



PHENOLOGY OF PHLOMOIDES ANISOCHILA AND PHLOMOIDES SOGDIANA

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ABSTRACT

Phenology, the study of seasonal patterns in plant life cycles, plays a crucial role in understanding the ecological dynamics of plant species and their interactions with the environment. In this study, we investigate the phenology of two closely related species, *Phlomoides anisochila* and *Phlomoides sogdiana*, native to Central Asia. Through field observations and experimental data collection, we explore the timing of key phenological events such as flowering, leaf emergence, and senescence, as well as the environmental factors influencing these patterns. Our findings shed light on the adaptive strategies of these species to the unique climatic conditions of their habitat and provide valuable insights into their ecological significance and conservation.

KEYWORDS: Phenology, *Phlomoides anisochila*, *Phlomoides sogdiana*, Central Asia, Climate Change, Conservation.

INTRODUCTION

The study of plant phenology is very important scientific information. Based on this knowledge, it is possible to use plants effectively, to study their biological properties, and to have accurate information on the origin of plants. In addition, it has been noted by many scientists that the phenology of plants should be fully studied in the purposeful use of plants. There is very little information on the phenology of species of the genus *Phlomoides* Moench. Phenological studies on *Ph. anisochila* and *Ph. sogdiana* were not conducted in our facility. Our research is aimed at studying the phenology of *Phlomoides anisochila* and *Phlomoides sogdiana* and identifying the difference between them. *Ph. anisochila* was included in the 2019 edition of the Red Book of the Republic of Uzbekistan as a status 2, "Rare" species. Rare species are species that are preserved only in certain small areas under specific conditions, but may disappear quickly and require serious control [1]. In order to study the phenology of these plant species, observations were made during the years (2020-2022) in different senopopulations of *Ph. anisochila* and *Ph. sogdiana* distributed in nature in the Nurota State Reserve. These are characterized by the following: the resting period of plants, the beginning of vegetation, the formation of leaves and the formation of buds, flowering and the formation of fruits, the formation, ripening and spreading of seeds, and the end of vegetation.

Phenological observations were carried out mainly using the method of I.N. Beideman [2], characteristic of hemecryptophyte plants. First of all, plant bushes characteristic of the generative period were selected and observations were made on them. Species of the genus *Phlomoides* are characteristic of the ephemeroïd type in the Nurora mountain range. Some scientists have noted this. Phenological observations revealed that the phenology of *Ph. sogdiana* starts earlier than that of *Ph. anisochila*, which was revealed in our field experiments.

The phenology of *Ph. sogdiana* coincides with the end of February and the beginning of March, and is determined by the arrival of good weather. Some years it was observed in the second decade of March. *Ph. anisochila* was observed in the second and third decade. First, it begins with the development of the caudex and the bulging of the leaves on the surface of the soil. In April, it is characterized by the full formation of leaves and vertical pulling of branches. In the second and third decade of April, the arrangement and formation of buds in leaf axils was observed. The opening of the first flowers at the end of the third decade of April *Ph.* observed in *Sogdiana*. Budding and flowering is a very complex biological and physiological process, and there are a number of factors affecting it. As mentioned above, the opening of *Ph. anisochila* is late compared to *Ph. sogdiana* and, based on 3-year observations, it mainly corresponds to the first and second decade of May. According to the Red Book of Uzbekistan, *Ph. anisochila* is given as June-July. But this information is T.A. Odilov. and A.I.Vvdensky's herbariums collected during 1960-1980. However, during the months of June-July 2019-2023, the vegetation of these plants in this area will be almost complete, and the surface of the earth will be frozen.

Observations revealed that the duration of the process in *Ph. sogdiana* was 15-20 days, and in *Ph. anisochila* it was 16-21 days. Studies have shown that both species differ not only morphologically, but also biologically and physiologically. The process of formation of seeds occurs from the completion of the flowering process. This time coincided with the end of May and the beginning of June in *Ph. anisochila*. And in *Ph. sogdiana*, it coincided with the second and third decade of May. In both species, the ripening of the seeds took a short time, and the seeds ripened in 30-35 days. During the ripening of the seeds, the color of the branches slowly changes from green to yellow, and the chlorophyll grains in the leaves die and change color. After the seeds are fully ripe, the above-ground part of the plant dries up. It was the third decade of June and the beginning of July. The end of vegetation in July was almost the same in all three years. In general, *Ph. anisochila* and *Ph. sogdiana* phenology includes a short period of time.

In short, it takes 150-155 days from the beginning to the end of *Ph. sogdiana* vegetation. The interval from the beginning of vegetation to flowering was 60-65 days. The beginning and end of the flowering process was 15-20 days. *Ph. anisochila* takes 155-160 days from the beginning to the end of its vegetation. The interval from the beginning of vegetation to entering the gulag was 60-65 days. The beginning and end of the flowering process was 14-17 days. How climatic conditions occur throughout the year greatly affects the phenology of *Ph. anisochila* and *Ph. sogdiana*.

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