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BIOECOLOGY, AGROTECHNOLOGY AND MEDICINAL APPLICATIONS OF PINK CATHARANTHUS PLANT

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Abstract: The modern scientific name of this plant is pink catharanthus (*Catharanthus roseus*). It is formed from the Greek words catharos ("clear, pure") and anthos ("flower") and perfectly reflects the characteristic feature of the plant - unusually pure shades in the color of flowers.

When scientists first saw the plant, they decided that it was the closest relative of the famous and beloved in Europe periwinkle (*Vinca*), and therefore attributed it to this genus. And for a long time the plant was called pink, or Madagascar, periwinkle. But then the botanists took a closer look at him and realized that the mistake came out - not the brother of the periwinkle of the Madagascar guest, but only a cousin. The species migrated first to the genus *Lochnera*, and then to the genus *Ammocallis*, and only in 1837 a new genus *Catharanthus* was described.

While scientists were putting things in order in the classification, growers got used to the name pink periwinkle, or rosé wine, and still rarely use the correct name - catharanthus.

Keywords: Pink periwinkle, cayenne jasmine, maiden, wheel rim, fertilizers

Introduction

The plant is widespread in India, Indochina, the islands of Java, Saint Mauritius, Madagascar, the Philippines, Cuba, Reunion. In the former USSR, the first work on the introduction of the catharanthus was started in 1958 in the subtropics of Western Georgia. It is cultivated in Western Transcaucasia, in the Kuban, in Southern Kazakhstan. In more northern regions, it is traditionally considered an indoor perennial, but recently it has been increasingly used to decorate street compositions in annual culture.

Tropical evergreen shrub up to 60 cm high. Stems are erect, branched in the upper half. Leaves are opposite, sessile, oblong-lanceolate, entire, dark green with a white midrib, shiny, up to 7 cm long. Flowers are five-membered with a wheel-shaped corolla up to 3 cm in diameter, pink, sessile in the axils of the upper leaves. The fruit is a bivalve sickle. Seeds in our conditions are not tied. A plant grown

from seeds planted in late winter will bloom in late spring and bloom until fall.

Materials and methods.

Until the 80s of the twentieth century. The variety of forms was small: in addition to the natural form with pink flowers, in the catharanthus, there were plants with white flowers, as well as with white ones with a pink eye. The situation changed dramatically when in 1976 at one of the US universities a program was launched to study interspecific hybrids of the genus catharanthus. Seeds of several species and forms of catharanthus were collected and their mass crossing among themselves began in order to obtain compact, profusely flowering plants with new unusual colors of flowers. The program was a complete success: by 1988, varieties such as Grape Cooler with pale pink flowers with a pink eye and Peppermint Cooler with white and red eyes had appeared. After that, breeding work with catharanthus was not interrupted, which led to the emergence of a large number of highly decorative hybrids,

which they began to readily use in landscaping. After all, these new hybrid forms (strictly speaking, all modern varieties are descendants of interspecific crosses) are distinguished not only by abundant flowering and flowers of unusually pure shades, but also by significant resistance to drought and other unfavorable weather conditions. The jury members of various competitions could not fail to appreciate the beautiful catharanthus and, since 1991, have regularly marked their new varieties with the most prestigious awards.

Several excellent varieties of catharanthus have been developed over the past decade. Apparently, the most famous and titled at the moment the varietal series - "First Kiss", bred by the German company "Benari" ("Benaru") and includes 13 color options. Plants of this varietal series are distinguished by compact "bushes" about 30-40 cm high and flowers up to 5 cm in diameter in a wide variety of colors. The super novelty of this series - "First Kiss Blueberry" - with blue-violet flowers conquered last year flower growers in the USA and Canada and entered the top three winners of the annual All-America Selections.

Compact plants of varieties Vitesse, Viper, Jaio are no less beautiful. Especially for hanging baskets, the series "Mediterranean" ("Mediterranean") and "Cascade Lossom" were bred, the shoots of which, with appropriate care, can reach lengths of up to 1.5 m.

Location: warm, sunny, sheltered from cold winds. Crowded plants should not be planted on flower beds, otherwise, in rainy weather, the catharanthus will suffer from a lack of ventilation.

The soil: should be well moisturized, fertile, free from excess salts and have a pH of 5.5-5.8. An earthen mixture is prepared from equal parts of sod and leafy soil, humus, peat and sand.

Reproduction: by seeds and vegetatively. Seeds are sown to a depth of 1-2

cm in late winter or early spring. The sowing must be covered with a dark film, since complete darkness is required for the germination of the catharanthus. At a temperature of about 24 C, seedlings will appear in 7-10 days. After sprouting, lower the temperature and expose the bowls to light. The first feeding is carried out no earlier than 2 weeks after germination, the phosphorus content in the fertilizer should not be high and it is better if nitrogen is presented in the fertilizer in nitrate form. It is advisable to make a pick when the plants reach a height of 6-8 cm and have 4 true leaves.

Catharanthus, in addition to seeds, perfectly reproduces with green apical cuttings. To do this, they are placed in washed sand and covered with a jar or plastic bag. They take root even in water.

Opinions about the need to pinch young catharanthus differ. In principle, it is not necessary to pinch all modern varieties, since the sign of enhanced tillering is embedded in their genotype. Nevertheless, to get a more compact bush, young grape seedlings are pinched once or twice. Planted at a distance of 30-70 cm.

Usage: as a ground cover, since the plant tends to grow rapidly and occupy all the free space, covering the soil with a dense carpet. The growth in popularity of the catharanthus was facilitated by the emergence of a fashion for decorative elements in the form of hanging baskets, which were often decorated with it. Its great advantage is that it is undemanding to soil moisture, as it dries quickly in suspended formulations. Although this plant has long been known in Great Britain, it spread much later in continental Europe. True, in some countries with cool climates, for example in the Netherlands, the catharanthus has to be placed in special places, especially protected from cold winds.

Results and discussion.

The modes of LED lighting, which are effective for obtaining raw material of plants of the catharanthus roseus (lat. Catharanthus roseus (L.) G. Don, family Apocynaceae) in a closed ground, have been established. It is shown that the maximum accumulation of dry mass of all plant organs is provided by LED illumination with a blue to red light ratio (C: K) equal to 1: 4 and a photon flux density (PPF) of $500 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$. Under illumination with a C: K ratio of 1: 1.3 and a PPF of $200 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$, a slowdown in growth processes, a decrease in flowering intensity and an accumulation of dry mass of C. roseus were observed. However, this regime turned out to be effective for stimulating the processes of biosynthesis and accumulation of terpenindole alkaloids in leaves and roots, as well as phenolic compounds in the aerial parts of plants. For the formation of the root system of C. roseus and the accumulation of phenolic compounds in it, the optimal lighting options were those with the highest tested PPF level, $500 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$. Thus, the highest yield of pharmacologically valuable terpenindole alkaloids of C. roseus leaves is provided under illumination with a C: K ratio of 1: 1.3 ($200 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$) and 1: 4 ($500 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$) 123.54 ± 1.42 and 127.21 ± 2.54 mg / plant, respectively. The maximum yield of alkaloids accumulating in the root system was observed under PPF illumination of $500 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$ and a C: K ratio of 1: 2.5 and 1: 4 99.14 ± 5.93 and $89, 29 \pm 7.13$ mg / plant, respectively.

Growing a catharanthus in indoor conditions is a simple and even pleasant process, because the plant is very grateful and responds to care with long and abundant flowering. Katarantus will feel great on a light windowsill (it should be protected from the scorching rays of the sun) with regular spraying and feeding every two to three weeks with a solution of full mineral fertilizer. In the summertime, the pot with the plant can be taken out to the balcony, protecting it from rain, heat and wind. In winter, the plant is best kept in a

bright, cool room with an air temperature of 10-15 ° C. In spring, the branches of the catharanthus should be cut by about a third.

Conclusion.

Traditional healers in Madagascar and India have long used catharanthus as a remedy for diabetes, to lower blood pressure, to treat coughs and to treat tumors of various origins. The medicinal properties of catharanthus attracted the attention of researchers in the United States and Canada after World War II, when it became known that the soldiers of these countries, who were in the Philippines during the war, used the leaves of the plant instead of insulin, which was then unavailable. Studies of plant extracts have shown that when they are consumed, the effect of lowering blood sugar levels is very weak, but in laboratory animals suffering from leukemia, significant positive changes in the blood formula were noted. Later, scientists from catharanthus isolated alkaloids with antitumor activity, and set up the production of drugs such as vinblastine and vincristine on their basis. Ready-made preparations from catharanthus, as well as home-made tinctures, ointments have a pronounced therapeutic effect, but often cause strong side effects. Catharanthus can be treated only under the supervision of a doctor.

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