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## Benefits Of The Properties Of *Laurocerasus Officinalis* And Possibilities Of Microclonal Reproduction

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### ABSTRACT

*Laurocerasus officinalis* (a synonym for the name *Prúnus laurocérasus* according to the old classification) - medicinal laurel has bactericidal properties, that is, it releases a wide variety of volatile substances, including phytoncides, which cleanse the environment from microbes and bacteria, and improve the microclimate. Due to these properties, this plant has high sanitary and hygienic properties. Based on this, cherry laurel is recommended for wide target cultivation. And for this it is necessary to develop the most effective methods for propagating this tree. The method of microclonal propagation of the apical meristem part of shoots in vitro is proposed for use.

## KEYWORDS

*Laurocerasus officinalis*, in vitro, reproduction, phytoncid, apical, meristem, improvement, microclimate.

## INTRODUCTION

All over the world, as priority areas of landscaping in settlements, special attention is paid to the search and identification of highly decorative and at the same time resistant to various external factors of plant species and the development of optimal effective methods for their accelerated reproduction. From this point of view, representatives of the species *Laurocerasus*, and in particular the cherry laurel (*Laurocerasus officinalis*), are of promising importance. Its main positive qualities are unpretentiousness, high frost resistance and textured foliage that does not fall for the winter, giving the plant a special look. In addition to these important qualities, it should be noted that cherry laurel produces phytoncides. The phytoncides of the leaves of cherry laurel are harmful to many insects, especially house flies, as well as forest ticks and even rodents. Even a small stick of cherry laurel repels insects [1, 12]. Phytoncides of young leaves are also toxic for bacteria, for dysentery bacillus, that is, this type of evergreen tree also has bactericidal properties, releasing substances that cleanse the environment and thus protect other plants growing around it from harmful microorganisms, insects and animal fungi. improves the microclimate and thus has high sanitary and hygienic properties. Phytoncides of plant cells of cherry laurel infect not only plant pathogens, but also pathogens that cause diseases of humans and animals. In general, cyanic acid, essential oils, chemicals, resins, alkaloids, phenols, etc., naturally formed in plants have phytoncidic properties. These substances have different chemical

composition, but are a natural immunogenetic factor common to all plants.

The leaves, bark and fruits of *L. officinalis* have medicinal properties, they contain 5-10% tannin in the leaves and 10-11% in the bark, which can be used to obtain a duplicate extract. The prepared so-called cherry laurel water contains amygdalin, which is used as a soothing and pain reliever. The leaves also contain a lot of essential oil, which is used to add aroma and flavor to foods such as tablets, milk and soft drinks. In addition, herbal medicine with cherry laurel leaves is used in medicine - for pulmonary tuberculosis, in homeopathy - for epilepsy, whooping cough and heart disease. Its fruit is used in the preparation of wine and soft drinks. *L. officinalis* seeds also contain sucrose, essential oil (1%, benzaldehyde, benzaldehyde cyanohydrin), fatty acids and many others and tannins.

## THE PURPOSE OF OUR WORK

The study of the medicinal species *L. officinalis* cherry laurel to substantiate the bioecological properties, and its recommendations for mass reproduction, as well as the development of technology that ensures the cultivation of standard seedlings and the introduction of this crop into widespread practice.

## MATERIALS AND METHODS

The study involved the species *Laurocerasus officinalis* M. Roem, which belongs to the Rosaceae Juss family. The genus *Laurocerasus* includes about 25 species. In the countries of

the Commonwealth of Independent States, one species grows wild, and in culture - three species [2]. In the Botanical Garden. F.N. Rusanov of the Academy of Sciences of the Republic of Uzbekistan, two species passed the introduction test - *Laurocerasus officinalis* M. Roem, and *Laurocerasus caroliniana* M. Roem. In Tashkent, the plant was first introduced in 1984. In the Botanical Garden of the Academy of Sciences of Uzbekistan, where the plants are grown from seeds obtained from Latvia. At the age of 26, the tree has reached a height of 5 meters. There is a plant in the same garden, grown from seeds sent from Hungary in 1990, these samples at the age of 21 reached a height of 2.5 meters. The cherry laurel blooms in March, and the fruits ripen in July, every year, but not abundantly [8]. Due to the fact that many introduced plants under new conditions do not form seeds, or give poor-quality seeds, most ornamental plant species and forms have to be propagated vegetative.

Rational use of natural plant resources, direct introduction into the culture of the most economically valuable species and forms of wild woody plants require the development of the most effective methods of their reproduction. *L. officinalis* has highly decorative and medicinal properties. These plants have different characteristics depending on living conditions, phases of growth and development, and the season. This affects the efficiency of the selection of plant fragments for reproduction. To recommend obtaining mass plant material, we used the method of microclonal propagation (in vitro) of the apical meristem. This method opens up significant prospects for a faster and healthier reproduction of valuable ornamental plants and the production of high-quality planting material and allows you to reduce the time for growing standard seedlings by 2-3 years, depending on the type of plant. The founder of

microclonal reproduction of plants was the French scientist Morel [9; 10; 11], he found that apical meristems of some plants are capable of forming calli if the nutrient medium is enriched with vitamins, glutamine, cysteine, and kinetin. By adding gibberellic acid, a miniature rod was obtained. These observations formed the basis of the method of plant micropropagation. Since then, the problem of microclonal reproduction of plants has become relevant in modern plant physiology and agriculture. We have used several methods of in vitro microclonal propagation of plants [3, 5, 7].

In the experiment, the size of the explants reached 0.5-1.0 mm in length. All explants were obtained from the meristem of the upper bud of the plant. Cultivation of explants was carried out in solid nutrient substrates, consisting of such nutrient media as Murashiga and Skooga, Fossard, Mullen and Eniga. In this study, Murasig and Skoog environments were used. During the main stages of explant preparation (micro-cutting of cuttings), the material was rinsed in running water for 1.5-2 hours. Then it was washed in a neutral washing solution (30-40 minutes). Be sure to wash the cuttings in distilled water for 30-40 minutes. After that, the main sterilization of the material was started, which was carried out in a 0.01% thimerosal solution. Then the material was kept for 2-5 minutes in a 30% ethanol solution in a laminar flow hood and washed with sterile water. After that, the cell tissue is treated with a liquid solution to greatly accelerate the formation of callus.

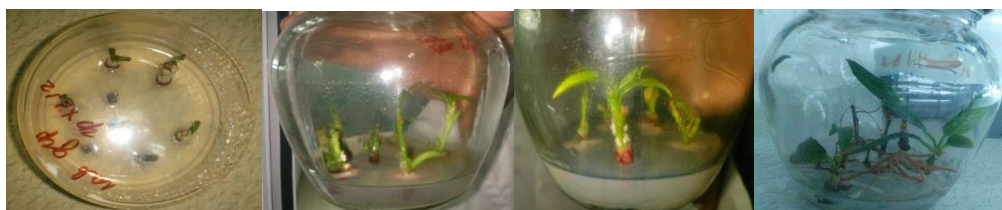
Experts know that the effectiveness of micropropagation largely depends on the method of introducing the explant into a sterile culture and the correct choice of the nutrient medium: its chemical composition and physiological properties must correspond to the tasks that the medium must fulfill at each

stage of micropropagation. It is sometimes recommended to soak the seedlings in distilled water for several hours to remove phenolic compounds before transferring them to the culture medium.

## RESULTS

Currently, one of the most effective ways to obtain healthy seedlings is the cultivation of medicinal species (for a number of reasons, poorly reproduced from seeds) in special laboratory conditions (in vitro) by the method of microclonal reproduction of the meristem of the apical part of the plant shoot. The regenerative properties of the explants depend on the age of the source of the apical meristem. When analyzing age variants of plants used as a source of the meristem, it turned out that the highest rooting rate was observed in young plants. This conclusion was

reached as a result of the fact that we used the shoots of maternal plants aged 9 and 38 years. And it was noted that explants obtained from a 9-year-old mother plant rooted faster and more in quantity. The regenerative feature of the kidney meristem in this experiment was determined by the appearance of callus and the formation of primary roots 15-20 days after transplanting the explant into the nutrient medium. Factors such as the age of the mother plant and the length of the growing bud are also strongly influenced by the regenerative properties of the explant. As a result of our research, it was found that the second and third buds located below the top of the semi-lignified shoot, regardless of the age of the mother plant, have a high regenerative capacity during in vitro micropropagation. In the buds located at the bottom of the shoots, this feature is much weaker.



Picture. *Laurocerasus officinalis* at different stages of micropropagation

1 - the first stages of callus formation; 2 - material after 3 months of cultivation in vitro

## THE DISCUSSION OF THE RESULTS

The efficiency of micropropagation largely depends on the method of introducing the explant into a sterile culture and on the correct choice of the nutrient medium: its chemical composition and physiological properties must correspond to the tasks that the medium must perform at each stage of micropropagation. That is, the physiological age of the explant is also undoubtedly important for morphogenesis. Naturally, the younger the body, the faster the explants develop. It is

sometimes advisable to immerse the explants in distilled water for several hours to remove phenolic compounds before transferring them to the culture medium. According to R.G. Butenko [4], the process of microclonal reproduction begins with the isolation of a sterile explant and its transfer to the nutrient medium. Sterilization requires maximum preservation of plant tissue using the least toxic substances to ensure that a minimum amount of infection is maintained and a

maximum amount of intact tissue capable of growth and new growth is preserved. This rule should also be followed when determining the sterilization duration. In isolated *L. officinalis* plants from the apical part of the meristem, the process of regeneration begins in February-March, during the budding period, and the peak of its activity falls on May-June, the period when the shoots are actively growing. As a rule, at this time in perennial trees and shrubs there is an increase in the activity of auxins and a decrease in the number of growth inhibitors [6].

Considering the importance of *L. officinalis* in medicine and pharmaceuticals, food industry and other industries, as well as its resistance to the harsh continental climate of the republic, we consider it necessary to recommend this type of tree for active use in landscaping to improve the microclimate of the environment in the Central Asian region. The ability to drive away harmful insects is the basis for recommending the placement of cherry laurel saplings for planting around cotton fields. This can be one of the alternative (natural) methods of combating harmful insects, which by their activity harm the harvest of agricultural crops and have a negative impact on the duration of their growing season.

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