



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2018; 6(2): 2231-2233

© 2018 IJCS

Received: 01-01-2018

Accepted: 05-02-2018

Deshmukh NM

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Sawate AR

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Desai GB

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Thorat PP

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Kshirsagar RB

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Patil BM

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Correspondence**Deshmukh NM**

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Studies on proximate and phytochemical properties of *Stevia (Stevia rebaudiana)* leaves powder

Deshmukh NM, Sawate AR, Desai GB, Thorat PP, Kshirsagar RB and Patil BM

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

Introduction

Sweet taste is one of the most popular tastes among humans since birth. Consuming sweet products in different forms is one of the daily nutritional habits all over the world. Over more than 3,000 years, consuming sweet products has had an increasing and different trend, varying from types of sweet fruits and plant secretions and honey to varieties of synthetic sweeteners. Despite of all its advantages as a natural sweetener with its superior performance properties, sucrose is harmful especially for diabetic patients due to its relationship with some health problems such as blood pressure, heart diseases, tooth decay, obesity, increase in blood glucose and insulin levels. On the other hand, because of economic and technological issues, numerous studies have carried out in order to replace sugar with other sweeteners. The World Health Organization [WHO] has estimated that 1 billion people are overweight, 400 million suffer from obesity, and it is expected that this figure will double by 2015. Another problem that the world is faced with is that millions of people are suffering from type 1 and type 2 diabetes. The individuals should avoid consuming high-calorie carbohydrates with high absorption in order adverse complications such as increased blood sugar. There are substitute natural sweeteners for sugar, which are more appropriate choices than refined sugar (Vahedi and Mousazadeh 2016) [1].

The last decade in many parts of the world, there is a growing interest for different food and beverages that improve health benefits. The functional food plays an important role, providing a new type of promising tool with beneficial health effects related to particular components present in the food. Therefore, the addition of sweeteners such as *Stevia* a natural sweetener with a low calorific value and a sweetening power 200-300 times higher than sucrose represents a good alternative as a sucrose substitute (Kumar *et al.*, 2013) [2].

Besides regular consumption of these extracts of *S. rebaudiana* promotes various beneficial effects on certain physiological systems such as cardiovascular and renal, decreases the content of sugar, radionuclides, and cholesterol in blood, improves cell regeneration and blood coagulation, suppresses neoplastic growth, strengthens blood vessels, and had a significant effect as antioxidant. The extracts can be consumed by healthy persons as well as by diabetics. *Stevia* are safe for consumption by diabetics because they do not increase blood glucose levels or insulin resistance (Furlan *et al.*, 2016) [3].

The type 2 diabetes mellitus (DM) is a disease with a globally rising prevalence, mainly due to modern lifestyle with high levels of sugar and fat in the diet. So nowadays, there is an increasing tendency to low caloric foods prepared by high intensity nonnutritive sweeteners. *Stevia* is a zero calorie natural sweetener, which is 250-300 times sweeter than sugar. It is extracted from *Stevia rebaudiana bertonii* leaves, a sweet plant native to Northeastern Paraguay and commercially available in many countries. The sweetness is due to presence of many glycosides in the leaf extract, such as *stevioside* (Narsingrao *et al.*, 2014) [4]. Therefore, concentration amounts of extracted glycosides determine the exact level of sweetness. On the contrary, of artificial sweeteners, *Stevia* not only does not lead to health problems, but also causes several good medicinal effects on the body, including its antidiabetic activity. It is claimed that *Stevia* treats obesity and high blood pressure and has a negligible effect on blood glucose. Moreover, it is safe and there is no evidence for its health risk (Homayouni *et al.*, 2012) [5].

Materials and Methods

Materials

The *Stevia* leaves powder were collected from the Jhanil Healthcare Pvt. Ltd Sunam (Pb). The proposed research was carried out in Department of food engineering, College of Food Technology, VNMKV, Parbhani.

Chemicals and Glasswares

Chemicals

Chemicals (analytical grade) and glasswares required during experiments were used from College of Food Technology, V.N.M.K.V., Parbhani.

Equipments and Machineries

The equipments and machineries hot was used for the present investigation were used from the various departments of College of Food Technology, VNMKV, Parbhani.

Methods

The *stevia* leaves powder was analyzed for proximate like ash, moisture content, crude fiber estimation. Protein estimation was done by macrokjeldhal method, estimation of iron by Wong's method. Calcium analysis was done by titrametric method. Phytochemical analysis was done on aqueous and alcoholic extract. Alkaloid was done by Mayer's test, glycosides done by Brontrager's test. Terpenoids, steroids, tannins, phytosterol were done by Libermannbuchard's test. Flavonoid was done by Shonoda test.

Results and Discussion

Proximate analysis of stevia leaves powder

The proximate analysis of *stevia* powder was done for moisture, crude fat, carbohydrate, protein, crude fiber and ash. The moisture content of *stevia* powder comes out to be (7.2±1.0). Carbohydrate (31.2±1.10), protein (16±0.58), crude fiber (14.83±0.89) and ash (11.9±0.95) content 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 composition. The proximate composition like protein, carbohydrate, fat, crude fibre and ash were measured as per standard method given in AOAC, 1990 [6].

Table 1: Proximate analysis of *stevia* leaves powder

Proximate composition	Concentration % DW
Moisture (g/100g)	7.2±1.0
Crude fat (g/100g)	4.2±0.3
Carbohydrates (g/100g)	31.2±1.10
Protein (g/100g)	16.0±0.58
Crude fiber (g/100g)	14.83±0.89
Ash (g/100g)	11.9±0.95
Minerals	
Iron (mg/100g)	9.0±1.15
Calcium (mg/100g)	18.70±0.20

Minerals Composition

Analyzed minerals composition of *stevia* leaves powder indicated that calcium and iron were found to be 18.70±0.20 and 9.0±1.15 respectively. This further establishes a fact that *stevia* as a mineral loaded ingredient required protecting body, regulating and maintaining the various metabolic process.

Table 2: Proximate analysis of *stevia* leaves powder

Phytochemical analysis of <i>stevia</i> leaves extract		
Phyto-constituents	Water	Ethanol
Anthraquinones	+	+
Cynagenetic glycosides	-	-
Saponins	+	+
Flavonoids	+	-
Glycosides	+	+
Sterols and triter penes	+	+
Steroids	+	+
Tannins	+	-
Terpenoids	+	-

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 disease. The extract subjected to preliminary phytochemical screening using chemical method showed the most abundant compounds in the extract were of tannins followed by saponins, sterols and triter penes, terpenoids, saponins, steroids, glycosides and anthraquinones. Test for cynogenic glycosides, however showed negative results as depicted in the table.

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.

References

- Vahedi H, Mousazadeh M. The effect of using *Stevia* and agave nectar as a substitute for sucrose on physical, chemical, rheological, and sensory properties of dark chocolate. Journal of Scholar Research Library, 2016; 8(15):194-201.
- Kumar R, Bawa AS, Kathiravan T, Nadanasabapathi S. Thermal processing of mango nectar (*Mangifera indica*) and its effect on chemical, microbiological and sensory quality characteristic. International Journal of Advanced Research. 2013; (8)1:261-273.

3. Furlan RL, Baracco Y, Zaritzky N, Campderros ME. Development of free sugar white chocolate, suitable for diabetics, using *Stevia* and sucralose as sweeteners: study of the thermal degradation kinetic. International Journal of Research in Advent Technology. 2016; 4(7):49-57.
4. Narsingrao G, Prabhakarrao P, Balaswamy K, Satyanarayana A. Antioxidant activity of *Stevia* (*Stevia rebaudiana*) leaf powder and A commercial *Stevioside* powder. Journal of Food Pharmaceutical Science. 2014; 2:32-38.
5. Homayouni RA, Delshadian Z, Arefhosseini RS, Alipour B, Jafarabadi MA. Effect of inulin and *Stevia* on some physical properties of chocolate milk. Health Promotion Perspectives. 2012; (2)1:42-47.
6. AOAC. Official Method of Analysis Association of Official Analytical Chemist. 15th Edition. Washington DC, 1990.