

PROXIMATE AND PHYTOCHEMICAL ANALYSIS OF STEVIA LEAVES POWDER

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ABSTRACT

Stevia rebaudiana (Bert) is a plant of composite family and native to Paraguay, its sweetness and calorie free property increased its demand tremendously. It not only imparts the sweetness but also maintain the normal blood sugar level and also in allied industries for diabetics. The leaves of stevia contain more sweetness and having potential application in food industry. The leaves of stevia contain such as moisture, ash, carbohydrate, protein, crude fat and fiber. The study concluded that leaves are rich in carbohydrate, protein and minerals. Phytochemical screening of various extract like aqueous and alcoholic contains anthraquinone, glycosides, saponin, steroids and sterols. Stevia leaves are rich in antioxidant like phenol and flavonoids. According to the further analysis the leaves may consider as source of natural antioxidant and use in food industry

Keywords: *Stevia rebaudiana*, Phytochemical studies, proximate studies, Total phenols

INTRODUCTION

One of the major nutritional problems that face mankind in this century is the consumption of high quantities of fat and sugar, which has been associated with serious health problems, especially diabetes. Diabetes is a global of the twenty-first century and a real threat to the entire world community. Over the past twenty years, the global prevalence of diabetes has increased six-fold. Experts believe that diabetes currently affects 246 million people worldwide. This number is expected to reach 380 million by 2025. Every year, 3.8 million deaths are attributing to diabetes, representing over 6% of the total number of deaths in the world. Every ten seconds, someone dies of

diabetes-related causes. Diabetes is the fourth leading cause of death by disease world¹.

Herbal medicines are being used by about 80% of the world population primarily in the developing countries for primary health care. They have stood through the test of time for their efficacy, cultural acceptability and lesser side effects. Ancient literature also mentions herbal medicines for various diseases for which no scientific proof is available^{2,3}.

The main source of sugar has for long been cane sugar with beet sugar contributing as small percentage. These sugars along with sweetening qualities also have

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been found to contribute calories, which can lead to obesity, a risk factor for some chronic diseases such as hypertension, cardiovascular diseases. Some sugar substitutes are available in the market, natural and some are synthetic. Those that are not natural are, in general, referred to as artificial sweeteners. Researchers are in progress to replace sucrose with natural intense sweeteners, taking into account both health and technological aspects sucrose is used with caution due to its calorie contribution which is correlated with adverse metabolic consequences and carcinogenic effects^{4,5}.

Stevia rebaudiana (*S.rebaudiana*), a natural alternative to artificial sweetener is found to contain over 100 phytochemicals including well characterized stevioside and rebaudioside⁶. Stevioside is one of the principle diterpene glycosides having a sweetness of 30 - 320 times than sucrose. The crude stevia leaves and herbal green powder

is 10-15 times sweeter than sucrose⁷. Besides, it is well known for its application in treatment of many diseases like diabetes, high blood pressure and weight loss in various traditional systems of medicine. Stevia sweetener extractive has been suggested to exert beneficial effects on human health, including antihypertensive, antihyperglycemic, noncarcinogenic, anti-human rotavirus activities, glucose metabolism and renal function⁸. Plant extracts and phytochemicals with known antimicrobial properties can be of great significance in therapeutic treatments^{9,10}. The medicinal value of plants lies in some chemical substances that produce a definite physiological action on the human body. The most important bioactive compounds of plants are alkaloids, flavonoids, tannins and phenolic compounds¹¹. Many plant leaves have antimicrobial principles such as tannins, essential oils and other aromatic compounds^{12,13}.



MATERIALS AND METHODS

The green stevia powder was procured from Bakshish aromatics, Pinjore. The green stevia powder was procured from Bakshish aromatics, Pinjore. The stevia leaves powder was analyzed for proximate like ash, moisture content¹⁴ crude fiber estimation¹⁵. Pro-

tein estimation was done by macrokjeldhal method, estimation of iron by Wong's method¹⁴. Calcium analysis was done by titrametric method¹⁵.

Phytochemical analysis was done on aqueous and alcoholic extract. Alkaloid was done by Mayer's test, glycosides done by Bron-

trager's test. Terpenoids, steroids, tannins, phytosterol were done by Libermann-buchard's test. Flavonoid was done by Shonoda test^{16,17}.

Antioxidants are nonnutritive chemicals that act as food medicine and work

against diseases, reduction of the free radicals in the body. Antioxidant analysis will be done on aqueous extract such as total phenols and flavonoids¹⁸.

RESULTS AND DISCUSSION

Table no. 1- Proximate analysis of stevia leaves powder

Proximate composition	Concentration %DW
Moisture (g/100g)	6.7±1.0
Ash (g/100g)	11.5±0.95
Crude fiber (g/100g)	14.89±0.89
Protein (g/100g)	18.0±0.58
Crude fat (g/100g)	4.2±0.3
Carbohydrates (g/100g)	30.4±1.10
Minerals	
Calcium (mg/100g)	17.70±0.20
Iron (mg/100g)	8.0±1.15

Table no. 2-Phytochemical analysis of stevia leaves extract

Phyto-constituents	Aqueous	Alcoholic
Anthraquinones	+	+
Cardiac glycosides	+	-
Cynagenetic glycosides	-	-
Flavonoids	+	-
Glycosides	+	+
Saponins	+	+
Steroids	+	+
Sterols and triter penes	+	+
Tannins	+	-
Terpenoids	+	-

Table no. 3-Antioxidant activity of stevia leaves extract

Antioxidant	Mean±SD
Flavonoids QE (mg/g)	41.8-67.5
Total phenols GAE (mg/g)	25.5-69.0

PROXIMATE COMPOSITION

The proximate analysis of stevia powder was done for moisture, ash, and crude fiber. The moisture content of stevia powder comes out to be (6.7±1.0). Carbohydrate (30.4±1.10), protein (18.0±0.58), crude fiber (14.89±0.89) and ash (11.5±0.95) con-

tent of stevia leaf were found to be higher whereas fat was estimated to be less in the leaf. It was carried out on dry basis. The one another study shows the similar results of the proximate composition¹⁹.

MINERALS COMPOSITION

Analyzed minerals composition of stevia leaves powder indicated that calcium and iron were found to be 17.70 ± 0.20 and 8.0 ± 1.15 respectively. This further establishes a fact that stevia as a mineral loaded ingredient required protecting body, regulating and maintaining the various metabolic process²⁰.

PHYTOCHEMICAL ANALYSIS

Phytochemicals are biologically active compounds, found within the fruits in small amounts, they are not considered to be established nutrients but nevertheless contribute significantly to protect against degenerative disease²¹. The extract subjected to preliminary phytochemical screening using chemical method showed the most abundant compounds in the extract were of tannins followed by cardiac glycosides, saponins, sterols and triterpenes, terpenoids, saponins, steroids, glycosides and anthraquinones. Test for cyanogenic glycosides, however showed negative results as depicted in the table.

ANTIOXIDANT ANALYSIS

Antioxidants refer as effective in controlling the effect of oxidative damage. Antioxidants are molecules that neutralize the harmful effect of the ROS through the endogenous enzymatic defense system in human body. The extract of stevia leaves taken to antioxidant analysis by appropriate methods showed the total phenol and flavonoids. The total phenol content of stevia leaves extract ranged in 25.3-65.2 mg/g gallic acid equivalent²². In present study, total phenol included in this range. Flavonoids content of stevia leaf extract ranged between 39.8-62.2 mg/g quercetin equivalent. In this study flavonoids included in this range²³. Antioxidants uses shown to influence human health when consumed daily.

CONCLUSION

To summarize the present study evaluated the properties of two extract. The study focused on less described phytoconstituents such as anthraquinone, glycosides, saponin, steroids and sterols. The work concluded that stevia leaves prepared in different solvent contain significant amount of nutrients, phytochemical with antioxidant and might be used as ingredient of food and dietary supplements.

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