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CULTIVATION AND CHEMICAL COMPOSITION OF THE PLANT STEVIA REBAUDIANA BERTONI, USE IN MEDICINE

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ABSTRACT
This article contains information about the plant stevia rebaudiana becht (stevia) and its chemical composition and its use in medicine.

Key words
stevia rebaudiana becht, tocopherol, vitamin K, ascorbic acid, carbohydrate, cellulose, amino acid, potassium, phosphorus, magnesium, iron, calcium, zinc, bactericidal, antiseptic, antibacterial, immunity.

INTRODUCTION

For centuries, decoctions and tinctures prepared on the basis of natural plants have been used in the treatment of various diseases in folk medicine. Research in the field of chemistry and pharmaceutical sciences has led to the creation of drugs and drug forms not found in nature based on new substances. However, the side effects of synthetic drugs with negative effects on the body have also been identified. For this reason, the interest in natural medicines is increasing now. The synthesis of new biologically active substances, the treatment and prevention of viral diseases in medicine based on them, the problem of creating new drugs for immunodeficiencies of various etiologies is one of the main tasks of today's bioorganic chemistry. D, F and new respiratory virus infections are increasingly widespread. One of the promising ways to create new drugs is to search for new biologically active substances from existing natural compounds and their derivatives. Stevia plant is one of the medicinal plants that has its own characteristics. The substance that gives the stevia leaf its main medicinal properties is the glucoside-stevioside in its composition. Medicines from the stevia plant are the best substitute for sugar. It is non-toxic, has no negative effects, tastes good, and is cheap. All this is very convenient for people suffering from diabetes and obesity. Dozens of medicines have been created on the basis of the stevia plant and are being used effectively in medical practice.

THEORETICAL PART:

Natural reserves of stevia - (Stevia rebaudiana Bertoni), native to the mountainous regions of South America (Paraguay), are found in areas 300 m above sea level. The plant is cultivated in Japan, USA, China, Thailand, Israel, Korea, Russia, Moldova, Ukraine and other countries. More than 200 species of stevia grow in North AmericaStevia plants are grown on 32,000 hectares of land worldwide, of which 24,000 (75%) belong to the People's Republic of China.More than 180 species of plants belong to the stevia family of the Asteraceae family. Stevia - Stevia rebaudiana Bertoni is one of them. Stevia is an annual plant up to 1 meter tall. Its leaves are simple, opposite on the stem, 2-3 cm long. The surface of the leaf is smooth, the front side is pencil-shaped. Flowers are collected

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in 6-7 white complex inflorescences 3-4 mm long. The fruit is 3-4 mm. It blooms in September-November. The seeds ripen in October-November [1-6], (Fig. 1).

Figure 1. Appearance of Stevia rebaudiana Bertoni plant.

The chemical composition of the stevia plant is unique, and its leaves contain a sweet-tasting diterpenoid (stevioside) glycoside. Stevioside is 300 times sweeter than 0.4% sucrose solution and 150 times sweeter than 10% sugar solution (Figure 2). In addition, it contains flavonoids (quercetin, rutin), minerals - (calcium, phosphorus, potassium, zinc, iron, chromium, magnesium, selenium, copper, manganese, cobalt), and vitamins (group V, A, C, E and etc.) are available[1-6].

Medicinal properties of Stevia rebaudiana Bertoni plant (antisclerotic, immunomodulating, antihypertensive, anticarcinogenic effects) have been studied by Japanese and Russian scientists for 20 years. They contain 8 diterpene glycosides, vitamins A and C, 17 amino acids, flavonoids, unsaturated fatty acids and essential oils. However, at present, only "stevoside" drug has been introduced into production, it is a combination of diterpene glycosides and is widely used as a natural sweetener in the food and pharmaceutical industries. It is 300 times sweeter than sucrose, has no calories, is non-toxic, and is recommended for patients with diabetes [1-6].

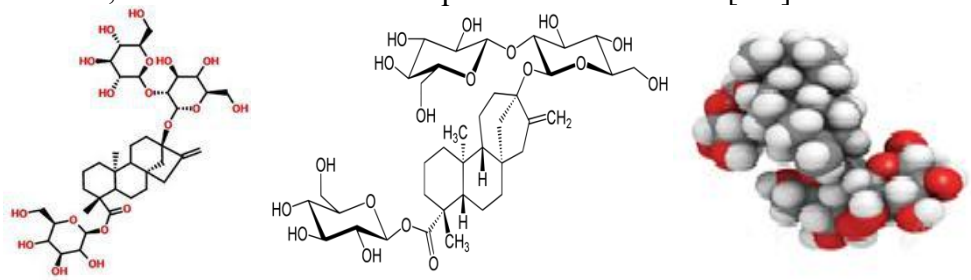

Figure 2. Molecular formula and conformational structure of stevioside.

The stevia plant has a general strengthening and strengthening effect on the body in medicine. In ancient times, the Indians of Brazil and Paraguay used stevia as a food and sometimes to treat gastrointestinal and kidney diseases. At the beginning of the 20th century, French scientists discovered stevioside and rebaudioside substances in this plant[1-6].

The substances contained in the plant prevent the accumulation of fat and other substances in the teeth. This prevents tooth enamel from being eroded by microbes. Stevia controls the amount of sugar (sugar) in the blood and helps in the activity of the insulin hormone, and is of great importance in supplying the body with sugar. Glycoside (stevioside), a biologically active substance contained in

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the stevia plant, is one of the substitutes for natural nutrients in the body. Also, stevia products are used in diseases associated with diabetes, accumulation of excess fat in the body, and disorders of metabolic processes. In addition, it is used as a hypotensive (lowers blood pressure), cardiotonic, antibacterial, antifungal, antiviral, diuretic, tonic, and an effective tool for treating wounds.

Taking into account that sweets are not given to patients with diabetes, it is effectively used to satisfy the need for sweets and to treat diabetes. China ranks second in the world in terms of the incidence of diabetes after the USA and Russia. In 2008, India had the highest number of people with diabetes (30 million). Due to the increased demand for stevia raw materials due to this disease, farmers started to establish stevia plantations in large areas. Also, India is one of the countries with very favorable soil and climate conditions for growing stevia. Currently, the annual production of stevia plant in India is about 600 tons.

Also, in Japan, the stevia plant is used on a very large scale, and one hectare of land is used for up to 270,000 US dollars.

Although the sweetness of this plant is high, it does not cause unpleasant conditions in patients with diabetes. Stevia substances are also used in folk medicine for diabetes. In this case, the crushed (flour) of the plant product destroys pathogenic microbes and has a positive effect on the immune system. It is also used in heart muscle inflammation, improving the condition of body skin and hair, and removing cholesterol from the body. In addition, stevioside is widely used in the confectionery industry (Japan) instead of sugar in the preparation of soft drinks and desserts.

Cultivation of stevia plant in 1931 N.I. Introduced by Vavilov in Nikita Botanical Garden. Later, it was acclimatized by scientists of research institutes of Tatarstan, Kazakstan, Ukraine, Egypt, Moldavia, and the main agrotechnological measures were developed.

This plant was first localized in Uzbekistan in 1996 by scientists of the National University of Uzbekistan and Tashkent State Agrarian University. Stevia plantations are expanding in our republic. For example, "Oloyorokhun" stevia experimental farm in Shorchi district of Surkhondarya region has been organizing and maintaining plantations of this plant on an area of 7 hectares. Also, in 2019, stevia plantations were established on an area of 60 hectares by the "Healing Herbs and Organics" organization in the Ortachirchik district of the Tashkent region. This year, this organization planted stevia seedlings on another 64 hectares. The important thing about stevia sugar is that currently its consumption rate is very unlimited, and no negative effects for organisms have been observed [1-6].

DISCUSSION OF RESULTS

Stevia cultivation and processing processes have been studied in our country. It is used to propagate it from seeds and to grow seedlings using the pen method. The results of the ongoing practical work show that the stevioside content of the stevia plant grown in the republic is much higher than the amount of stevioside in plants grown in some countries of the world - 19.7 % (and 16% in South Korea).

As mentioned above, breeding of medicinal and spice plants and creation of cultural plantations in our country will provide an opportunity to meet the demand of the pharmaceutical industry for medicinal plants in a certain amount.

What to pay attention to when growing stevia! Stevia is adapted to the air temperature of the subtropical, temperate climate and grows well at a temperature of up to 24°C. Soils where stevia grows best are loamy (sandy) soils with normal moisture. When planting and caring for a plant, for its normal development, a land area is selected that is not dense, has a good drainage system, receives sunlight, is fertile and has sufficient irrigation. Because this plant does not grow well in places where the sun does not illuminate well (shade) and infertile soils. The area selected for planting seedlings is

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plowed to a depth of 25-30 cm in autumn. In this case, 100 tons of local fertilizer (manure) and 200 kg of phosphorus are applied to the plowed area per hectare, and the land is plowed. In order for the root system of the plant to develop well, the soil is softened twice. It is also cleaned of weeds. Fertilization of plant seeds is low and quickly loses its ability to germinate. Therefore, the initial process of plant cultivation begins in the greenhouse. The optimal period for planting stevia seeds (in greenhouse conditions) is January. Plants are planted in special places (floors) in greenhouses for growing seedlings. Sown seeds are sprinkled with a sieved mixture (1 manure: 1 sand: 3 soil). It is desirable that the thickness of the soil is 0.2-0.3 cm. Air temperature reaching +15°C is a favorable opportunity for plant seeds to germinate. Therefore, when growing stevia, seeds are first planted in special nurseries. When the temperature is kept at +18...+25°C, young roots will appear within a week. When the height of the seedlings reaches 15-20 cm, stevia is taken to the open field in late March and early April. To obtain leaf or seed yield, the row spacing is 2 times. To get a leaf crop, row spacings are drawn from 70 cm, seedlings are planted at an interval of 20 cm, and to obtain seeds, row intervals are drawn from 90 cm, and seedlings are planted at an interval of 25 cm. Plant feeding starts from the second month of vegetation. Watering during the season (until October) is carried out depending on the condition of the plant. One of the unique features of the plant is that stevia stops growing at a temperature below 10 0C. This means his attitude to the external environment and his partial adaptation (idoadaptation). The yield of stevia per hectare is 5-8 centners in the first years and 18-20 centners in the following years.

CONCLUSION:

1.Based on its bioecological properties, it is considered appropriate to establish cultural plantations of the stevia plant in the Southern regions of the republic (Surkhondarya, Kashkadarya) and Samarkand and Tashkent regions.

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