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Study of Seed Germination of Common Chicory (Cichorium Intybus L.)

Batirova Laziza
Gulistan State University, Associate Professor of Biology Republic of Uzbekistan
Xidirkulov Eler
2nd year graduate Gulistan State University

Abstract: *This articleыdiscusses the description, application, chemical composition of the plant, andthe study of seed germination of common Chicory (Cichorium Intybus L.).*

Keywords: *phytopreparation, chemical composition, Asteraceae, perennial, baskets, linear leaves, propagates, seeds.*

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Currently, the search for new types of medicinal plants in order to expand the range of domestic herbal medicines remains a relevant area of modern pharmacy. The study of the chemical composition of both organic and inorganic substances is a necessary step in justifying the pharmacological action of medicines in the process of their development. фитопрепаратовPlants of the chicory genus (Cichorium) are considered to be promising objects for the development of phytopreparations Cichorium. The most common species, both in cultivated and wild form, is chicory vulgaris. Common chicory (Cichorium intybus L.) belongs tothe Asteraceaefamily. it is widely known as a food plant, the dried and roasted roots of which are used as a coffee substitute. For these purposes, chicory is cultivated for a two-year period, after which the roots are processed, and the aboveground part is a waste product. However, studies of the chemical composition and pharmacological activity confirm the feasibility of using chicory grass as a medicinal plant raw material. In its wild form, chicory grows as a weed near roads, ditches, vacant lots, along river banks, among shrubs, in fields, along the edges of forest edges, near settlements and in the mountains up to the middle mountain belt. According to the literature, chicory grass contains flavonoids, phenol carboxylic acids, oxycoumarins, triterpenes, vitamins, trace elements (manganese and iron). Anthocyanins have been identified in the flowers. Since the pharmacological effect of medicinal plant raw materials is due not only to organic, but also to inorganic substances, as well as to exclude the effect of toxicity, it is advisable to study the composition of micro-and macronutrients of chicory grass. The object of the study was wild chicory grass harvested during the flowering phase in the Syrdarya region.

The object of the present work is Cichorium intybus L., widely known as Cichorium intybus. It is a widespread and best-known species from the genus Cichorium L., belonging to the Asteraceaefamily, class Dicotyledoneae (Takhtadjyan, 1966; Cherepanov, 1991). The genus includes about 10 species of perennial and biennial grasses, some of which are introduced to culture (Flora of the USSR, 1964). A double set of chromosomes is 18 (Mehra et al., 1965; Chromosomal

numbers..., 1969). Cichorium intybus L. is a perennial taproot polycarpicwith a Holarctic range. The species is native -to the Mediterranean. Currently, it is distributed in all European countries, in the Caucasus, in the Crimea, and is listed in Western Siberia, Central Asia, and North America.

The height of adult wild individuals can reach 160-180 cm, the length of the main root is 180 cm or more. In width, the root system is spread out for several tens of cm. Generative shoots are semi-rosette orthotropic, mono -, di- and polycyclic, green or blue-green hairless, covered with coarse hairs. There are two types of leaves — basal and stem. Rosette leaves - from string-pinnately divided to whole, toothed along the edge, with winged petioles; stem-lanceolate, stem-embracing, covered with short hairs. Flowers are collected in numerous baskets, which are arranged in bundles in the axils of the upper and middle stem leaves, only one basket is placed on the tops of the shoots. The basket wrapper is double-row, glandular-pubescent. The inner leaves are linear, obtuse; the outer leaves are ovate-lanceolate, sharp, covered with cilia along the edge. The flower is flat with bristly films.

All flowers are ligulate, the corolla is blue in different shades, very rarely whitish, with a short tube and a five-pronged bend up to 1.5 cm long. The length of the corolla can be twice as long as the wrapper. The basket consists of 1117 flowers.

In natural conditions, Cichorium intybus is propagated almost exclusively by seeds. One plant forms up to 25,000 seeds (Dobrokhotov, 1961). Achenes up to 3 mm long, light brown or brown. All the organs of seedlings and adult plants contain milky sap (Gubanov et al., 1976).

Wild chicory was used as a medicinal plant as early as in ayurvedic medicine in India (Rucher and, Noldenn, 1991). Official medicine of the last century recommended decoctions of chicory root and "grass" for dyspepsia, belching, and scorbut (Bosse, 1940). Currently, the use of chicory vulgaris for medicinal purposes is wide and diverse. Traditional medicine and homeopathic practice recommend using decoctions, infusions and extracts from roots to increase appetite and enhance digestion (Gubanov et al., 1976), as well as for cirrhosis of the liver, jaundice, anemia, spleen tumors, malaria, scurvy (Nikolaeva, 1977, 1978, 1981). Chicory is used in the treatment of diabetes and gout.

Experiments using alcohol extracts and chicory infusions have shown (Karaevand Aliev, 1958) that the use of these drugs increases the body's tolerance to carbohydrates.

Cichoriumintybus (Demyanenko, 1979) two preparations from the er part were proposed: "Tikosyn" - for the treatment of liver and liver diseases.

"Focin" — as a photosensitizing agent. The flowers contain chicory glucoside, so the infusion of inflorescences can be used as a means of calming the central nervous system and enhancing the activity of the heart. Chicory decoction has an antimicrobial, strengthening and astringent effect, ash is used for leishmaniasis (Grodzinsinka-Zachwieja, 1962; Burlage, 1956; Stepanov and Lukyanuk, 1971).

Chicory leaves contain a large amount of vitamin C and B vitamins (riboflavin, thiamine, nicotinic acid, etc.). Cichorium intybus is cultivated. In culture, it develops as a biennial plant, forming a thickened root crop at the end of the first growing season. Root vegetables are mainly used to make a coffee substitute and to produce alcohol and sweet syrups. The roots of wild chicory with a moisture content of 72.2% (from absolute dry matter) contain: ash-5.7%, protein-14.8%, inulin-48.9%, fructose-4.7% (Larin et al., 1956). Pectin substances (Eisenberg, 1940), sesquiterpene lactones, flavonoids, coumarins, and polyacetylene compounds (Rucher and, Noldenn, 1991) were also obtained from the roots.

Common chicory is one of the best honey plants (Loszert, 1958; Akhmetov and Lavrukhin, 1981). The honey productivity per hectare of wild chicory can be estimated at 100 kg (Davidovich and

Davydova, 1947). The flowers secrete nectar in wet weather and even during rain. The nectar is blue in color, but due to mixing with the nectars of other plant species, it does not affect the shade of honey.

On pastures and in the form of green top dressing, common chicory is well eaten by the main types of farm animals; it increases the milk yield and nutritional value of cows (Dmitriev, 1941; Gubanov et al., 1976; Akhmedov and Lavrukhin, 1981). Wild chicory readily available sika deer, marmots, ground squirrels, and voles are used for food (Larin et AL., 1956). Cichorium intybus is a mesophyte. It occurs sporadically from desert-steppe to wet-meadow communities (stages 21-83 of the Ramenskoye scale), but it is abundant only on drained soils of dry-and fresh-meadow communities (stages 57-60 of the Ramenskoye scale). It also depends on the variability of moisture content: in crops with variable water regime, it is not abundant enough, the number of individuals increases at moderate and moderate temperatures. under constant humidification conditions (Ramenskiy et al., 1956). Tolerates minor flooding and siltation. Chicory vulgaris is a light-loving plant that grows in open, well-lit spaces. However, as with other meadow plants (Bylova, 1974; 1995;), its seedlings and juvenile plants are more shade-tolerant and grow in dense grass stands with significant shading. Adults that are part of highly thickened grass stands (95-100% projective cover) have strongly elongated non-branching shoots and lighter color of stems and leaves.

The wide range of the species indicates that chicory vulgaris can tolerate significant temperature fluctuations, including autumn and spring frosts. The growing season begins in the first half of April and ends with the establishment of sub-zero temperatures and the formation of snow cover. Cichorium intybus occurs at pHa soil pH of 5.0 to 9.1, but is most abundant when the reaction of the soil is close to neutral (pH 7.0-7.5) on thick, ordinary and southern chernozems and weakly leached soils of floodplain and lowland meadows of the forest-steppe and steppe zones. Moderately (0.3-2.5 of the projective cover) chicory is found in dry meadows of the forest zone on soils with poor water and mineral nutrition. Fluctuation in the soil reaction affects the abundance of chicory, although a single species grows as acidic on sandy and sandy loam leached soils, as well as on salt marshes (Ramenskiy et al., 1956).

Common chicory tolerates moderate grazing well (Larin et al., 1956), but in the conditions of specific communities, the influence of grazing can either not manifest itself at all, or lead to semi-slaughter.

Cichorium intybus is a component of the upper tiers of ruderal and secondary mixed herb communities. It grows mostly in dry drained areas near housing, along roads, on slopes, vacant lots, on construction sites, in dry meadows and steppes (Bosse, 1940; Larin et al., 1956; Maltsev, 1962; Wegwarte, 1992). Common chicory does not act as a dominant or subdominant in indigenous natural phytocenoses, 1 as it belongs to the explerent species and has a g-strateshu; it prevails in disturbed phytocenoses, often being an indicator of the degree of anthropogenic impact or at the early stages of primary successions. Among the herbaceous vegetation type, a number of authors (Grigorevskaya, 1971; Sakhanov, 1988; Solomakha, 1989) distinguish the tsikorev formation, which can be represented by several associations. Depending on the habitat, different plant species can grow with chicory vulgaris.

When the phytocenosis is transformed in the direction of stability, common chicory does not tolerate competition, falling out of the herbage either completely, or remaining in the form of a few cenopopulations. The presence of a large number of chicory individuals in the plant community indicates a permanent anthropogenic impact on the phytocenosis. Therefore, we can expect that in the entire range of ecologicaland phytocenotic habitat conditions, the species will be represented by a number of ecological and coenotic populations that differ in morphological features, individual development rates, and living standards.

The study of the features of seed renewal, the biology of seed germination and the seed stock in the soil revealed some characteristic patterns. Indicators of seed productivity of an individual and coenopopulation are closely related to similar indicators of vitality. The greatest number of ovules and seeds is formed in powerful individuals with a large number of well-developed generative organs. Seed productivity and seed yield vary significantly depending on the type of plant community that includes the coenopopulation, as the thickness of individuals varies dramatically depending on phytocenotic conditions. The highest yield was recorded in the typical habitat conditions of the species: ruderal and disturbed communities, the initial stages of primary successions, etc.

The reproductive capacity of chicory vulgaris changes significantly in ontogenesis. Most of the seeds are produced by g2 individuals; a decrease in the number of seeds in gi individuals occurs due to the formation of a small number of generative shoots, and in g3 individuals - due to a decrease in the productivity of the shoot. Meteorological conditions during the entire period of plant development affect the nature of chicory productivity. Favorable conditions in the autumn, winter and early spring periods contribute to the formation of a larger number of generative shoots, in the spring period -the formation of a larger number of inflorescences, in the summer period - intensive pollination, in раннеосеннийthe early autumn period -the maturation of a larger number of viable seeds.

Study of seed germination of Chicory vulgaris (CICHORIUM INTYBUS L.)

Study of seed germination of common Chicory (CICHORIUM INTYBUS L.)				
19,05,2022	In diss waters	of 0.1% Na Cl (30 seeds)	0.2% NaCl (30 seeds)	0.3% li NaCl (30 seeds)
(received 30 seeds obtained)				
21,05,2022	20%	3,33%	0	0
22,05,2022	33,33%	10%	0	0
23,05,2022	53,33%	16,67%	3,33%	0
24,05,2022	70%	43,33%	6,67	0
25,05,2022	70%	46,67%	6,67	0
26,05,2022	70%	53,34%	6,67	0

The highest indicators of laboratory germination and germination energy were observed in seeds after a one-year shelf life with periodic freezing. When chicory seeds are sown in the field and in the meadow, there are differences in the germination rate and seed germination rhythms. The absence of competitive interactions and agrotechnical tillage contributes to an increase in seed germination. Over time, the influence of external and internal factors on the mechanism of seed germination increases.

Most of the viable seeds are located at a depth of 0-4 cm. Germination of seeds from deeper layers occurs when the surface layer of the soil is disturbed. Experiments on seed germination from different depths have shown that seeds located in the soil deeper than 6 cm do not germinate.

A comprehensive ecologicaland phytocenotic analysis of the structure ценопопуляций of Cichorium intybus coenopopulations shows that the same parameters of different coenopopulations are dynamic, which is determined by the intensity of exogenous and endogenous factors and the ability of coenopopulation elements to respond differentially depending on the degree of impact.

The age structure ценопопуляцийof common chicory coenopopulations is an integrated expression of the biological properties of the species. According to the type of life strategy, the species is defined by us as a fluctuating explerent, so the concept of a base spectrum is not applicable to it. Cenopopulations of Cichorium intybuslocated in similar ecological and phytocenotic conditions are

characterized by a similar age structure and similar indicators of the number and density of individuals. In our opinion, it is necessary to distinguish certain types of the age spectrum that are characteristic of a specific range of conditions in which the coenopopulationis located.

The age spectra of coenopopulations are adaptive, change markedly depending on environmental conditions and anthropogenic impact, and reflect the fluctuating nature of dynamic processes in phytocenoses.

The study of the vital structure of cenopopulations was carried out stepwise. At the initial stage, based on the size differentiation of individuals of different age states, an eight-point vitality scale was compiled, which allows not only to determine the vitality of an individual at the time of observation, but also to distinguish the levels of vitality of ontogenesis. In the future, the scale is used to assess the viability of cenopopulations in various geographical, ecological and phytocenotic conditions.

It was found that individuals of common chicory of the same age state can differ in the degree of development of vegetative and generative organs both in coenopopulationsgrowing in different ecologicaland phytocenotic conditions, and within the same coenopopulation. многобалловойThe generative fraction of chicory vulgaris is the most variable part of the multi-point vitality scale due to the longer life of individuals in this period and differences in the structure of vegetative and generative organs of plants of different age states.

The viability ценопопуляций of Cichorium intybus coenopopulations is primarily determined by the phytocenotic role of the species as a component of plant communities; the quantitative ratio of individuals of different levels of development is significantly affected by the growing conditions. The rate of coenopopulation development may vary depending on the environmental conditions, thickness, and age status of individuals.

Summarizing studies of the spatial structure of cenopopulations, we should first of all highlight their heterogeneity. As the main structure-forming factors influencing the spatial distribution of individuals, it seems that some features of chicory biology should be singled out: the absence of vegetative reproduction in natural conditions, the explerent type of life strategy, high seed productivity and a long duration of the generative period of ontogenesis.

In conclusion, it should be noted that rod polycarpics are currently one of the least studied in the population-ontogenetic aspect биоморфof plant biomorphs. The author will consider his task completed if the work serves to expand the understanding of the ecological and biological featuresof the explerent species, the variability of the structure and dynamics of its coenopopulations depending on the type of phytocenosis, the level of urbanization, and the degree of recreational digression. Of course, the species, which is ubiquitous in cities and villages, on vacant lots, pastures and meadows, is not yet fully used by humans. In the future, the role of common chicory as a source of medicinal and food raw materials and an object of population monitoring will certainly increase.

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