

UDC 581.8
AGRIS F70

<https://doi.org/10.33619/2414-2948/121/13>

**BIOECOLOGICAL FEATURES AND USE DIRECTIONS
OF SPECIES BELONGING TO THE GENUS *Salsola* L. SPREADING
IN THE NAKHCHIVAN AUTONOMOUS REPUBLIC FLORA**

©**Mammadli T.**, ORCID: 0009-0008-2961-9698, Ph.D., Nakhchivan State University,
Nakhchivan, Azerbaijan, turan12beymemmed1948@gmail.com

©**Alakbarova N.**, ORCID: 0009-0002-2900-2301, Nakhchivan State University,
Nakhchivan, Azerbaijan, nrcnalekberova@gmail.com

©**Mammadova Ja.**, ORCID: 0009-0009-4049-0693 Nakhchivan State University,
Nakhchivan, Azerbaijan, memmedovajale033@gmail.com

**БИОЭКОЛОГИЧЕСКИЕ ОСОБЕННОСТИ И НАПРАВЛЕНИЯ ИСПОЛЬЗОВАНИЯ
ВИДОВ РОДА *Salsola* L., РАСПРОСТРАНЕННЫХ ВО ФЛОРЕ
НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКИ**

©**Мамедли Т.**, ORCID: 0009-0008-2961-9698, канд. биол. наук,
Нахчыванский государственный университет,
г. Нахчыван, Азербайджан, turan12beymemmed1948@gmail.com

©**Алекбарова Н.**, ORCID: 0009-0002-2900-2301, Нахчыванский государственный
университет, г. Нахчыван, Азербайджан, nrcnalekberova@gmail.com

©**Мамедова Д.**, ORCID: 0009-0009-4049-0693, Нахчыванский государственный университет,
г. Нахчыван, Азербайджан, memmedovajale033@gmail.com

Abstract. As a result of the research, it was found that the genus *Salsola* L., which was involved in the study in the flora of the Nakhchivan Autonomous Republic, belongs to the family *Chenopodiaceae* Vent. The family has 100 genera and 1600 species distributed in the world. Of these, 101 species belonging to 33 genera are distributed in the flora of Azerbaijan. There are 30 genera and 76 species in the territory of the Nakhchivan Autonomous Republic. From the systematic review, it is known that there are 13 species of the genus *Salsola* L., which belongs to the family *Chenopodiaceae* Vent. in the autonomous republic. In this regard, the species composition, distribution patterns of species, origin and other specific features of the genus *Salsola* L. were investigated in the research work. A study was conducted on the soil types and altitudinal zones where the genus is distributed. Most of the species belonging to the genus *Salsola* L. are used in ornamental plants, medicine, and the chemical industry, as they have significant feed value, and none of the species are poisonous. The quality percentage of meat of cattle and small-horned animals fed with it increases.

Аннотация. В результате проведенных исследований установлено, что род *Salsola* L., который был вовлечен в исследование во флоре Нахчыванской Автономной Республики, относится к семейству *Chenopodiaceae* Vent. Семейство насчитывает 100 родов и 1600 видов, распространенных в мире. Из них во флоре Азербайджана распространены 101 вид, относящиеся к 33 родам. На территории Нахчыванской Автономной Республики встречаются 30 родов и 76 видов. Из систематического обзора известно, что на территории автономной республики встречается 13 видов рода *Salsola* L., который относится к семейству *Chenopodiaceae* Vent. В связи с этим в научно-исследовательской работе были изучены видовой состав, закономерности распространения видов, происхождение и другие

специфические особенности рода *Salsola* L. Было проведено исследование типов почв и высотных поясов распространения рода. Большинство видов рода *Salsola* L. используются в декоративных растениях, медицине и химической промышленности, поскольку обладают значительной кормовой ценностью, и ни один из видов не ядовит. При кормлении этим растением повышается качество мяса крупного рогатого скота и мелкорогатого скота.

Keywords: Systematics, saline soils, population, subalpine, vegetative organs.

Ключевые слова: систематика, засоленные почвы, популяция, субальпийские пояса, вегетативные органы.

We have studied the species composition, distribution patterns, origin and other specific features of the genus *Salsola* L.. Species of the genus *Salsola* L., which are widespread in the flora of the Nakhchivan Autonomous Republic, are widespread in saline soils, steppe or coastal regions. Saline plants can survive in this environment by absorbing salt and having a metabolic system adapted to it. These plants usually consist of species that can purify water or naturally grow in saline conditions. Examples of saline plants include halophytes and salt grasses. These plants are of great importance for both ecology and agriculture, as they can help improve the quality of soil and water in steppe environments. Due to the high ontogenetic variability of representatives of the genus *Salsola* L., comparative study of the complete life cycle and different characteristics at all stages of plant development is of great importance. *Salsola* L. is a plant genus belonging to the family *Chenopodiaceae* Vent. It is found in a variety of ecosystems, mainly distributed in arid and semi-arid regions. The genus is also known as "sand bushes" or "wild bushes". The species of this genus are mainly perennial or annual plants. The genus *Salsola* L. has a variety of plant forms. Some species are perennial shrubs, while others are biennial herbs. The plants are usually short or medium-sized. The leaves of these plants are usually long, sharp or lanceolate, sometimes thorny. The flowers are usually small, solitary or loosely grouped. The flowers are often few, sometimes pollinated by wind. The fruits are usually seeds and are adapted to harsh conditions. These seeds are mainly spread by wind [14-26].

Material and methodology of the research

In order to study the bioecological characteristics and directions of use of species belonging to the genus *Salsola* L. distributed in the flora of the Nakhchivan Autonomous Republic, the distance from the subalpine to the alpine zone of the Khaznadare, Demirlidagh and Arachig mountain areas in the Julfa region, the Gamigaya and Gapijig mountain areas in the Ordubad region, and the forest-bush massifs of the Batabat forest in the Shahbuz region were taken as the main observation and experimental areas.

In order to study the genus *Salsola* L. distributed in the flora of the Nakhchivan Autonomous Republic, herbarium specimens stored in the herbarium funds of the Institute of Bioresources of the Nakhchivan branch of the Azerbaijan National Academy of Sciences and personally collected, the work "Flora Kavkaza" were used, phenological observations were made by E. M. Lavrenko, I. N. Beydeman and others [1-13].

Discussion and results of the research

The genus *Salsola* L. consists of perennial or annual plants adapted to living conditions in arid, semi-arid and saline areas. These plants are both ecologically and economically important. Their adapted characteristics help them play an important role in ecosystems. The family

Tarachichekli is dominant due to its distribution in saline soils. The Tarachichekli family, which is mainly distributed in dry climates, has 81 species belonging to 28 genera in the Nakhchivan region. The taxonomic composition of the species belonging to the genus *Salsola* L. in the flora of the area is as follows. Taxonomic overview of the genus *Salsola* L. in the flora of the Nakhchivan Autonomous Republic:

Fam.: *Chenopodiaceae* Vent.

Genus: *Salsola* L. (Caspia Galuschko)

(1) *S. australis* R.Br. (*S. pestifer* Nels.)

(2) *S. camphorosma* Iljin

(3) *S. cana* C. Koch

(4) *S. crassa* Bieb.

(5) *S. dendroides* Pall.

(6) *S. ericoides* Bieb.

(7) *S. futilis* Iljin

(8) *S. nitraria* Pall. (*S. macera* Litv.)

(9) *S. nodulosa* (Moq.) Iljin = *S. gemmascens* Pall. subsp. *nodulosa* (Moq.) Botsch.

(10) *S. soda* L.

(11) *S. stellulata* Korov.

(12) *S. tamamschjanae* Iljin

(13) *S. tomentosa* (Moq.) Spach (*S. takhtadshjanii* Iljin; *S. flavovirens* Iljin)

The systematic review shows that there are 13 species of the genus *Salsola* L. (Caspia Galuschko), belonging to the family *Chenopodiaceae* Vent. - in the Autonomous Republic. *Salsola australis* R.Br. (*S. pestifer* Nels.) - Australian saltwort. Its common name in flora is also called prickly saltwort among the people. The plant is a species that often colonizes dry or slightly saline areas due to its biodiversity. It is an annual or biennial herb up to 1 m tall. The ribbed leaves are fleshy. The stems are glabrous or sparsely coarsely hairy, sometimes warty. The leaves are mainly alternate on the stems, 0.5-4 cm long, 0.5-6 mm wide. The stem of the leaf bases continues downwards [28].



Figure 1. *Salsola australis* R.Br. (*S. pestifer* Nels.)

Salsola cana C. Koch. — a plant species belonging to the *Chenopodiaceae* Vent. family. According to the IUCN, the category and status of the species belongs to the category “Vulnerable to extinction” — VU D2. It is a rare species growing in Azerbaijan [1].

The stem is a silvery-gray semi-shrub, 20-35 cm high, covered with short hairs. The leaves are 2-3 cm long, 1-2 mm wide, alternately linear, semi-cylindrical, hard, blunt, dense, short, covered with whitish-gray hairs, naked at the end of vegetation. The sepals are slightly smaller, slightly longer than the flower. The seeds are arranged vertically. The flowering and fruiting period falls on September-November. Xerophyte, light-loving, resistant to salinization. Propagated by seeds. Found on dry, saline, clay or clay-stony slopes. It forms cereal-shoangal groupings in saline areas. It was widespread in the Nakhchivan plain (Julfa region — around Yayci village), Gulustan plain [27].

Salsola nitraria Pall. (*S. macera* Litv.) — is a salt-resistant plant, mainly distributed in saline and arid areas. It is found in the form of a perennial subshrub or bush. The root system is strongly developed, has a deep root system. This feature makes it easier for the plant to survive in saline and arid soils. The stem is multi-branched, woody and hard. Its leaves have small, narrow, needle-like or fleshy leaves. To reduce water loss, the leaves are covered with wax or hairs. It blooms in July-September, forming small green or reddish flowers. Its seeds are light and spread by the wind [15-26].



Figure 2. *Salsola cana* C. Koch.



Figure 3. *Salsola nitraria* Pall. (*Salsola macera* Litv.)

Drought-resistant. Can survive with minimal water requirements. Adapted to flat soils. Grows in saline and salt marsh areas. It is a photophilous (light-loving) plant, develops better in sunny areas.

Table

Salsola L. (Caspia Galuschko) – Altitude zone and soils where the *Salsola* genus spread

Names of the Species	Altitude zone	Soils of Spreading
<i>Salsola paulsenii</i> Litv.	Plain	sandy, saline soils
<i>S. futilis</i> Iljin.	low mountain zone	clayey-rocky slopes
<i>S. nitraria</i> Pall.	Plain	saline soils
<i>S. nodulosa</i> (Moq.) Iljin	from the plain down to the mountain range	gray-brown and brown semi-desert saline and salt-affected soils
<i>S. soda</i> L.	Plain	saline and brackish soils
<i>S. stellulata</i> Korov.	Plain	sandy slopes

Names of the Species	Altitude zone	Soils of Spreading
<i>S. tamamschjanae</i> Iljin	low mountain zone	semi-desert, sandy soils
<i>S. tomentosa</i> (Moq.) Spach	Foothills	dry, rocky slopes
<i>S. incanescens</i> C.A.Mey.	Plain	sandy-clay saline areas
<i>S. cana</i> C.Koch	Plain	dry, saline, clay or clay-rocky slopes
<i>S. crassa</i> Bieb.	Plain	saline and brackish soils
<i>S. dendroides</i> Pall.	Plain and foothills	salted gray soils
<i>S. ericoides</i> Bieb.	from the plain down to the mountain range	salted, saline gray soils and brown semi-desert soils
<i>S. glauca</i> Bieb.	from the plain down to the mountain range	saline soils, clayey, rocky, saline slopes
<i>S. orientalis</i> S.G.Gmel	plain and low mountain range	gravelly slopes and clayey saline soils
<i>S. australis</i> R. Br.	Plain and foothills (rarely middle mountain belt)	sandy soils
<i>S.camphorosma</i> Iljin.	Plain and foothills	rocky slopes

It is clear from the table that most of the species belonging to the *Salsola* genus L. were distributed in the plain and foothill altitudinal zones. The soils where they were distributed are saline, saline gray, saline slopes and brown semi-desert soils. The rich xerophytic flora of the Nakhchivan Autonomous Republic has historically developed and formed in close genetic relationship with the floras of the Mediterranean, Near Asia and Iran. Based on the literature research and research work conducted, the following formation class of the genus *Salsola* L. exists in the Nakhchivan Autonomous Republic flora:

1. Shrubby-bushly and semi-shrubby saline desert formation class. The formation class includes *Halocnemeta*, *Salsoleta*, *Halostachyeta-Halocnemetum*, *Halostachyeta*, *Salsoleta-Halostachyetum*, *Kalidieta*, *Suaedeta*, *Halostachyeta-Kalidietum* and other formation groups.

2. Perennial salicornia-wormwood desert formation class. The formation class includes the formation groups *Salsoleta-Artemisiosum*, *Salsoleta-Suaedetum-Artemisiosum*, *Salsoleta-Artemisietum*, *SuaedetaSalsoletum-Artemisiosum*, *SuaedetaSalsoletum-Artemisiosum*, *Suaedeta-Artemisietum*, *Puccinellieta-Limonietum-Artemisiosum*, *Limonieta-Artemisietum*.

3. Ephemeral-salicornia desert formation class. The *Ephemereta-Salicornia-Petrosimoniosum* formation group, represented in the *Ephemeral-salicornia* desert formation class, includes the association *Ephemereta-Salicornia-Petrosimoniosum brachiata*.

4. Perennial-annual saline desert formation class. The formation class includes the formation groups *Salsoleta-Suaedetum-Epherosum*, *SalsoletaSalsoletum*, *Salsoleta-Petrosimonietum*, *Salsoleta-Petrosimonietum*, *Limonieta-Salsoletum-Petrosimoniosum*.

The *Salsoleta-Suaedetum-Epherosum* formation group is represented by the *Salsoleta dendroides-Suaedetum dendroides-Epherosum* association. The phytocenosis is edified by black locust and shrubby sedge. The association includes 17 species of higher plants. The total project cover reaches 25-45%.

The species included in the vegetation cover of the *Salsoleta-Salsoletum* formation group (a total of 523 species) mainly belong to the *Chenopodiaceae* Vent. family. The lowland has developed halophytic desert vegetation, with the edificators *Salsola dendroides* Pall., *Petrosimonia brachiata* (Pall.) Bunge, *European saltwort Salicornia europaea* L. and *Artemisia lerchiana* Web.

5. Wormwood-perennial saline desert formation class. The formation class is represented by the *Artemisieta-Salsoletum*, *Artemisieta-Suaedetum* and *Artemisieta-Camphorosmetum* formation groups.

6. Annual saline desert formation class. The formation class includes the *Petrosimonieta*, *Climacoptereta*, *Salicornieta*, *Eremopyreta-Petrosimonietum*, *Climacoptereta-Petrosimonietum*, *Salicornieta-Petrosimonietum*, *Petrosimonieta-Salicornietum* formation groups.

A study was conducted on the soil types and altitudinal zones where the genus is distributed. From the prepared table, it was clear that most of the species belonging to the genus *Salsola* L. of the family Terachichekli were distributed in the plain and foothill altitudinal zones. The soils where they are distributed are saline, saline gray, saline slopes and brown semi-desert soils.

The genus *Salsola* L. studied in the flora of the Nakhchivan Autonomous Republic belongs to the family *Chenopodiaceae* Vent. The family has 100 genera and 1600 species distributed in the world. 101 species of the family *Chenopodiaceae* Vent. are distributed in the flora of Azerbaijan. There are 30 genera and 76 species in the territory of the Nakhchivan Autonomous Republic. A systematic review of the genus was investigated and it was found that there are 13 species of the genus *Salsola* L., which belongs to the family *Chenopodiaceae* Vent., in the autonomous republic.

Species belonging to the genus *Salsola* L. are used in ornamental plants, medicine, chemical industry, and as food because they have significant feed value and none of them are poisonous. The quality percentage of meat of cattle and small-horned animals fed with it increases.

Species belonging to the genus *Salsola* L. participate in soil formation and reduce the salt content of the soil.

References:

1. Krasnaya kniga Azerbaidzhanskoi Respubliki. Redkie i ischezayushchie vidy rastenii i gribov (2013). Baku. (in Azerbaijani).
2. Gadzhiev, V. Ch., & Gasyмова, T. E. (2008). Slovar' flory Azerbaidzhana. Baku. (in Azerbaijani).
3. Askerov, A. M. (2011). Konspekt flory Kavkaza (s dopolneniyami i izmeneniyami, 1961-2009). Baku. (in Azerbaijani).
4. Askerov, A. M. (2008). Vysshie rasteniya Azerbaidzhana. Baku. (in Azerbaijani).
5. Grossgeim, A. A. (1936). Flora Azerbaidzhana. Baku. (in Azerbaijani).
6. Gurbanov E. M. (2009). Sistematika vysshikh rastenii. Baku. (in Azerbaijani).
7. Gumbatov, Z. I., & Alieva, I. F. (2015). Morfo-anatomicheskii analiz rasteniya *Salsola nodulosa* (Mog. Iljin). *Izvestiya AMEA*, 70(2), 140-143. (in Azerbaijani).
8. Mamedova, A. D. (1994). Tsenopulyatsii solyanok (*Salsola dendroides* Pall. i *Salsola nodulosa* (Mog.) Iljin) v pustynnykh fitotsenozakh Kobystana: avtoref. dis. ... kand. biol. nauk, Baku. (in Russian).
9. Ismailov, A. G., & Ibragimov, A. Sh. (2009). Endemichnye i reliktovye rasteniya basseina reki Gilanchai Ordubadskogo raiona Respubliki Azerbaidzhan. *Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki*, (1), 75-79. (in Russian).
10. Beideman, I. N. (1954). Metodika fenologicheskikh nablyudenii pri geobotanicheskikh issledovaniyakh. Moscow. (in Russian).
11. Beideman, I. N. (1979). Metodika izucheniya fenologii rastenii i rastitel'nykh soobshchestv. Novosibirsk. (in Russian).
12. Takhtadzhyan, A. L. (2003). Konspekt flory Kavkaza: v 3 t. Saint Petersburg. (in Russian).
13. Lapin, P. I. (1975). Metodika fenologicheskikh nablyudenii v botanicheskikh sadakh SSSR. Moscow. (in Russian).

14. Lavrenko, E. M., & Ponyatovskaya, V. M. (1967). Osnovnye voprosy izucheniya biologicheskoi produktivnosti nazemnykh rastenii i ikh soobshchestv. *Botanicheskii zhurnal*, 52(11), 1549-1562. (in Russian).
15. Babayeva, S. (2022). Contemporary Situation of the Rosaceae Family Tree Crops in the Nakhchivan Flora. *Bulletin of Science and Practice*, 8(12), 104-110. <https://doi.org/10.33619/2414-2948/85/13>
16. Babayeva, S. (2023). Phytocenological Characteristics of the Woody Species of the Rosaceae Family in the Steppe Vegetation of the Flora of Nakhchivan. *Bulletin of Science and Practice*, 9(5), 57-63. <https://doi.org/10.33619/2414-2948/90/06>
17. Babayeva, S. (2024). Special Protection of Nakhchivan Autonomous Republic Natural Areas. *Bulletin of Science and Practice*, 10(11), 81-88. <https://doi.org/10.33619/2414-2948/108/10>
18. Gambarov, D., İbrahimov, A., & Nabiyeva, F. (2011). Geographical areal types of Astragalus species spread in Nakhchivan Autonomous Republic. *Kafkas Üniversitesi Fen Bilimleri Enstitüsü Dergisi*, 4(1), 58-64.
19. Ganbarov, D., & Babayeva, S. (2020). Systematical Structure, Geographical Areal Classes and Ecological Groups of Rosa L. Genus Spreading in the Flora of Nakhchivan Autonomous Republic. *Bulletin of Science and Practice*, 6(6), 55-60. <https://doi.org/10.33619/2414-2948/55/07>
20. Mammadli, T., & Ganbarov, D. (2024). Study of Populations of Urtica dioica L. in the Mountain Areas of Nakhchivan Autonomous Republic. *Bulletin of Science and Practice*, 10(4), 53-58. <https://doi.org/10.33619/2414-2948/101/07>
21. Mammadli, T., Ganbarov, D., Babayeva, S. & Bayramov, B. (2024). Productivity of Spring-Autumn Pastures in Mountainous Areas in Nakhchivan. *Bulletin of Science and Practice*, 10(8), 153-160. <https://doi.org/10.33619/2414-2948/105/17>
22. Seyidov, M., Mammadli, T., Gasimov, H. & Bayramov, B. (2024). Flora of the Batabat Plateau. *Bulletin of Science and Practice*, 10(12), 62-70. (in Russian). <https://doi.org/10.33619/2414-2948/109/08>
23. Mammadli, T. (2025). Distribution, Chemical Composition and Nutritional Significance of Vicia elegans Guss. on the Elevated Plain Batabat. *Bulletin of Science and Practice*, 11(4), 26-33. <https://doi.org/10.33619/2414-2948/113/03>
24. Mammadli, T., & Bayramov, B. (2023). Feed Crops of Nakhchivan Arid Mountain Lands. *Bulletin of Science and Practice*, 9(11), 154-160. <https://doi.org/10.33619/2414-2948/96/21>
25. Mammadli, T., Babayeva, S., & Bayramov, B. (2024). Scientific Bases for the Use of Some Fodder Plants Disseminated in High Mountainous Areas in Nakhchivan. *Bulletin of Science and Practice*, 10(8), 108-114. <https://doi.org/10.33619/2414-2948/105/12>
26. Mammadli, T., Ganbarov, D., & Bayramov, B. (2024). Regularities of Distribution of Feed Plants in the Vegetation of Gunnut-Kapychik Physical-Geographical Region. *Bulletin of Science and Practice*, 10(6), 131-137. <https://doi.org/10.33619/2414-2948/103/19>
27. Huseynova, A. (2020). Bioecological Features of Some Species of the Salsola Genus Common in the Kur-Aras Lowland (Azerbaijan). *Znanstvena Misel*, (45-1), 15-17.
28. Gurbanov, E., & Asadova, K. (2020). Taxonomic Synopsis of Salsola Genus (Mil Plain, Azerbaijan). *Bulletin of Science and Practice*, 6(11), 78-84. <https://doi.org/10.33619/2414-2948/60/08>

Список литературы:

1. Azərbaycan Respublikasının Qırmızı Kitabı. Nadir və Nəslə Kəsilməkdə Olan Bitki və Göbələk Növləri. Bakı: Vostok-Zapad, 2013. 676 s.
2. Hacıyev V. Ç., Qasimova T. E. Azərbaycan Florasının Lüğəti. Bakı: Vyaz, 2008. 272 s.

3. Əsgərov A. M. Qafqaz Florasının Xülasəsi (əlavə və düzəlişlərlə, 1961-2009). Bakı. 2011. 200 s.
4. Əsgərov A. M. Azərbaycanın Ali Bitkiləri. Bakı: Vyaz, 2008. 240 s.
5. Гроссгейм А. А. Флора Азербайджана. Баку: Азернашр, 1936. 222 с.
6. Qurbanov E. M. Ali Bitkilərin Taksonomiyası. Bakı, 2009. 420 s.
7. Hübətov Z. İ., Əliyeva İ. F. *Salsola nodulosa* (Mog. Iljin) bitkisinin morfoloji və anatomik təhlili // AMEA Xəbərləri. 2015. C. 70. №2. Səh. 140-143.
8. Мамедова А. Д. Ценопопуляции солянок (*Salsola dendroides* Pall. и *Salsola nodulosa* (Mog.) Iljin) в пустынных фитоценозах Кобыстана: автореф. дис. ... канд. биол. наук, Баку, 1994.
9. Исмаилов А. Г., Ибрагимов А. Ш. Эндемичные и реликтовые растения бассейна реки Гиланчай Ордубадского района Республики Азербайджан // Известия ДГПУ. Естественные и точные науки. 2009. №1. С. 75-79.
10. Бейдеман И. Н. Методика фенологических наблюдений при геоботанических исследованиях. М.; Л.: Изд-во Акад. наук СССР, 1954. 131 с.
11. Бейдеман И. Н. Методика изучения фенологии растений и растительных сообществ. Новосибирск: Наука, 1979. 155 с.
12. Тахтаджян А. Л. Конспект флоры Кавказа: в 3 т. СПб.: Изд-во С.-Петербур. ун-та, 2003.
13. Лапин П. И. Методика фенологических наблюдений в ботанических садах СССР. М., 1975. 27 с.
14. Лавренко Е. М., Понятовская В. М. Основные вопросы изучения биологической продуктивности наземных растений и их сообществ // Ботанический журнал. 1967. Т. 52. №11. С. 1549-1562.
15. Babayeva S. Contemporary Situation of the Rosaceae Family Tree Crops in the Nakhchivan Flora // Бюллетень науки и практики. 2022. Т. 8. №12. С. 104-110. <https://doi.org/10.33619/2414-2948/85/13>
16. Babayeva S. Phytocenological Characteristics of the Woody Species of the Rosaceae Family in the Steppe Vegetation of the Flora of Nakhchivan // Бюллетень науки и практики. 2023. Т. 9. №5. С. 57-63. <https://doi.org/10.33619/2414-2948/90/06>
17. Babayeva S. Special Protection of Nakhchivan Autonomous Republic Natural Areas // Бюллетень науки и практики. 2024. Т. 10. №11. С. 81-88. <https://doi.org/10.33619/2414-2948/108/10>
18. Gambarov D., İbrahimov A., Nabiyeve F. Geographical areal types of *Astragalus* species spread in Nakhchivan Autonomous Republic // Kafkas Üniversitesi Fen Bilimleri Enstitüsü Dergisi. 2011. V. 4. №1. P. 58-64.
19. Ganbarov D., Babayeva S. Systematical Structure, Geographical Areal Classes and Ecological Groups of *Rosa* L. Genus Spreading in the Flora of Nakhchivan Autonomous Republic // Бюллетень науки и практики. 2020. Т. 6. №6. С. 55-60. <https://doi.org/10.33619/2414-2948/55/07>
20. Mammadli T., Ganbarov D. Study of Populations of *Urtica dioica* L. in the Mountain Areas of Nakhchivan Autonomous Republic // Бюллетень науки и практики. 2024. Т. 10. №4. С. 53-58. <https://doi.org/10.33619/2414-2948/101/07>
21. Mammadli T., Ganbarov D., Babayeva S., Bayramov B. Productivity of Spring-Autumn Pastures in Mountainous Areas in Nakhchivan // Бюллетень науки и практики. 2024. Т. 10. №8. С. 153-160. <https://doi.org/10.33619/2414-2948/105/17>

22. Seyidov M., Mammadli T., Gasimov H., Bayramov B. Flora of the Batabat Plateau // Бюллетень науки и практики. 2024. Т. 10. №12. С. 62-70. <https://doi.org/10.33619/2414-2948/109/08>
23. Mammadli T. Distribution, Chemical Composition and Nutritional Significance of *Vicia elegans* Guss. on the Elevated Plain Batabat // Бюллетень науки и практики. 2025. Т. 11. №4. С. 26-33. <https://doi.org/10.33619/2414-2948/113/03>
24. Mammadli T., Bayramov B. Feed Crops of Nakhchivan Arid Mountain Lands // Бюллетень науки и практики. 2023. Т. 9. №11. С. 154-160. <https://doi.org/10.33619/2414-2948/96/21>
25. Mammadli T., Babayeva S., Bayramov B. Scientific Bases for the Use of Some Fodder Plants Disseminated in High Mountainous Areas in Nakhchivan // Бюллетень науки и практики. 2024. Т. 10. №8. С. 108-114. <https://doi.org/10.33619/2414-2948/105/12>
26. Mammadli T., Ganbarov D., Bayramov B. Regularities of Distribution of Feed Plants in the Vegetation of Gunnut-Kapychik Physical-Geographical Region // Бюллетень науки и практики. 2024. Т. 10. №6. С. 131-137. <https://doi.org/10.33619/2414-2948/103/19>
27. Huseynova A. Bioecological Features of Some Species of the *Salsola* Genus Common in the Kur-Aras Lowland (Azerbaijan) // Znanstvena Misel. 2020. №45-1. P. 15-17.
28. Gurbanov E., Asadova K. Taxonomic Synopsis of *Salsola* Genus (Mil Plain, Azerbaijan) // Бюллетень науки и практики. 2020. Т. 6. №11. С. 78-84. <https://doi.org/10.33619/2414-2948/60/08>

Поступила в редакцию
30.10.2025 г.

Принята к публикации
09.11.2025 г.

Ссылка для цитирования:

Mammadli T., Alakbarova N., Mammadova Ja. Bioecological Features and use Directions of Species Belonging to the Genus *Salsola* L. Spreading in the Nakhchivan Autonomous Republic Flora // Бюллетень науки и практики. 2025. Т. 11. №12. С. 102-110. <https://doi.org/10.33619/2414-2948/121/13>

Cite as (APA):

Mammadli, T., Alakbarova, N., & Mammadova, Ja. (2025). Bioecological Features and use Directions of Species Belonging to the Genus *Salsola* L. Spreading in the Nakhchivan Autonomous Republic Flora. *Bulletin of Science and Practice*, 11(12), 102-110. <https://doi.org/10.33619/2414-2948/121/13>