

MORPHOBIOLOGY OF SOME PLANTS WITH RHIZOMES

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Abstract: this article reveals the growth, formation of additional roots of rhizomes of introductory plants - *Menyanthes trifoliata*, *Acorus calamus* and *Iris pseudacorus*.

Keywords: rhizome, *Menyanthes trifoliata*, *Acorus calamus* and *Iris pseudacorus*, hypogeogenic, epigeogenic.

МОРФОЛОГИЯ НЕКОТОРЫХ РАСТЕНИЙ С КОРНЕВИЩЕМ

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Аннотация: эта статья рассматривает рост, образование дополнительных корневищ интродуцированных растений - *Menyanthes trifoliata*, *Acorus calamus* и *Iris pseudacorus*.

Ключевые слова: корневище, *Menyanthes trifoliata*, *Acorus calamus* и *Iris pseudacorus*, гипогенный, эпигенный.

A lot of decorative, healing plants were and are being introduced in Uzbekistan [1], [2], [5]. *Menyanthes trifoliata*, *Acorus calamus* and *Iris pseudacorus* can be included into the list of such plants. These introductions are plants with rhizomes, which have specific biological features.

Rhizome is perennial subterranean organ that gathers reserve substances and that has the ability to rehabilitate. Rhizomes differ from each other by their length, thickness, the growth and viability of their additional roots.

E. Warming [7], [8] uses the name "geokorm" for subterranean stems, and divides them into plagiogeokorm and orthogeokorm rhizomes relying on their features. Plagiogeokorm rhizomes are very thick and short and *Iris pseudacorus*, *Acorus calamus* are the examples of them. Al.A. Fedorov, M.E. Kirpichnikov, Z.T. Artyushenko give information about monopodial and sympodial branching [6]. *Menyanthes trifoliata*, *Acorus calamus* and *Iris pseudacorus* rhizomes make sympodial branchings during the growth, *Iris pseudacorus* and *Acorus calamus* rhizomes have their joint spacing short and thick, while *Menyanthes trifoliata* rhizomes differs by being long and thick.

The two ways of formation of plant rhizomes are explained by several examples in scientific works of I.G. Serebryakov, T.I. Serebryakova [4]. Plants have an epigeogenic or hypogeogenic rhizome depending on the process of rhizome formation. Hypogeogenic rhizomes are "primary plagiogeokormic" rhizomes, and the rhizome, which is an subterranean organ, is formed in the early stages of development. *Iris pseudacorus* and *Acorus calamus* are included into hypogeogenic rhizomes according to their features of formation of subterranean organs. The upper part of the rhizomes is yellow-green or dark green, the inside is pink or light purple. The joints that make up the rhizome are densely located and become thicker depending on the age of the plant. It is characterized by the presence of leaves – cotyledons - which change shape at the joints, and the formation of shoots that form new rhizomes in their axils.

Under the conditions of introduction, *Menyanthes trifoliata* produces rhizomes 45-50 cm long in one year, their diameter reaches 1.6 cm on average, and their weight reaches 50-55 g. Plants in the artificial basin produce rhizomes 10-16 cm long, 0.8 cm in average diameter, and 4-5 g in weight.

The additional roots of the introducers are contractile roots according to their structure and grow to the depth of 0.5 meters. Additional roots grow from rhizome joints and joint spaces. Lateral roots, third and fourth order roots are formed from additional roots and they perform the function of the root system. Roots are formed mainly in 1-2-year-old rhizomes. Depending on the living conditions of plants, roots are sometimes formed on 3-4-year-old rhizomes. In 4-6-year-old rhizomes, due to the death of additional roots, jagged scars are formed in their joints. Due to the rotting process in the joints of 7-8-year-old rhizomes, their length is always limited.

As A.N. Obukhov points, [3] the rhizome of *Menyanthes trifoliata* is 8-15 mm thick and produces few additional roots from the lower part of the rhizome. The stronger the rhizomes that *Menyanthes trifoliata* produces, the longer and healthier the additional roots that grow from them.

During the formation of the root system of *Menyanthes trifoliata*, 2 types of additional roots are formed: the first one is thick, long, less branched and vertically developed; the second is thin, short and fast-branching roots, located horizontally. It was noted that the growth rate was the same in the early periods of root growth (up to 20 days).

In the later stages of root growth, long roots continue to grow vertically, while short roots begin to form a horizontal root system. Short roots lag behind long roots due to the fact that they stop growing tall and start forming lateral roots of 3,4 order.

In three months, the short roots grew up to 3.5-4 cm, the length of the second-order roots they formed reached 8 cm, the length of the third-order roots reached 2.5 cm, and the length of the fourth-order roots reached 1-1.5 cm. The main growth of long roots was observed in the tip, and later, second and third order roots were formed. The morphology of the root, the dynamics of the formation of the root system, the level of its development and how deep it penetrates into the soil are primarily determined by the biological characteristics of the plant. The rate of growth and development of the root system is greatly influenced by the physical properties of the soil, the distribution of moisture and nutrients in it.

During the growing season, these plants form a set of photophilous leaves. According to observations, these leaves form rhizomes, which are subterranean organs, during growth. Each leaf forms one joint. The rhizomes are formed during the season according to the growing conditions. The slower the plant's leaves grow, the longer and thicker the rhizome joint it produces.

Due to the rapid growth of the leaves in the summer months, the rhizome joints formed from them were small and very densely arranged. According to the results of the study of the morpho-biology of the rhizomes of the introducers, they are plants with hypogeogenic rhizomes, according to the formation of subterranean organs, and the joint interval of sympodial branched rhizomes is long or short and thick.

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