

**BIOECOLOGICAL CHARACTERISTICS OF MEDICINAL DANDELION
(TARAXACUM OFFICINALE (L.) WEBER EX F.H. WIGG) IN THE FERGANA
VALLEY**

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Abstract: This article provides a comprehensive description of the bioecological characteristics of the medicinal plant *Taraxacum officinale* (L.) Weber ex F.H. Wigg in the Fergana Valley. It highlights the species' natural distribution, its level of adaptation to environmental factors, and its phenological phases.

Keywords: ecological factors, population, agroecosystems, biologically active substances, phenological phases, polymorphic species, apomictic forms, antibacterial, antioxidant, polysaccharides, immunomodulator, large-scale plantations.

Introduction

The significance of this study lies in the fact that medicinal plants have long been used as the most effective natural remedies by humanity. In the modern era, the exploration of their survival strategies, responses to various ecological factors, and the synthesis of biologically active compounds represent a key direction in bioecological research.

Global climate change, increasing anthropogenic pressures, and the intensification of agrotechnical practices have led to the decline of many medicinal plant populations. This, in turn, affects their bioecological characteristics significantly.

A review of the literature reveals that while there is extensive information on the medicinal and therapeutic properties of *Taraxacum officinale* [1,2,3], studies focusing on its bioecological characteristics and its significance as an ecological and natural resource remain limited [4,5].

Materials and Methods

The object of this research is the perennial herbaceous plant *Taraxacum officinale* (L.) Weber ex F.H. Wigg. Its bioecology was studied through field observations and analysis of phenological stages, using the method proposed by I.N. Beydeman [6].

Results and Discussion

Taraxacum officinale is a polymorphic species with apomictic forms. Some researchers even

consider these forms as separate species. In Uzbekistan, the species is found in almost all regions except high mountain and desert zones. It commonly grows in disturbed plant communities, grassy soils, especially near residential areas, fields, abandoned lands, along roadsides, irrigation channels, erosion-prone slopes, and sometimes in forests and shrublands [7].

In the Fergana Valley, *Taraxacum officinale* demonstrates high adaptability even in saline, marshy, and partially rocky areas, as well as on the edges of irrigated cotton fields. Observations conducted by the Botanical Garden of the Academy of Sciences of Uzbekistan in 2021 showed that this plant thrives in soils with pH levels ranging from 7.2 to 8.1 [4].

The content of biologically active substances in *Taraxacum officinale* samples grown in the Fergana Valley was found to be 1.4 times higher than those from Andijan district. This indicates that microclimatic factors such as temperature and humidity significantly influence the synthesis of secondary metabolites [5].

The vegetation period of the species in the Fergana Valley begins in late March and lasts until the first decade of October. The plant undergoes four main phenophases: vegetative growth, budding, flowering, and seed formation. The highest accumulation of flavonoids occurs within ten days after the flowering phase.

In the Fergana Valley, dense populations of *Taraxacum officinale* are predominantly found in areas near water sources in Besharik, Rishton, Kokand, and the outskirts of Fergana city. Moderate humidity during spring and summer in these regions creates optimal growing conditions. Especially in iron- and calcium-rich soils, the flavonoid content increases, enhancing the plant's medicinal value.

Some studies also consider *Taraxacum officinale* as a stabilizing element in agroecosystems. However, when its density exceeds a certain threshold, it can negatively impact the growth of crops such as cotton, alfalfa, and vegetables.

This species is a bioactive plant widely used in folk medicine. Its chemical composition—including tannins, polysaccharides, vitamins, and essential oils—serves as a source of various biological activities. Modern medical studies have confirmed its anti-inflammatory, antibacterial, antioxidant, hemostatic, and immunomodulatory properties. In autumn, the roots of *Taraxacum officinale* are especially rich in inulin [3]. The plant's roots are included in stomach and diuretic herbal mixtures, and its concentrated extracts are used in tablet formulation.

Conclusion

In conclusion, *Taraxacum officinale* is well adapted to the ecological conditions of Besharik and Kuva districts in the Fergana Valley, especially thriving in sunny and dry areas. Samples collected from urban and suburban areas contain relatively lower levels of medicinal compounds. Therefore, organizing special plantations in the foothill zones of the Fergana Valley for raw material collection represents a promising direction.

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