

**STEVIA REBAUDIANA: GLOBAL IMPORTANCE, DEVELOPMENT
PROSPECTS, AND CULTIVATION OPPORTUNITIES IN UZBEKISTAN**

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Abstract: Stevia rebaudiana is a low-calorie natural sweetener widely used in the food and nutraceutical industries. This study analyzes its biologically active properties, market trends, breeding and agrotechnological approaches, as well as the prospects for cultivation in Uzbekistan. The results indicate that stevia is a promising crop for healthy nutrition and export-oriented production.

Keywords: Stevia rebaudiana, steviol glycosides, natural sweetener, breeding, agrotechnology.

Stevia rebaudiana Bertoni has attracted great global interest in recent decades as a natural, low-calorie sweetener. The issue of reducing sugar consumption has become a pressing issue due to the increasing prevalence of diseases such as diabetes, obesity and metabolic syndrome in the world's population. The widespread concept of healthy eating, the increasing demand for "clean-label" products and the growing awareness of artificial sweeteners have significantly increased the need for natural sweeteners. In this regard, stevia is considered the "sweetener of the future".

Stevia is a perennial plant originating from the Paraguay and Brazilian regions of South America, the leaves of which contain steviol glycosides of diterpene nature. Among these compounds, stevioside and rebaudioside A are the most important. Despite being 200-300 times sweeter than sucrose, they are almost calorie-free. Therefore, stevia plays an important role in diabetic and dietetic nutrition.

Scientific literature shows that stevia is not only a sweetener, but also a biologically active plant. Steviol glycosides have been shown to participate in the regulation of glucose metabolism, stimulate insulin secretion, and help reduce blood

glucose levels [1]. In addition, steviol compounds have been shown to have a vasodilating effect and help normalize arterial pressure. Stevia leaves are rich in phenolic compounds and have strong antioxidant activity. This property is important in protecting cells from oxidative stress. At the same time, anti-inflammatory and antibacterial effects have also been identified [2].

Therefore, stevia extracts are widely used in the functional food and nutraceutical industries. Modern studies evaluate stevia as a promising plant in the preventive and therapeutic direction.

The stevia segment in the global market has been growing rapidly in recent years. The use of stevia in beverages, confectionery, dairy products and diet foods is expanding. The main factors driving market growth are the trend of healthy eating, sugar reduction policies and international regulatory approvals. In particular, the recognition of steviol glycosides as safe by JECFA played an important role in the development of this market. In the future, it is expected that the demand for fractions with a high content of rebaudioside A and taste improvement technologies will increase.

The selection and biotechnological development of stevia is also one of the important directions. The main goal is to create varieties with high leaf biomass yield, optimized glycoside profile and good taste properties. Since stevia is often a heterozygous plant, fragmentation of traits is observed when propagated from seeds. Therefore, vegetative propagation and clonal selection are widely used [3].

In vitro microclonal propagation technologies allow for the rapid multiplication of high-quality planting material. This method is important in ensuring genetic uniformity. Screening of genotypes based on molecular markers accelerates the selection process. Metabolic engineering approaches open up the possibility of controlling glycoside biosynthesis.

From an agrotechnical point of view, irrigation regime, planting density, harvesting time and nutrition play an important role in stevia cultivation. Insufficient irrigation reduces leaf yield, while excess moisture leads to root problems. Optimal irrigation regime ensures stable biomass accumulation. Planting density also affects leaf yield. Harvesting before flowering can increase glycoside content.

Salinity is also an important factor. In most cases, salt stress reduces biomass and glycoside content. However, some studies have shown that glycoside ratios can change under mild salt stress [4]. Therefore, it is important to adapt agrotechnology to salinity conditions.

Stevia cultivation has high prospects in Uzbekistan. The country's climate is sunny and the growing season is long, which is favorable for the accumulation of leaf biomass. State policies aimed at the development of medicinal plants and processing opportunities make this area economically attractive. Especially hot regions such as Surkhandarya are suitable for stevia plantations.

At the same time, salinity, the development of regional agrotechnology, the lack of quality planting material and integrated pest protection systems are urgent issues. In the future, the development of agrotechnological packages suitable for regions, the selection of salt-tolerant genotypes and their integration with biological preparations will remain important areas.

In conclusion, stevia is a promising crop in Uzbekistan's agriculture with high added value, export potential, and meeting the requirements of healthy nutrition. The combination of scientifically based breeding, biotechnology, and agrotechnology will enable the sustainable development of stevia cultivation.

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