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BIO-MORPHOLOGICAL FEATURES OF SALSOLA RICHTERI KAR IN CULTURAL CONDITIONS

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ABSTRACT

The article is devoted to the study of the bio-morphological features of the Richter's saltwort (salsola richteri kar.) in the conditions of culture. Good growth of cherkez on bare sands, high seed productivity, the ability to reproduce by seeds and cuttings and tolerate significant salinity, powerful growth of the root system contributed to its promotion as a promising plant when fixing the sands.

KEYWORDS: *Root System, Vertical Direction, Horizontal Direction, Seed Productivity, Ability To Reproduce By Seeds And Cuttings, Fodder Plant, Growth And Development, Experimental Plot, Lateral Roots, Branching, Aboveground And Underground Parts, Germination And Germination Of Seeds, Cotyledons, Flowering And Fruiting, Drought Resistance.*

INTRODUCTION

Richter's saltwort (local name: Akcherkez) belongs to the Marev family - Chenopodiaceae this species is an example of complex use in phytomeliorative practice. Good growth of Cherkez on bare sands, high seed productivity, the ability to multiply by seeds and cuttings and tolerate significant salinity, powerful growth of the root system contributed to its promotion as a promising plant when fixing sands [3]. Formation and long-term preservation of large organic matter with economical water consumption, the relatively high protein content characterizes Richter's hodgepodge as a valuable forage plant for the creation of autumn-winter pastures [2,4].

In addition, Richter's hodgepodge is included in the State Pharmacopoeia. Fruits and shoots contain alkaloid solsolidine and solsoline of Orekhov [2], which are used for hypertension and complex nervous diseases.

Based on the listed economically valuable properties of Richter's hodgepodge, scientists recommended its introduction into culture. Sokolov V.S., Petrov, Nechaeva, Prikhodko, Zaprometova [3], [4].

Despite the practical value of this species and the great attention on the part of researchers, the growth and development of Richter's saltwort, taking into account the influence of the environmental conditions of the Karakalpak part of the Kyzylkum desert.

MATERIAL AND METHODOLOGY

Richter's saltwort is one of the main food plants of The Kizil Kum. In our conditions, the culture of Richter's hodgepodge has been poorly studied. Therefore, we set ourselves the task of studying the dynamics of growth and development of the vegetative organs of Richter's hodgepodge, conducting phenological observations of the studied plants, and introducing it into culture.

The sowing soil was prepared by strip plowing. Sowing in the experimental plot was carried out in autumn and early spring.

The study of germination and germination of seeds in laboratory conditions was carried out according to the methodological instructions of MK Firsova [12], M.G. Nikolaeva and others [5]. The study of soil germination was carried out under the conditions of two experimental plots, depending on different sowing dates and the depth of seeding. Phenological observations of the rhythm and development of plants were carried out according to the method of I.N. Beideman [2]. The root system was studied using the trench method. Taranovskaya [2]. The flowering biology and seed productivity were investigated by the method of AN Ponomarev [7], IV Vainagy [6]. Morphological descriptions of vegetative and generative organs are made according to the methodology of IG Serebryakov [9], A.A. Fedorov and others [10], [11]. When studying ontogenesis, we used the scheme of age states proposed by T.A. Rabotnov [8], I.G. Serebyakov [9].

Study results

Laboratory germination. To determine the germination rate of Richter's saltwort seeds in laboratory conditions, we used seeds collected in the fall in 2015 from pure Cherkez, associations in the vicinity of the city of Nukus (near the bypass road on the sands). The experiments were carried out in Petri dishes, 100 seeds in triplicate at room temperature 18-23°C, seed germination exceeded by 30%. The absolute weight of Richter's hodgepodge seeds is 9, 25 gr.

Soil germination. With the autumn sowing of the collected seeds in 2015, the field germination rate was 16%, with the spring sowing 18%. Determination of soil germination of seeds is of great practical importance for determining their seeding rates, obtaining a certain number of seedlings per unit area. We studied the effect of storage time on the germination of Richter's hodgepodge seeds in February 2018 for various storage periods. With a long shelf life of Richter's

hodgepodge seeds, their germination rate decreases after 28 months of collection and was 9.6%, and after 16 months it was 11%, after 4 months it was 32.3% (Table-1).

TABLE 1 INFLUENCE OF SHELF LIFE ON LABORATORY GERMINATION OF RICHTER'S SALTWORT SEEDS

Place of collection	Array	Date of delivery of the experiment	Duration of storage period	Date of collection, year	Germination rate
North-western The Kizil Kum	Bypass road	2.02.2018.	28	2015	9,6
		2.02.2018.	16	2016	11,0
		2.02.2018.	4	2017	32,3

Seedlings appear in March, early April. There are frequent cases of seed germination in winter. Seedling cotyledons are linear-filamentous, juicy, light green, 20-30 mm long and 1 mm thick. Hypocotyls reach 50-60mm in length. A root that penetrates 30-40 mm deep into the soil, i.e. at this stage, the development of the aboveground part dominates over the root [2].

Cotyledons are characterized by a period of 1.5-2 months, they die off at the end of May. The height of the aboveground part of the Richter's saltwort plant (at the beginning of June) is 22 cm, the length of the main root is 15 cm, the length of the lateral roots is 3-5 cm. During this period, the plants have 5-6 shoots of the first order. At the end of July, the height of Richter's saltwort reaches 113 cm, the number of internodes is 120 (Table-2).

In our experiments, in Richter's saltwort, the flowering and fruiting phase was observed in the first years of life, the beginning of flowering in July, fruiting in mid-August.

TABLE 2 GROWTH DYNAMICS OF THE MAIN SHOOT OF RICHTER'S SALTWORT

Plant name	Observation dates						
	March	April	May	June	July	August	Sept.
Richter's saltwort	4 sm	7,3 sm	19 sm	43 sm	113 sm	143 sm	146 sm

At the end of the growing season, the plant height reached 146 cm (Table 2), the number of internodes on the main shoot was 120, the plant had shoots of I-III orders. The maximum shoot length is I-order 84 cm, on some specimens the number of fruits is up to 700 pieces [3] (table-3).

TABLE-3 SOME MORPHOLOGICAL INDICATORS OF THE VEGETATIVE ORGANS OF RICHTER'S SALTWORT AT THE END OF THE GROWING SEASON

Plant name	Number of I-order shoots	Length of shoots	Number of II-order shoots	Length of shoots	Number of internodes on the main shoot	Number of fruits
Richter's Saltwort	36	84	99	41	120	13-700

It should be noted that the emergence of seedlings in the studied species was observed earlier at high air temperature and atmospheric precipitation.

In the two-year-old Richter's saltwort, the regrowth of young shoots began in the first ten days of April, simultaneously from the lateral branches and from the main shoot. The appearance of leaves begins from the lower part of the main shoot, the number of leaves is 10, the length of the leaves is 6 cm, new shoots appear at the base of the dried shoots, they are shiny, reddish black, the trunk diameter is 1.7 cm, the bark is white. In the first decade of May, buds appear in the leaf axils in the upper part of the fourth order shoot. The number of buds in one generative shoot ranges from 6 to 14 pieces.

The results of studies on the study of flowering and fruiting of Richter's saltwort showed that in the Karakalpak part of the The Kizil Kum, under culture conditions, it begins to bear fruit in the first year of life. Richter's saltwort blooms simultaneously from the third decade of May-June to September. Mass flowering was noted from June 1-20.

Fruiting is highly dependent on the age of the bushes. According to N.S. Zapremetova [3], in the conditions of The Kizil Kum, Richter's saltwort bushes with a stock of seeds of up to 2 kg, on average, 200 grams, are rare. We, in the North-West of The Kizil Kum, under the conditions of culture of individual bushes of Richter's saltwort in the second year of life, gave 300-600 seeds.

The root system of the three-year-old Richter's saltwort on gray-brown soils and on sandy soils form numerous shoots of the first and second orders, and shoots of the third order are formed.

On gray-brown soil, the length of the roots reaches 130 cm, and on sandy soil, 152 cm. Their lateral roots reach 119-136 cm, the diameter of the main root is 1.2-1.7 cm, and the lateral roots are 0.6-1.2 cm. The number of lateral roots of the first order is 20-25 cm [3].

The concentration of the root system of Richter Saltwort in the soil layer, i.e. their penetration depth and volume depend on the age of the plant and on the type of soil.

The study of the dynamics of the underground part of Saltwort Richter shows i.e. gives the basis to consider that the formation of roots continues and there is no inhibition of growth in the fifth year of the growing season [3].

CONCLUSION

As a result, it was revealed that the underground part of the Richter Saltwort, deepening significantly in the first year of life, continues to develop intensively in subsequent years. Thanks to the powerfully developed root system, a large volume of soil is cooled and provides itself with moisture.

It should be noted that, under the conditions of culture, Richter's saltwort begins to grow in early April, bloom in June. In mid-September, lionfish appear on the fruits, in the second half of October the first ripe fruits appear, in early November they fully ripen, which means that this species develops normally, goes through the entire development cycle, self-seeding is annual, surviving without agrotechnical care.

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