities and is not under immediate threat of destruction or significant degradation. On the other hand, calcareous outcrops are the traditional target of mining for construction works and plants restricted to this habitat may be threatened due to the loss of habitats. Plants occurring in petrophytic steppes, although these habitats are outside of particular economic interest, may also be threatened because their populations may be situated near roads and may be destroyed by the expansion of the road network or because of grazing by domestic livestock. The primary importance of habitat threatening was underestimated in the previous work on plant conservation in Orenburg Region (Belov 2019), which focused more on plant rarity and, therefore, arrived at different conclusions.

Vegetation features

Xerophilous grasslands, or temperate steppe

Apart from Poaceae and many Asteraceae (mostly represented by *Artemisia* spp.), subshrubby *Bassia prostrata* and *Krascheninnikovia ceratodes* (Fig. 79b) dominate in this type of natural community (Fig. 80a), sometimes with *Caroxylon laricinum*. Depending on different degrees of steppe disturbance, the annual Chenopodiaceae (*Atriplex oblongifolia*, *A. sagittata*, *Ceratocarpus arenarius*, *Chenopodium album*, *Oxybasis urbica*, *Sedobassia sedoides*, *Salsola tamariscina*) can be more or less abundant in grasslands or form patches of different origin, for example, influenced by the activities of *Marmota bobak*, erosion or human-based activities. According to our observations, some other true steppe annuals like *Atriplex sphaeromorpha* and *Petrosimonia monandra* are very rare in Orenburg Region and much more frequent in steppes and semi-deserts of Kazakhstan.

Petrophytic steppe

This steppe subtype (Fig. 80b) is locally distributed in the central, western and south-eastern parts of Orenburg Region. Due to an increased salt content in the soil, uneven microrelief and stony substrate, petrophytic steppe is unsuitable for agriculture or contains plants not eaten by livestock (e.g. many Chenopodiaceae: Iljin (1936)). For these reasons, petrophytic steppes are usually less degraded compared with other open plant communities. Among other widespread plants, for example *Alyssum tortuosum*

(Brassicaceae), *Artemisia lerchiana* (Asteraceae), *Limonium suffruticosum* (Plumbaginaceae) and *Scabiosa isetensis* (Caprifoliaceae), the Chenopodiaceae are represented by the subshrubby *Nanophyton erinaceum*, as well as by *Anabasis cretacea* and *Atriplex cana*, both latter species being more typical of other natural vegetation types. Another subshrubby petrophytic species, *Arthrophytum lehmannianum*, was found only recently as a single small population (Stepanova and Safronova 2019). The annuals *Salsola collina* and *S. tamariscina* (Fig. 79c) are also common in petrophytic communities.

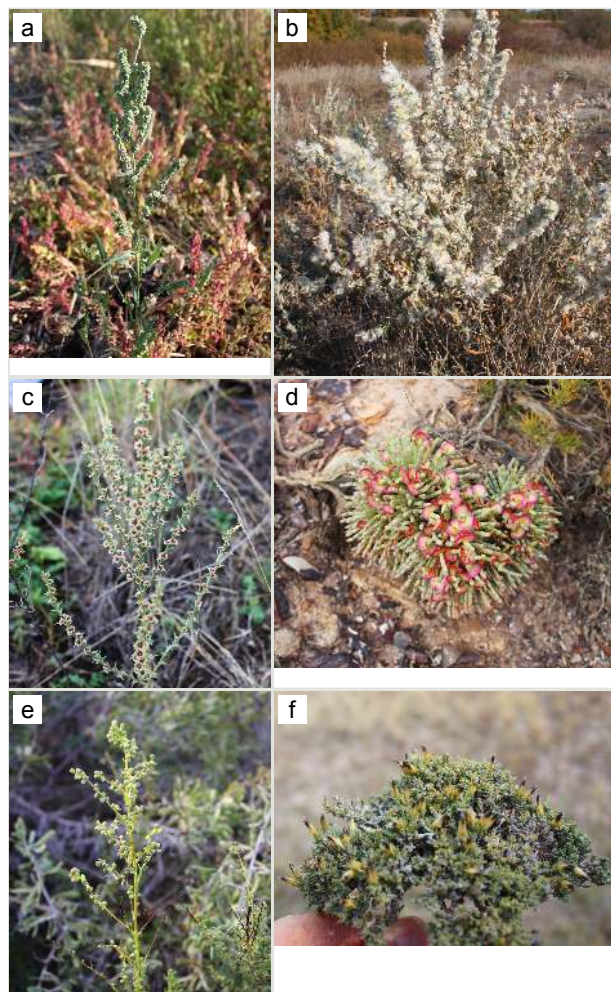


Figure 79.

Plant portraits of Chenopodiaceae in Orenburg Region.

- a: *Atriplex laevis* (Svetlyi District, 25.09.2020, A. Sukhorukov). [doi](#)
 b: *Krascheninnikovia ceratoides* (Adamovka District, 27.09.2020, A. Sukhorukov). [doi](#)
 c: *Salsola tamariscina* (Buguruslan District, 21.09.2020, A. Sukhorukov). [doi](#)
 d: *Anabasis cretacea* (Yasnyi District, 22.09.2020, A. Sukhorukov). [doi](#)
 e: *Suaeda linifolia* (Svetlyi District, 25.09.2020, A. Sukhorukov). [doi](#)
 f: *Nanophyton erinaceum* (Yasnyi District, 22.09.2020, A. Sukhorukov). [doi](#)

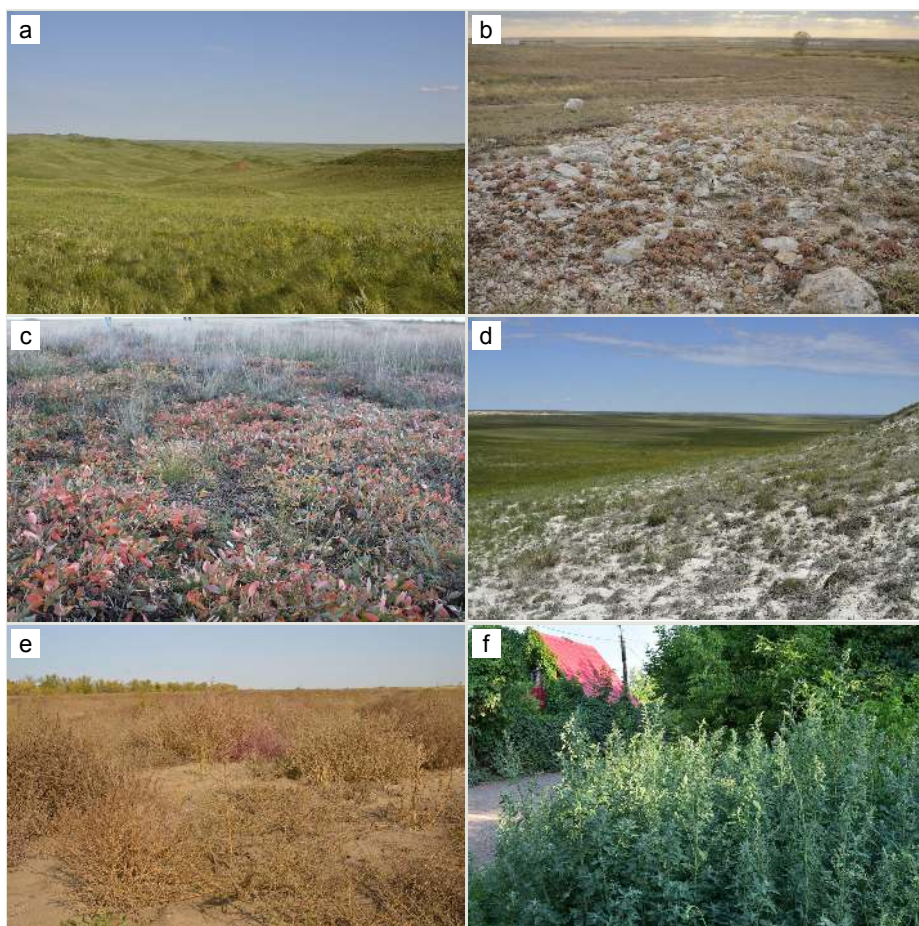


Figure 80.

Characteristic landscapes of Chenopodiaceae in Orenburg Region.

a: Steppe (Kuvandyk District, 08.06.2015, Ya. Golovanov). [doi](#)

b: Petrophytic steppe (Yasnyi District, 23.09.2020, N. Stepanova). [doi](#)

c: Saline lands with *Halimione verrucifera* as a dominant (Yasnyi District, 25.09.2020, A. Sukhorukov). [doi](#)

d: Calcareous outcrops (Sol'-Iletsk District, 07.06.2018, Ya. Golovanov). [doi](#)

e: Sands (Sol'-Iletsk District, 28.09.2020, N. Stepanova). [doi](#)

f: Ruderal vegetation (Orenburg City, 09.07.2020, Ya. Golovanov). [doi](#)

Halophytic plant communities

Halophytic plant communities (Fig. 80c) are represented by 'solonetz' and 'solonchak' communities, differing in the level of salinity. They are very common in the southern and eastern parts of Orenburg Region. Nevertheless, the subshrubby chenopodiaceous plants are unevenly distributed across the territory. *Kalidium foliatum*, *Atriplex laevis* (Fig. 79a) and *Suaeda linifolia* (Fig. 79e) are restricted to its south-eastern part (solonchaks on dried-up salt lakes and ponds), *Suaeda physophora* is distributed in the eastern part, *Atriplex*

cana and *Anabasis salsa* are stretching through the south and east and *Halimione verrucifera* is found across the territory. All of them are at the northern limit of distribution. Other subshrubs (*Camphorosma* spp.) and the annuals *Atriplex patens*, *A. tatarica*, *Camphorosma songorica*, *Oxybasis chenopodioides*, *Petrosimonia litvinovii*, *P. triandra*, *Salicornia perennans*, *Suaeda* spp. and *Sedobassia sedoides* are common elements of diverse halophytic communities. In general, the role of the subshrubby Chenopodiaceae increases from the north towards the south and east.

Limestone and chalk formations

Calcareous outcrops (Fig. 80d) are locally found in the territory, especially in its southern part. *Anabasis cretacea* (Fig. 79d) and *Nanophyton erinaceum* (Fig. 79f) are characteristic of chalk hills (Golovanov et al. 2021); the subshrubby *Bassia prostrata*, *Krascheninnikovia ceratoides* and *Caroxylon laricinum* and the annuals *Blitum virgatum*, *Salsola tamariscina* and *Soda foliosa* often occur in both chalk and limestone formations.

Sands

Psammophyte communities (Fig. 80e) are not uniform in their species composition. Riverbank soil ecosystems, particularly along the Ural River, the major watercourse in the region, include several mesophytic Chenopodiaceae (*Atriplex prostrata*, *Chenopodium acerifolium*, *Corispermum squarrosum*, *Oxybasis rubra*, *O. glauca*), but some of them (*Chenopodium acerifolium*, *Corispermum squarrosum*) are undercollected and considered rare in the territory. Sandy steppe is another type of the psammophytic vegetation. This kind of steppes or meadows is xerophytic and contains other chenopodiaceous species (native *Bassia laniflora*, *Corispermum hyssopifolium*, *Salsola collina*, *Salsola tragus*, alien *Corispermum declinatum*), as well as the rare native *Agriophyllum pungens* in the south. Recently, *Chenopodium virgatum* was discovered in degraded sandy steppe communities.

Disturbed lands

Some annual Chenopodiaceae are noxious ruderal plants. *Atriplex sagittata*, *Chenopodium album*, *Chenopodiastrum hybridum*, *Oxybasis urbica* and *Salsola collina* are the most common species along roadsides (Fig. 80f), degraded fluvial terraces and other dump places. *Atriplex micrantha*, with scattered occurrences in halophytic communities, was recently found in ruderal plant communities (collected by APS in Orenburg City in 2021). *Atriplex patula*, one of the most common ruderal plants in the forest-steppe and broad-leaved forest subzones, is not frequently found in Orenburg Region.

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Author contributions

Fieldwork: APS, NYS, OGG, YMG. Data collection and analysis: APS, MAK, ANS. Writing: APS, YMG, ANS. Final proofreading and editing: all authors.

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Supplementary material

Suppl. material 1: Voucher specimens for the revision of Chenopodiaceae in Orenburg Region, Russia [doi](#)

Authors: Sukhorukov, A.P.

Data type: occurrences

Brief description: Occurrence dataset based on herbarium specimens and human observations, formatted according to DarwinCore standard.

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