



# **ANDIJAN STATE UNIVERSITY**

**MATERIALS OF THE 1<sup>ST</sup> INTERNATIONAL  
CONFERENCE:**

## **CONSERVATION OF EURASIAN BIODIVERSITY: CONTEMPORARY PROBLEMS, SOLUTIONS AND PERSPECTIVES PART I**

**CONFERENCE PARTNERS:**

**Ege University, Tukiye &  
Baku State University, Azerbaijan**

**15-17 MAY, 2023**

**ANDIJAN STATE UNIVERSITY  
ANDIJAN, UZBEKISTAN**



1<sup>st</sup> international conference: Conservation of Eurasian biodiversity: contemporary problems, solutions and perspectives. Part II. 15-17 may, 2023, Andijan State University, Andijan, Uzbekistan. 2023. – 224 p.

ISBN: 978-9943-9165-3-1

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# GROWTH AND DEVELOPMENT OF *SALVIA OFFICINALIS* L. DURING PERIODS AND STAGES OF ONTOGENESIS IN THE CONDITIONS INTRODUCTION

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*The article presents the results of studying the period and stages of ontogeny of the species *Salvia officinalis*, introduced in the conditions of the Karshi oasis. Studies have established that *S. officinalis* has completely passed the periods and stages of ontogeny. It has been established that the seeds have a short dormant period, and the germination rate of seeds under laboratory conditions is 92%. It was found that the herbal stage lasts 8-10 days, the juvenile stage lasts 10-15 days, the immature stage lasts 70-74 days, the adult virginal stage lasts 130-135 days. In the first year of life, plants that completed their vegetation at virginal age overwintered in the open air. It entered the generative period from the second year of vegetation and the generative period lasted 60-70 days. The senile period was not observed in *S. officinalis* species during the years of research.*

**Key words:** ontogenesis, latent, virginal, generative, vegetation.

Introductions. We all know that it is scientifically important to protect, multiply, cultivate and scientifically use plants that are valuable to the national economy. Therefore, in recent years in our country, much attention has been paid to the organization of arable land of medicinal species, which is an effective source of medicines.

*Salvia officinalis* L. – medicinal sage is one of the most valuable medicinal species, which has long been used in medicine. Due to the accumulation of a large amount of essential oils in the leaves, flowers and young twigs (up to 1-2,5% on the leaves, from 0,32% to 0,40% of the aerial green part and flowering branches), the plant is included in teas used for inflammation throat, chest, upper respiratory tract, stomach ailments and diarrhea. It is used in medicine as a disinfectant, astringent, anti-inflammatory agent (Байкова, 2006; Кудряшев, 1936; Мурдахаев, 1990; Usmonova and Nasriddinova, 2021).

The object of our research is insufficiently studied bioecological properties of sage under conditions of introduction. E.V. Baikova (2006) studied the introduction and bioecological characteristics of a number of species belonging to the genus *Salvia* in the conditions of Novosibirsk. Yu.M. Murdakhaev (1990) in the laboratory of medicinal plants of the Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan partially studied the phenology and yield of sage, among other introduced species.

*S.officinalis* was first introduced to the Karshi oasis from seedlings grown in the Tashkent Botanical Garden. In 2016, seeds were grown under these conditions (Nasriddinova and Yaziyev, 2019) and the stages of ontogenesis were studied.

The study of the individual development of introduced species in ontogeny is of great importance, and the adaptive characteristics of introduced species to new conditions are manifested at the early stages of plant ontogenesis. Consequently, the study of the stages of ontogeny of *S.officinalis* makes it possible to think about the further growth and development of the species (Серебряков, 1952; Nasriddinova and Yaziyev, 2021).

Research methods. Experiments to study the biomorphological properties of *S.officinalis* at the stages of ontogenesis were carried out on 10 plants. The results were analyzed statistically (Зайцев, 1984.).

The life cycle of *S.officinalis* introduced in the Karshi oasis was studied on the basis of generally accepted criteria (Работнов, 1960; Серебряков, 1952) and was divided into the following periods and stages: latent (*se* – seeds), virginal (*p* – seedlings, *j* – juvenile, *im* – immature, *v* – virginal), generative (*g* – generative phase).

Research results. The latent period is dormant stage of seeds. Seed germination of *S.of-*

*ficinalis* was studied in the Karshi oasis. The seed of the species *S. officinalis* is a dark brown, smooth, oblong, round nut. Their length is 2,74-2,76 mm, width 2,18-2,22 mm. The weight of 1000 seeds is 7,21-7,43 g. Seeds have a short dormant period, but remain viable for 7-8 years. Seed fertility 92 % after 1-2 years, 83 % after 3 years, 69 % after 4 years. In subsequent years, their fertility decreases and after 7-8 years is 14 % (Figure 1).

Initially, seed germination was studied in laboratory conditions. Seeds of the selected species were collected from plants grown in the Karshi oasis.

The seeds were planted in a Petri dish at different temperatures from 100 pieces in 3 repetitions, and it was found that the optimum temperature for seed germination was 21-22 °C. At this temperature, the germination rate was 92 %. In other variants, seed germination was significantly lower. Seeds began to germinate in 3-4 days (Tab. 1). From the micropilaria of germinated seeds, first a root grew, then yellowish-green cotyledons.

**Table (1):** Indicators of seed germination in conditions laboratory

Plant name	Air temperature, °C	The length of the seeds, days	Productivity, %
<i>Salvia officinalis</i>	16-17	5-13	65
	21-22	3-8	92
	24-25	2-5	75

The virginal period is divided into 4 stages: seedlings, juvenile, immature, virginal.

The *seedling stage* is the stage from seed germination to complete germination of the cotyledon and the formation of the initial stem. Seeds sown outdoors on March 10, 2014 began to germinate after 8 days. Hypocotyls are light pink,  $8,6 \pm 0,4$  mm long. The seed coat protrudes from the ground along with the cotyledons. The seedling consists of two green leaves and a root system. The single-day cotyledons are  $3,5 \pm 0,2$  mm long and  $2,8 \pm 0,2$  mm wide. The main root is 2,5-3 cm long, and the first lateral root begins to form. From the day the seeds germinate, the formed roots grow rapidly and help the seedlings firmly adhere to the soil, providing it with moisture. The seedling stage lasted 8-10 days in the life of the plants.

*Juvenile stage* – a week-old sage plant reaches a height of  $2 \pm 0,1$  cm and a real leaf is formed on the plant. The main root is 4-4,5 cm long and forms 3-4 lateral roots. When the cotyledonous plate reaches 7 mm in width, 5,5 mm in length and 5 mm in petiole, it stops growing, and the first pair of leaves appears, which are from the apical buds. The juvenile stage includes 20-25 days of plant life.

*Immature stage* – 20-day-old plant reaches a height of  $9,9 \pm 0,2$  cm and has 5 pairs of leaves. Initially, from the first and shortly after the second segment, branches of the second order begin to form, and the plant enters the immature stage. By this time, the main root reaches 10-11 cm in length, secondary lateral roots begin to develop.

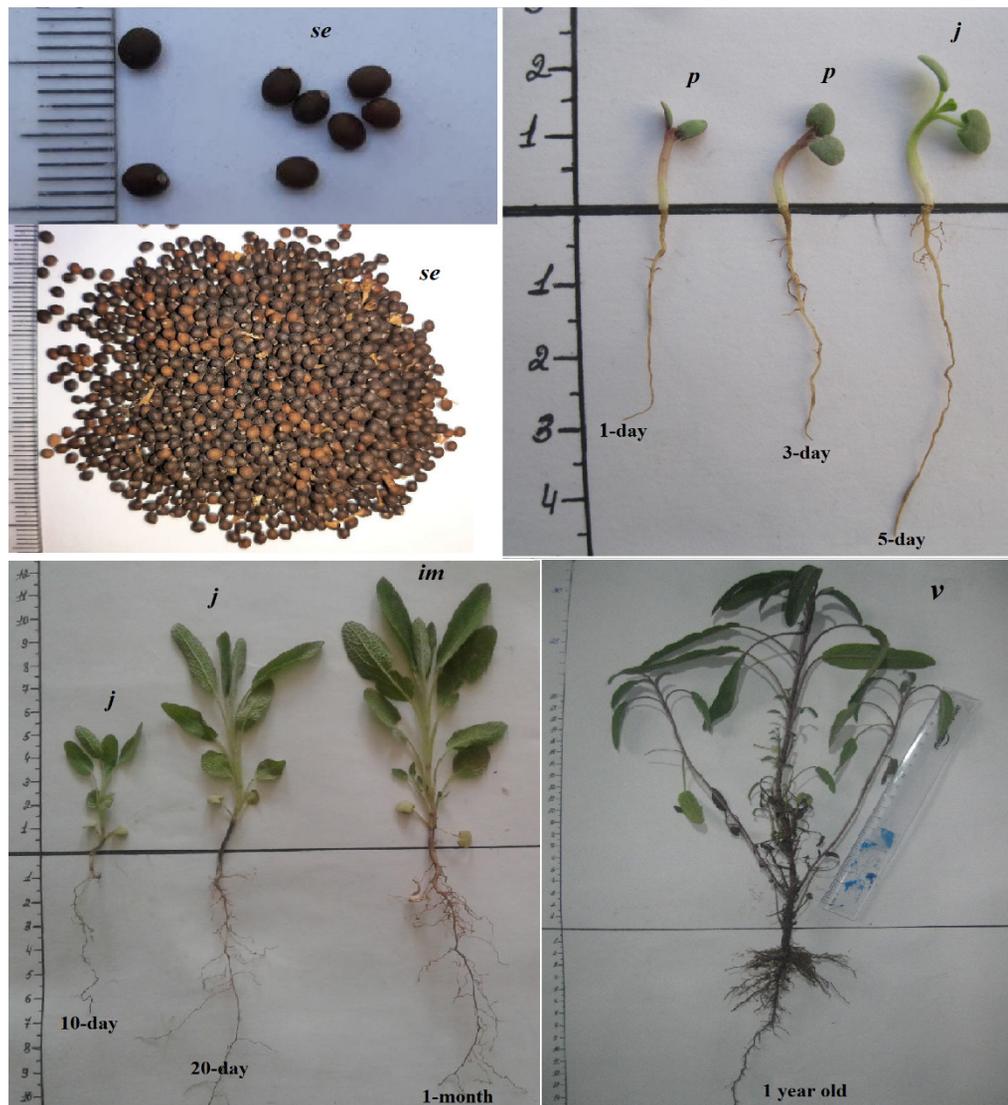
When the plant is one month old, its height is  $11,4 \pm 0,3$  cm. On the main stem there are 5 pairs of leaves ranging in size from 1,5x1,2 cm to 5x15, cm, on the branches of the first order, formed in the first and second segments, there are 2 pairs of leaves each. By this time, the root of the plant branches to the second order, the diameter of the main root thickens to 0,4 mm. The life span of the cotyledon is 35-40 days, the maximum size is  $7,1 \pm 0,25$  mm in length and  $6,2 \pm 0,2$  mm in width. Immature stage 70-74 days.

The height of a 3-month-old plant is  $17,8 \pm 0,4$  cm, the growth of the main branch slows down. The number of first-order branches reaches 6 pairs. The shoots pass through the third order of branching and the plant enters the adult virginal stage.

By this time, the extrathermic (extremely hot) period begins in the Karshi oasis, and under its influence the plant stops its growth. After the second half of August, the plants begin to grow again. In 6-month-old plants, growth of the main and first branch order accelerates in mid-September. During this period, their height reaches  $18,6 \pm 0,4$  cm.

In the autumn months, plant growth accelerates. At the same time, plants continue to grow until December, that is, until the first frost. At this time, the height of adult virgin seedlings is

33,1±1,03 cm, the number of branches of the second order is 11-12 pairs, and the number of branches of the third order is 6-8 pairs. Thus, the adult virginile stage was 130-135 days. In the first year of life, he completed the growing season in the virginal period (Figure 1).



**Figure (1):** Stages of the ontogenetic period in the first year life of *S.officinalis*: se – seeds, p – seedling, j – juvenile, im – immature, v – virginile.

Virginilous age *S.officinalis* overwintered in the open field. There are no cases of cold damage in them.

The climate of the Karshi oasis is favorable for plants, and thanks to the warm winter, *S.officinalis* begins its vegetation in early spring (mid-February).

The generative period – is the period from budding to fruit ripening, the plant goes into the generative phase from the second year of the growing season. In plants that start growing in early spring, in early April, inflorescences are formed at the top of the main stem and at the tops of the first-order branches. Biennial plants give up to 8-10 inflorescences, three-year-old plants - up to 150-200 inflorescences (Nasriddinova and Yaziyev, 2019).

According to the results of our research, the phases of plant budding are observed in late March - early April, flowering - in April-May, fruiting - from the third decade of April to the first decade of June. In April and May, buds, flowers and fruits were simultaneously formed on the same plant. Generative period 60-70 days. The flowers are determined to be the type of plant that opens during the day. The results of our observations of the phenology of flowering are presented in table 2.

**Table (2): Phenology of flowering *S.officinalis* in the conditions of the Karshi oasis, (n=10)**

Observed years	Budding	Flowering period			
		beginning of flowering	mass flowering	end of flowering	duration, (days)
2015	03.04	13.04	21.04–19.05	04.06	52
2016	27.03	05.04	18.04–20.05	02.06	58
2017	29.03	08.04	17.04–22.05	06.06	59

The senile period was not observed in *S. officinalis* species under the conditions of the Karshi oasis. According to the literature, it is noted that the natural vegetation of the plant lasts 10-15 years.

In conclusion, sage grew well in the new environment. Plants grown outdoors go through all stages of ontogenesis. Plants that completed their vegetation at virginal age in the first year of life overwintered in the open field, and from the second year of vegetation, transitions to the generative phase were observed. It is determined that flowering occurs in April-May and the generative period was 60–70 days.

#### References:

1. Байкова Е.В. 2006. Род шалфей: морфология, эволюция, перспективы интродукции. Новосибирск: Наука, 248 стр.
2. Зайцев Г.Н. 1984. Математическая статистика в экспериментальной ботанике. Москва: Наука, 424 стр.
3. Кудряшев С.Н. 1936. Эфирно-масличные растения и их культура в Средней Азии. Ташкент, стр. 195-198.
4. Мурдахаев Ю. 1990. Ўзбекистонда ватан топган ўсимликлар. Тошкент, 74-76 б.
5. Nasriddinova M.R., Yaziyev L.Kh. 2019. Growth and development of *Salvia officinalis* L. under the oasis of Karshi. European Sciences review, 3–4. 6–8.
6. Nasriddinova M.R., Yaziyev L.Kh. 2021. Biology flowering *Thymus vulgaris* L. in the conditions oasis of Karshi. Annals of the Romanian Society for Cell Biology, Vol. 25, Issue 4. 7596-7602.
7. Работнов Т.А. 1960. Методы изучения семенного размножения травянистых растений в сообществах. Полевая геоботаника. В 5-и т. Т. 1. Москва-Ленинград, стр. 20-40.
8. Серебряков И.Г. 1952. Морфология вегетативных органов высших растений. Москва: Советская наука, 391 стр.
9. Usmonova Sh.Sh., Nasriddinova M.R. 2021. Seed productivity of species in the genus *Salvia* L. under the conditions of Karshi oasis. The 6th International scientific and practical conference "World science: problems, prospects and innovation", 140-144.

## **MAYA GÖBƏLƏYİ HÜCEYRƏLƏRİNƏ ULTRABƏNÖVŞƏYİ-C ŞÜALARININ TƏSİRİ ZAMANI OKSİGENİN FƏAL FORMALARININ MİQDARININ KORREKSIYASI**

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*The purpose of the presented work is to investigate the interaction between the change in the amount of active forms of oxygen (OFF) and the viability of cells after the action of ultraviolet-C (UV-C) rays on yeast cells. It was determined that UV-C rays cause an increase the amount of OFF in the Candida guilliermondii yeast cells. The increase in the amount of OFF as a result of their in-*

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