CHARACTERISTICS OF ONTOGENESIS OF INTRODUCTION HUPERICUM PERFORATUM L.

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Abstract.The rapid growth of the world's population increases the demand for medicinal plants and raw materials for them. Growing medicinal plants in artificial conditions allows them to conserve their natural resources. In recent years, the study of the morphobiological properties of medicinal plants in artificial conditions has highlighted the need to develop a technology for growing and preparing raw materials. In this regard, it is relevant to study promising medicinal plants in relation to the climatic conditions of a particular region, develop recommendations on the technology of growing raw materials for the pharmaceutical industry.

Keywords: ontogenesis, latent (seed), virginil (grass, juvenile, immature and adult vegetative stage), generative (young, middle and old), senile.

Introduction

No. PP-2911 of the President of the Republic of Uzbekistan dated April 20, 2017 "On measures to create favorable conditions for the accelerated development of the pharmaceutical industry of the republic", No. PP-4670 dated April 10, 2020 "On the protection of wild medicinal plants, the Resolution on culture No. PQ- 4901 of November 26, 2020 "On measures to expand the volume of scientific research on the cultivation and processing of medicinal plants, the development of their seed production"[6,7,10,11,12]

The soil and climatic conditions of our country are in all respects favorable for the growth of medicinal plants. One of these promising plants is the perforated deciduous field (Hypericum perforatum).

Materials and methods

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Plant ontogeny T.A. Rabotnov. (1960) O.V. Smirnov (1997) [1; 2]. The morphobiological properties of the plant in ontogeny were studied[†] using 10 model plant clusters. T.A. Rabotnov divides ontogeny into 4 periods of 10 growth stages. Their classification is based on L.A. Jukov [3;]. I - latent (seed), II - virginal (grass, juvenile, immature and adult vegetative stage), III - generative (young, middle and old), IV - senile. The study of the ontogeny of H. perforatum was based on the above classification.

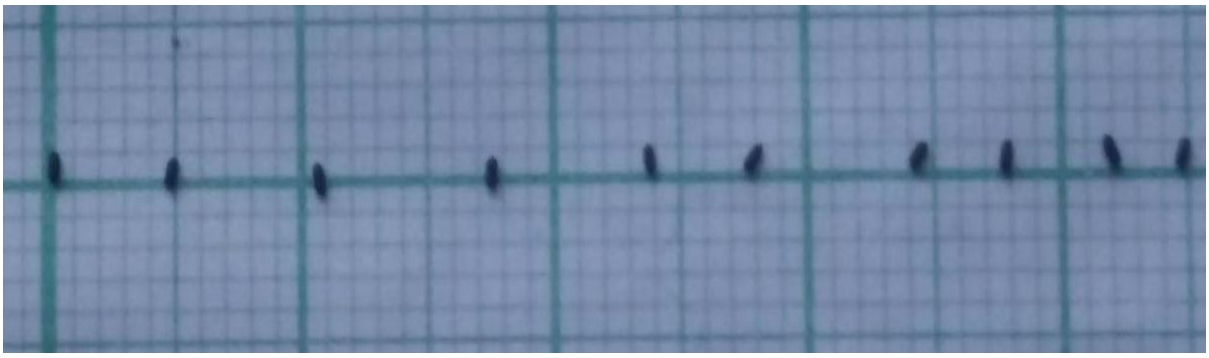

***Figure-1. Hypericum perforatum* seeds.**

Results and Discussion

Virginian period (V). Grass Stage (P). Full germination of field seeds was observed on March 15, 2017 when sown in the field in October. Seed germination begins with the appearance of the main root. When this root reaches a depth of 2-3 cm, the hypocotyl seed brings the leaves to the surface. Seed leaves 2 are fleshy, oblong-ovate, smooth green, 0.2 cm long, 0.1 cm wide. The hypocotyl is clearly visible, its length is 0,2 cm. The elongated branch is an epicotyl 0,1–0,2 cm long .The growth cone begins to rise, and the grasses of the first true leaves appear at its base, which begin to grow slowly.

The first pair of chin leaves is slightly ovoid, ovate, glabrous (without hairs), 0,3 cm in size and 0,2 cm in width. They are located opposite each other on the first stalk.

Juvenile phase (j). At this stage, the plant reaches a height of 0,5 cm and the seeds are preserved. Each plant produced an average of 4 pairs of leaves. They were slightly

[††]

larger than the first leaves of the chin, which were 0,3 cm long and 0,2 cm wide. The main root, which has 3-5 lateral roots, is located at a depth of 3 cm.In the second decade of April, the length of the plant stem increases to 4-5 cm, the length of the leaves opposite the stem - up to 0,6-0,7 cm, width - up to 0, 4-0,5 cm. At this stage, as the plant stem grew, the number of leaves and their size increased, and in the first decade of May the plant had a stem length of 10-12 cm, a leaf size of 0,9 cm and a width. 0,6 cm. The root is 8-10 cm long, has 7-8 lateral roots.

***Figure-2. Hypericum perforatum*leaf formation.**

Immature phase (im). In contrast to the washing stage, the immature stage began to form lateral branches in the leaf axils at the bottom of the stem, together with an increase in the number of leaves, the leaves became 1,1 cm long and 0,7 cm wide. Gradually, the plant began to branch out. On the main stem, up to 7-8 lateral branches are formed, the length of which is 0,3 cm, the length of the leaves is 0,2 cm and the width is 0,1 cm (Fig. 1-2). In the first ten days of June, the height of the main stem reached 30 cm, the number of lateral branches - 12, length - 4-6 cm. As the

branching of plants rose from the bottom up in the leaf axils, the length of the branches decreased, and the distance between the joints became shorter.

The length of the lateral branches at the bottom of the stem ranged from 17,4 to 22,1 cm, and the length of the branches at the top was 4-5 cm.The number of lateral branches was 30,1, the length of lateral branches was 17,4 cm, the number of leaves was 30,3, the width of the leaves was 0,8 cm, leaf height 1,3 cm, to a depth of 3 cm - 15,5 cm, up to 1,5-2 mm wide. The root is light orange. At this stage, the process of rhizome formation begins.

Figure-3. Ontogenesis stages*Hypericum perforatum*.

Adult vegetative stage. At this stage, the height of the field plant reaches 45,3 – 46,7 cm. The leaves and twigs formed on the plant begin to grow. However, the formation of generative organs has not yet been observed. Branched branches are formed, they are 1,5 cm long and 0,8 cm wide. Opposite leaves have formed on the stem. In the axils of the leaves, lateral branches 17,3 cm long were also formed. In

the underground part, a rhizome with a diameter of 0,3–0,4 cm was developed. A well-branched arrow root was observed at a depth of 25,7–30,4 cm.

The juvenile, immature and adult vegetative stages differ from each other in the length of the stem and leaves, the formation of branches in the axils of the leaves and the achievement of lateral branches of a certain size.

Generative period (d). The generative period is divided into three stages: young generative, middle generative, and old generative. In the generative period of ontogeny, the steppe plant begins from June 8-10.

Young generative stage. This stage is characterized by the appearance of buds on the plant. The bud length increased to 1,1 mm (June 8-10) and 13 mm on June 16-17. It has been studied that the budding period for one plant is 10 days.

Generative stage in middle age. The beginning of this phase fell on the flowering period of the steppe on July 15, 2017. According to our observations, the flowering of the steppe began on July 15, and by July 25, the general flowering period began. In the leaf axils, generative branches were formed first in the second order, and then in the third order. As a result, a branched stem was formed on the branch. It turned out that the inflorescences contain more than 50-150 buds and flowers.

During the period of mass flowering, on one bush of the plant, an average of 4,9-5,7 generative branches were observed, 40,3-50,0 flowers in each generative branch. The shape and size of the leaves on the stem are the same as those of a young generative plant. The main root and rhizome are woody. Dried leaves are preserved on the generative stem. The root system reaches a maximum size of 35,7-40,9 cm.

Generative stage of aging. Fruit ripening began on July 20-24, and full ripening coincided with the period from August 20 to September 1. It was observed that from 48 to 80 seeds were formed in one pod.

The morphological features of the fruit and the seeds contained in it in plant ontogeny are important not only from the point of view of taxonomy, morphology, but also from the point of view of their economic significance.

Seed morphology has hardly been studied in our context. According to the results of our study, our observations in the field of studying the morphological characteristics of steppe seeds were carried out on October 15, 2016 in sowing options with different sowing methods (Table 1). Determined the length, width, germination, germination in laboratory conditions and the weight of 1000 seeds.

From the data in the table, it is known that the size of the sowing material of the field, that is, the length and width of the sowing 30x15 cm, is 1,0 mm, and the width is 0,4 mm, the sowing method is 45x15 cm and 60x15 cm – 1,1; 1,3 mm and a width of 0,5 mm.

When sowing 30x15 cm and 45x15 cm, the weight of 1000 seeds was 0,11 g, and when sowing 60x15 cm – 0,12 g. Germination in field conditions was 90,3%, the general process of germination was observed after 139-140 days. Under laboratory conditions, germination after 10-14 days was 82,7%.

When the length of the steppe plant reaches 45-48 cm, it forms 5-6 generative stems and 15-20 secondary vegetative stems. The number, shape and size of leaves on the stem are preserved both in a young generative plant and in a middle-aged generative plant. The rhizome changes color and becomes light brown. May contain traces of dried leaves and generative stems. The main root is mostly woody. In the 2nd or 3rd order, most of the lateral roots are destroyed[5,8,9,10,11,12].

Table 1.

***Morphological features of the genus H. Performatum*2017-2019 y. (n=10)**

Landing conditions	Mass of a thousand seeds gr	Seed cell (mm)		Germination % day	
		Length	Width	In field conditions flourish	Unicity in laboratory conditions
30x15	0,11 ±0,07	1,0±0,05	0,4±0,05	90,3% 135-140	82,7% 10-14
45x15	0,11 ±0,06	1,1±0,05	0,5±0,05	90,3 135-140	
60x15	0,12±0,08	1,3±0,05	0,5±0,05	90,3 135-139	

Table 2.

Duration of the stages of ontogenesis H. performatum

№	Ontogenesis of periods	Duration in a year (day)
I	**Latent period**	14-16
II	**Virginil period**	80-82
	Lawn stage yuvenil stage immatur stage adult vegetative stage	9-10 44 17-18 10
III	**Generative period**	55-60
	young generative middle generative old generative	18-20 10-12 27-28
IV	**Senile period**	-

Conclusion

The complete transition of the virginal and generative cycles and stages in the ontogeny of Huperisum perforatum is described in detail, while the juvenile, immature and adult vegetative phases differed from each other in the length of the stem and leaf, the formation of branches in the leaf axils and lateral horns. reaching a certain size.

Refrerences

1. Роботнов Т.А. Методы определения возраста и длительности жизни у травянистых растений // полевая геоботаника. М; Л., 1960. Т. 2. 500. с.
2. Смирнова О.В. Онтогенетический атлас лекарственнқх растений. Учебное пособие - Йошкар-Ола, МарГУ, 1997, 240с.

3. Жукова Л.А. Популяционная жизнь луговых растений. Йошкар- Ола: МарГУ, 1995.224 с.

4.Begmatova M., O'ralova S. Subject: some biological characteristics of cherry (huperisumperforatum l) planted in different crop schemes //Theoretical aspects in the formation of pedagogical sciences. – 2023. – Т. 2. – №. 6. – С. 51-58.

5. Mustanov, S. B., Begmatova, M., &Berdimurodov, D. X. (2022). Pharmaceutic properties and season characteristics of development hypericumperforatum. European International Journal of Multidisciplinary Research and Management Studies, 2(12), 112-116.

6. Khamrayeva M., Begmatova M. Growing from seeds in the field cheledoniummajus l //American Journal of Pedagogical and Educational Research. – 2022. – Т. 6. – С. 51-53.

7. Khamrayeva, M., &Begmatova, M. (2022). Healing properties and biometrical indicators of chelidoniummajus l., introduced in uzbekistan.

8. БегматоваМ. Х., УроқовА. У. Лекарственныесвойстваифитохимическийсоставусловиях hypericum perforatumинтродукции //Eurasian Journal of Academic Research. – 2021. – Т. 1. – №. 9. – С. 177-182.

9. Хамдамов И., Бегматова М. Х., Сувонова Г. А. Морфо-биологические особенности некоторых лекарственных растений //Современные технологии: актуальные вопросы, достижения и инновации. – 2017. – с. 57-60.

10. Botirov, A., & Arakawa, O. (2021). Root growth changes in the winter planting of young 'MiyabiFuji'apple trees. International Journal of Horticultural Science and Technology, 8(3), 227-233.

11. Botirov, A., An, S., Arakawa, O., & Zhang, S. (2022). Application of a visible/near-infrared spectrometer in identifying flower and non-flower buds on 'Fuji'apple trees. Indian Journal of Agricultural Research, 56(2), 214-219.

12. Botirov, A., & Arakawa, O. (2022). The interaction of rootstocks, water and soil humectants and young apple tree growth. Academic research in educational sciences, 3(Speical Issue 1), 43-56.