ISSN NO: 2771-8840
Date of Publication: 10-06-2023

Some Morpho-Biological Characteristics Of A. Albidium And A.Tenifolium Populations

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Annotation. This article provides information on the signs of adaptation to environmental conditions in the formation of leaves of the plant species Acanthophyllum albidum Schischk, A. tenuifolium Schischk.

Key words: plant, ontogeny, saponin, environment, cotyledon, leaf, cultivar, hill, mountain.

Introduction

Among the natural plants of the Republic of Uzbekistan and other neighboring republics, species of thistle family are of great interest among botanists and pharmacologists (except Alloshrusa species, which were previously included in this family, but later separated into a separate family), because the saponins (glycosides) obtained from these plants are used in textiles, perfumery, widely used in confectionery, pharmaceutical industry, non-ferrous metallurgy and other industries.

The demand for saponins is met by using the natural reserves of these plants. However, as a result of long years of irrational exploitation, cattle grazing, exploitation of hills and other human activities, the natural reserves of most species with high saponin levels have decreased. As a result, reserves used on an industrial scale were lost. For example, Acanthophyllum albidum Schischk, A. tenuifolium Schischk, which is widespread in the Fergana Valley and is one of the most important species. its range has been extremely reduced (A. tenuifolium is distributed only in 15-20 square meters on the left bank of the Khonguli canal in Mayli-say's place called Koy-kulak, it is not found anywhere else; A. albidum is found in a few places in the hills of Fergana region - in very small areas, and therefore was included in the "Red Book of Uzbekistan" (2019). Therefore, comprehensive study of saponinous plants in order to increase saponin raw materials, determining their areas and reserves is one of the urgent problems of botany, because in addition to the preparation of unlimited raw materials in the primary genetic centers of these species, humans can also affect the surrounding environment. Intrusion has direct and indirect negative effects, as a result of which changes in the structure of some species or group of species may occur and valuable genetic resources may be destroyed or lost.

Another problem is the lack of consensus among systematists about the independence of A. pungens and A. albidum from the species we studied. For example: B.K. Shishkin, (1936), M. Musaeva, Q. Zakirov (1987), J. Tursunov (1988), T.A. Madumarov (2005) recognize these two species as independent species. However, A.I. Vvedensky (1953), who knew Central Asian flora perfectly, classified A. pungens and A. albidum as one species-A. albidum and believes that it is widespread throughout Central Asia; O.M. Bondarenko (1971) includes A. albidum in A. pungens and writes that this species is found in all places of Central Asia except Pamir. A. tenuifolium is considered by A.I. Vvedensky to be very close to A. albidum.

In view of the above-mentioned points, we found it necessary to compare the anatomical and morphological structure of the three named species in ontogeny in order to determine their proximity or distance from each other and their adaptive features. In this work, for the first time, the main attention was focused on the classification of the morphobiological structure of grass blades and leaves. In addition, plants taken from points of the A. albidum species area distributed in the valley with different environmental

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conditions were studied in their ontogeny. Two species in the Fergana Valley -A. albidum, A. tenuifolium-geographical distribution was given importance. The results obtained from it are of great importance in elucidating some questions of the adaptation of these species to external environmental factors in their geographical distribution, as well as evolution and systematics. Because there is almost no information on the structure of juvenile and definitive leaves, that is, the anatomical and morphological structure of the series of leaves, the comparative anatomical and morphological structure of the organs of forms (populations) taken from places with different ecological conditions during the area of one species, so we consider these plants We tried to determine the characteristics of morpho-biological signs depending on the adaptation of leaf series to the environment in different environmental conditions.

Materials and methods

The main material for A. albidum and A. tenuifolium were the plants and their herbarium specimens obtained from the following different points of the Fergana Valley (young shoots, grass, annuals and perennials fixed in 60-700 alcohol in April-May and October-November) :

Using preparations from plant organs, tissue cell sizes were measured using an ocular-micrometer (MOV-1.5x). A transverse section was prepared from the middle part of the seeds, the structure of the spermoderm tissue was studied and the thickness was measured. The thickness of seed cotyledons in the cross section, the height of adaxial and abaxial epidermal cells, the number and length (thickness) of the layers of clouded and columnar cells were determined. The number, structure, epidermal cells, number and size of mouthparts of leaf organ hairs per 1 mm^2 S.F. According to the method of Zakharevich (1954), the anatomical indicators of the mesophyll P.A. It was studied in cross-sections according to the method of Baranov (1925). The mathematical analysis of the data was analyzed based on the methods of G.N. Zaitsev (1984, 1990).

Results and discussion

Depending on the point of geographical distribution, the 1st growths of stilts are observed in February-April: in the Mindon-Chimyon mountains from the end of February to the beginning of March, in the Chust-Pop mountains from the end of March to the beginning of April (1-15). In Suluk-ota (Kurama Mountain) - at the end of April*, in Iordon (Khurjun Mountain) - at the beginning of March, and A. tenifolium (in Koy-kulak, Mayli-say) - at the end of April. Palla leaves are oblong inverted ovate, 4-6 mm long, 2-3 mm wide; the number of juvenile leaves is on average 10 pairs, the length increases from the bottom to the top, and the width decreases, the bracts are very sparse with short trichomes, and the juvenile leaves are relatively densely hairy. At the beginning of May, grass without leaves (at this time the leaves dry up) has 3-4 pairs of juvenile leaves, 5-8 mm long and 0.4-0.6 mm wide, depending on the growing area.

At the end of the first year of vegetation, the length of the plants is 4-8 cm, brachyblasts (small leaves) are formed in their 2-3-4 joints from the top down; 1 pair of second-order branches are formed from the first-order (main) branch of some grass growing in the porous gravelly, relatively humid areas of the hilly lowlands, and 3-4 third-order branches are formed from its tip; these continue to grow next year during the vegetation period and form 4-5-jointed third-order (E.Yu. Ruzmatov, T.A. Madumarov, 2006) vegetative branches with a length of 1-1.5 cm. in the third year's vegetation, fourth-order branches are formed from the top of the branches, and the tip of them is completed with a flower head.

Most of the plants of the first year consist of a main (mother) branch without side branches, which has 10-12 joints. It decreases from -7 mm to 1 mm. This pattern is observed in both leaves and brachyblasts. The length of the leaf increases from 1.5 to 2.5 cm from the first to the fifth joint, and decreases from 2.5 to 2 cm from the 5th to the 11th joint.

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In the second year of the plant's vegetation, 4-6 secondary branches with a length of 5-10 cm and 10-18 joints are formed. In some plants, the main branch is branched, and a branch of the 1st degree is formed.

During the third year of vegetation, the number of second-order branches in most plants increases by almost 0.5-2 times due to the branches formed from the buds of the lower and middle parts of the first-order branches. Thus, if in the first year their number was 3-4, then at the end of the third year's vegetation there will be 6-8.

8-12 branches of the third order are formed on the branches of the secondary order, their length is 2-7 cm, 5-12 joints.

The number of branches of the fourth order is 15-20, the length is 10-20 cm, it has 5-12 joints, the length of the joint interval is from 0.5 cm to -2.5 cm.

At the tip of some of the third-order branches, short (1.5-2 cm) fourth-order branches with 3-4 joints are formed in the axils of the leaves.

Branches of the third order are formed mainly in the third year, and those of the 4-5th order are formed in the 4th-5th year and are finished with three-pointed flowers.

Conclusions

The analysis of the data obtained on the branching of the population of the A.albidium species allows us to conclude as follows.

Young lawns formed during the first year of vegetation, regardless of the geographical distribution of the species population and the formation of brachyblasts (1-2) or not, will have a height of 4-8 cm; in relatively favorable natural conditions, i.e., in the lower pore gravel areas of the hills with relative humidity, 40-45% of the populations of this species, regardless of where the species grows, go to the generative phase in the third year, and the remaining 55-60% in the fourth year. This is the law A. also belongs to the species tenuifolium. This is the norm for almost all species populations.

It is interesting to note that some plants (about 1%) of the Khurjun mountain population have entered the generative phase in the second year. This phenomenon is probably the result of the influence of external environmental factors.

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