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# FROM THE STEVIA REBAUDIANA PLANT SEPARATE RECEIVED GLYCOSIDES AND THEIR APPLICATION TECHNOLOGY IN NG FOOD PRODUCTS

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**Abstract**
This in research steviol glycosides in itself keeper plants - especially Stevia rebaudiana and other less studied types of chemical composition, biological activity, sweetness level and food in the industry technological application scientific basically studied. Extraction and cleaning technologies improved, HPLC, FTIR, UV- Vis methods through analysis Tested. parties based on drinks and bread to their products glycoside add through of products physicochemical, organoleptic and preservation properties analysis The research was conducted results based on healthy nutrition requirements answer giver technological direction working It was released.

**Keywords:** Steviol glycoside, Stevia, natural dessert, extraction, food technology, HPLC, sugar instead clicker.

## Introduction

### Login

World health storage organization to the information according to , in excess of sugar consumption diabetes , cardiovascular vein and excess weight such as to problems take is coming . This because of natural , calorie amount low , but sweetness level high was substances working to go out need Stevia rebaudiana from the wire taken steviol glycosides these They are stevioside and rebaudioside A such as from components consists of sugar with 200–300 times compared is sweeter . However their effective separate to be taken , to be cleaned and food -

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food to their products usage according to technologies still complete working not released .

**Research materials and methods**

**Plant samples collection**

Stevia rebaudiana Uzbekistan Fergana in the valley in greenhouses A specimen of Rubus suavissimus was brought from China .

**Extraction technology**

The dried leaves were extracted in 60% ethanol solution at 70°C for 3 hours. The concentrated extracts were obtained by filtration and vacuum concentration. Macroporous layered resins were used for purification.

**Chemical analysis methods**

**HPLC ( High effective liquid chromatography )** : steviol glycosides quantitative analysis .

**FTIR - spectroscopy** : functional groups to determine .

**UV-Vis spectrum** : purity level and concentration.

Physicochemical properties such as **pH, dry matter, density .**

**Research results and analysis (Main part)**

**Steviol glycosides extraction and purification technology**

In the study , to isolate steviol glycosides from the leaves of Stevia rebaudiana , the first stage was an extraction process in 60% ethanol solution at 70°C. In order to ensure the efficiency of the extraction, the extraction time and solution concentration were tested under various parameters. As a result of the experiments, the maximum amount of glycosides could be obtained when the extraction process was carried out for 3 hours.

The extract obtained during the study was partially concentrated in a vacuum dryer and then subjected to purification. In the purification process of steviol glycosides, a macroporous layered resin (Amberlite XAD-16) was used. The composition of this resin showed high efficiency in adsorbing glycosides. During

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the purification process, the glycosides were adsorbed onto the surface of the resin and the impurities were separated by washing with a solution and water.

**Experiment results:**
The separation of steviol glycosides resulted in a purity of stevioside and rebaudioside A of 92–96%. The extracts showed a long shelf life and could be stored for long periods for use as raw materials.

**Chemical analysis and identification**
**High effective liquid chromatography (HPLC)** through taken in the extract main steviol glycosides composition Stevioside and rebaudioside A what separation and quantitative analysis in doing HPLC method very effective HPLC of the apparatus work conditions, column type, eluent composition and leak speed change it to optimal conditions found.

**Analysis Results**

| Plant type | Stevioside (%) | Rebaudioside A (%) | Cleaning rate (%) |
|---|---|---|---|
| Stevia rebaudiana | 7.1 | 4.9 | 94.6 |
| Rubus suavissimus | 1.8 | 0.9 | 89.3 |

Research during **FTIR- spectral analysis** done increased , this through steviol glycosides functional groups (–OH, –COOH, –C=O) and chemical connections is determined . In FTIR spectroscopy, a wavelength of 3300 $cm^{-1}$ -OH groups in length and the C=O group at 1635 $cm^{-1}$ existence Also , **UV - Vis spectroscopy** method through steviol glycosides maximum absorption wave length ~210 nm at it was determined that their typical spectral to the feature suitable is coming .
**Natural sweetness chemical features** and glycosides absorption spectrum wide scientific community by This is confirmed . methods as a result steviol glycosides cleanliness and composition determined and their application for main features separated

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To products technological implementation tests

Steviol glycosides food to the industry application from the test transfer for following products prepared :

**Fruity Juices** – Stevioside and rebaudioside A at a concentration of 0.03% added , sweetness level measured .
**Bread products** – 0.05% steviol glycoside added bread products from the test was held .
**Confectionery products** – low caloric sugar instead of steviol extract added confectionery working It was released

**Organoleptic assessment:**

Juices , bread and confectionery of products sweetness level middle in the standards was evaluated . Out of 30 participants taken grades based on , products approved sugary samples with equal or from it high sweetness to the level has was . Products taste , smell and shape consumers positive thoughts Organoleptic in analysis steviol glycoside added products , sugary options with in comparison, less per calorie has to be with together , good taste to the characteristics has it has been .

**Physicochemical properties :**

| **Indicators** | **Stevia with** | **Sugar with** |
|---|---|---|
| pH | 5.2 | 5.1 |
| Save duration ( days ) | 30 | 30 |
| Antioxidant activity (%) | 68.5 | 22.3 |
| Calories Amount ( kcal /100g) | 4.2 | 38.5 |

**pH** : Steviol glycosidic pH level of products sugary products with in comparison relatively high it has been .
**Save Deadline** : Every both in the group products 30 days during good preserved, its as no how change not observed .

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**Antioxidant Activity** : Steviol glycosidic products antioxidant activity in terms of much high result showed that and their health for useful that shows .

**Products economic efficiency assessment**

Products industry under the circumstances working to release implementation from reaching before , their economic efficiency and profitability evaluated . Steviol glycosides sugar instead of usage as a result working release expenses decreases and working issued products now further economical will be . In research as shown , steviol glycosides sugar instead of use 1 ton product 28–34% savings for provides . This numbers steviol glycosides wide on a scale working release and to apply industry on a scale current to do opportunity open Research **of the results scientific and practical importance** Research steviol glycosides separate to take technology efficiency showed and this substances food - food in the industry of use economic and ecological in terms of usefulness confirmed . This technology using sugar instead clicker natural , calorie low and healthy food - food products working release opportunities This is available . products world in the market ecological clean and healthy food - food products as acceptance to be done possible .

**Scientific conclusion and offers**

**Conclusion**

Research results based on steviol glycosides natural from sources separate to take and them food in the industry application opportunities expanded . **Stevia rebaudiana** o' wire from the leaves taken steviol glycosides , that including stevioside and rebaudioside A, high efficiency with separate taken and cleared . HPLC, FTIR, and UV-Vis spectroscopy such as methods using steviol glycosides chemical composition identified , their high cleanliness confirmed . Extraction and cleaning technologies , as well as steviol glycosides application opportunities expansion for effective in a way working It was released .

From the tests taken results this showed that steviol glycosides food to their products application , especially sweetness as , sugar with in comparison less per calorie has was , but sweetness level high products working to release opportunity

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gives . From this except steviol glycosides application of products antioxidant activity increases , this and them health for useful does .
Also , steviol glycosides usage not only economic , maybe ecological It is also useful in terms of instead of sugar use industry working in the release big in quantity energy and resources to save help also gives carbon trace reduces .

**Offers**

**Technology Enhancement**: Steviol glycosides separation and cleaning technology further develop for new , high effective adsorption materials and extraction methods search recommendation For example , supercritical carbonate solution using separation processes try see possible , because this method glycosides cleanliness further increase possible .

**Industry current Add**: Steviol glycosides food to the industry wide on a scale implementation to grow for new working release lines creation need . Such working release for special equipment and technologies working exit , that's it including glycosides preservation the deadline extension and their quality save stay for new conservation methods current to grow need .

**Economic and ecological Rating**: Steviol glycosides industry under the circumstances working release and application economic and ecological point of view from the point of view in detail analysis to be done must . New technologies working on the way out , to them was demand and working release expenses about in detail forecasts to establish , as well as this of products market and ecological impact to be studied necessary .

**Food products diversification Make**: Steviol glycosides implementation to grow through sweets new kind of food in products , for example , unsweetened drinks , tissues modified bread products and other innovative in products try see This is new . markets to create help gives and steviol glycosides wide use provides

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**Scientific research continue Steviol** glycosides other natural from sources separate to take methods study and their food to the industry application according to scientific research continue to be carried out For example , steviol glycosides other from plants separation and their quality to improve circle new research take to go necessary .

Future research

In the future this in the field done increaseable research steviol glycosides biological activity and their in the body the impact to study focus Steviol glycosides antioxidant , anti-inflammatory against and other health for useful features to determine , their in the body how changes brought release study important .

Also , steviol glycosides synergistic effect and other natural substances , such as vitamins and to minerals the secret of the effect to study through their combinations optimization It is possible . and further effective and healthy food - food products working to go out opportunity gives .

## Recommendations

Uzbekistan under the circumstances Stevia cultivation and again work infrastructure formation . Glycosides extraction for national technologies working exit . Hello . food - food working to issuers technological solutions offer to do

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