ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 6| June 2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

UDC 633.88:581.5

BIOECOLOGICAL CHARACTERISTICS OF MILK THISTLE (SILYBUM MARIANUM L.) IN KARAKALPAKSTAN

Saitova Azima Kalzhanovna[1], Saitov Bainazar Kalzhanovich[2]
[1]Candidate of Biological Sciences, Associate Professor
[2]Assistant, Department of Agroecology and Introduction of Medicinal Plants
Berdakh Karakalpak State University, Republic of Uzbekistan

ABSTRACT

This article presents the results of a study of the bioecological characteristics of milk thistle (Silybum marianum L.) in the soil and climatic conditions of the Republic of Karakalpakstan. The characteristics of plant growth, development, and adaptation during the initial stages of ontogenesis were examined. It was found that milk thistle is highly resistant to the region's arid conditions and capable of successfully forming vegetative mass under optimal agricultural practices. The most intensive plant growth was observed in the second half of April and the first half of May. The obtained results demonstrate the potential of milk thistle cultivation as a valuable medicinal crop for providing the pharmaceutical industry with local plant materials.

KEY WORDS: *Milk Thistle, Silybum Marianum, Medicinal Plants, Introduction, Bioecology, Karakalpakstan, Phenology, Growth and Development.*

INTRODUCTION

Providing the pharmaceutical industry with high-quality plant-based raw materials is currently a pressing issue in modern healthcare and agriculture. According to global practice, a significant portion of medicinal products are produced using biologically active substances of plant origin. Milk thistle (*Silybum marianum L.)* occupies a special place among medicinal plants, being a valuable source of silymarin, a complex of flavonolignans with pronounced hepatoprotective properties.

In recent years, interest in milk thistle cultivation has increased significantly due to its high pharmacological value, ecological flexibility, and the ability to be grown in a variety of soil and climatic conditions. For the Republic of Karakalpakstan, characterized by an arid climate, moisture deficit, and high soil salinity, studying the adaptive capacity of medicinal plants and developing effective cultivation technologies is of particular importance. The aim of this study was to investigate the bioecological characteristics of milk thistle growth and development in Karakalpakstan and to assess its adaptive capacity during the early stages of ontogenesis.

MATERIALS AND METHODS

The research was conducted at the International Innovation Center for the Aral Sea Region under the Ministry of Ecology of the Republic of Uzbekistan. Crossroads were sown on March 16 in an area of 100 m2 after pre-sowing soil preparation. The width between rows was 90 cm, and the seed sowing depth was 2.5–3.0 cm.

To evaluate the influence of the water regime on plant growth and development, four experimental variants were established: the control without irrigation, the 5-fold irrigation variant, the 8-fold irrigation variant, and the 10-12-fold irrigation variant during the growing season.

During the study, phenological observations and biometric measurements of the plants were conducted. The plant's height, root diameter, and the number of leaves formed were determined. Observations were conducted at intervals of 5-7 days during the spring growing season.

RESULTS AND DISCUSSION

The conducted research showed high adaptability of the spotted rastropsha to the soil and climatic conditions of Karakalpakstan. Already in the early stages of development, plants exhibited active growth and the formation of vegetative organs.

At the initial observation stage, on March 20, the plant's height was 2.0 cm, the diameter of the root part was 0.8 mm, and the number of true leaves was 2. After five days, the plant's height increased to 3.0 cm, and its diameter reached 1.0 mm. In early April, further growth acceleration was noted: plant height reached 3.9–5.2 cm, and the number of leaves increased to 3–4.

The most intensive development was observed in the second half of April. By April 18, the plant's height was 10.0 cm, the diameter of the root part was 3.1 mm, and the number of leaves was 5. By the end of the month, the plants reached a height of 13.0 cm and formed 6 true leaves.

Growth processes continued in the first half of May. By May 6, the plant's height reached 13.9 cm, and by May 12, it reached 14.0 cm. The diameter of the root part increased to 5.5 mm, and the number of leaves reached 7. The obtained data indicate the favorable influence of spring temperature and agrotechnical measures on the formation of plant vegetative mass.

Analysis of the results revealed that the rastropsha possesses high ecological plasticity and successfully adapts to the region's arid conditions. It has been established that the most intensive growth occurs in April, when the air temperature rises

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 6| June 2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

and plants are provided with sufficient moisture. Timely execution of agrotechnical measures, including pre-sowing soil preparation and rational irrigation, plays a crucial role.

The results obtained align with the data of other researchers, who indicate the high drought resistance and adaptive capabilities of the rastropsha. Due to its developed root system and physiological characteristics, this species is capable of effectively utilizing limited water resources and maintaining high viability in arid climatic conditions.

CONCLUSION

Research results have demonstrated that the spotted rastropsha (Silybum marianum L.) successfully adapts to the soil and climatic conditions of Karakalpakstan and is characterized by high resistance to adverse environmental factors. The most intensive plant growth was observed in the second half of April and the first half of May, when the active formation of vegetative mass and an increase in leaf size occurred.

It has been established that adherence to the optimal irrigation regime and the timely execution of agrotechnical measures ensure favorable conditions for the growth and development of the crop. High ecological plasticity, medicinal value, and ability to adapt to arid conditions allow for the recommendation of speckled rastropsha for wide introduction into the agricultural production of Karakalpakstan. The culture is of significant interest to the pharmaceutical industry as a promising source of local medicinal plant raw materials.

REFERENCES

1. *Avdeeva E.V. "Theoretical and experimental foundations for using phenylpropoanoid-containing medicinal plants to obtain hepatoprotective and immunomodulating drugs": abstract of the Doctor of Pharmaceutical Sciences. – Tashkent, 2020. – 44 p.*
2. *Kurkin V.A. "Quantitative Determination of the Sum of Flavonoids and Flavolygnans in Silybum marianum (L.) // Plant Resources. – 1996. – Vol. 32, Issue 3.*
3. *Pospelov V.S. "Pumpkin Rastoropsha: Issues of Biology, Cultivation, and Application." - Poltava: Poltava Agricultural Academy Publishing House, 2008. – 164 p.*
4. *Rosykhin D.V. "Pharmacognostic study to substantiate the comprehensive use of pumpkin rhubarb" // Bulletin of the Volga Region Postgraduate School. - Tashkent. - No. 5-6 (2). – P. 342–346.*