



ISSN (E): 2320-3862  
 ISSN (P): 2394-0530  
 NAAS Rating: 3.53  
[www.plantsjournal.com](http://www.plantsjournal.com)  
 JMPS 2020; 8(3): 44-46  
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 Received: 22-03-2020  
 Accepted: 24-04-2020

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## Ethnomedicinal properties of *Stevia rebaudiana* Bertoni

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DOI: <https://doi.org/10.22271/plants.2020.v8.i3a.1131>

### Abstract

*Stevia rebaudiana* Bertoni, a plant from indigenous of Paraguay has low caloric natural sweetening property. It is ~300 times more sweeter than sugar due to presence of several glycosides. Being a non-carbohydrate sweetener, it is being used as food additive. Stevia play many wide range of medicinal properties. This herb is also used in traditional ayurvedic by local people.

**Keywords:** *Stevia rebaudiana*, sweetener, glycosides, medicinal activity

### Introduction

*Stevia* is genus of family Asteraceae which has ~200 species. *Stevia rebaudiana* is one the well identified species of South American plant and indigenous from Paraguay. This is widely cultivated in North America, Asia and Europe (Lemus-Mondaca *et al.* 2012) [12]. *Stevia rebaudiana* also known as sweet herb, sweet leaf, honey leaf, candy leaf and honey yerba (Carakostas *et al.* 2008) [3]. Plant is perennial herb which grow up to height of 2-3 metres. it is cultivated in area where abundant rainfall and warm climate having temperature ranging from 15<sup>0</sup> C-30<sup>0</sup> C. With its woody stem, leaves are arranged opposite which are oval, lanceolate and spatulate. Whitish or violet flowers are five petalled (Chan *et al.* 2000) [4]

Some of the most common species of the genus are with sweetening property are *S. anisostemma*, *S. bertholdii*, *S. crenata*, *S. enigmatica*, *S. eupatoria*, *S. lemmonii*, *S. micrantha*, *S. plummerae*, *S. rebaudiana*, *S. salicifolia*, *S. serrata* and *S. viscida* only *Stevia rebaudiana* is well known. *S. rebaudiana* whose sweetness is ~300 times more sweeter than sugar, with nocaloric properties it is extensively being used as an additive in many food products, which could play a vital role in improvement of human health specially those are suffering from diabetic ((Lemus-Mondaca, Vega-Gálvez, Zura-Bravo, & Kong, 2012) [12]

### Classification

**Table 1:** Classification of *S. rebaudiana*

Kingdon	Plantae
Sub-kingdom	Tracheobionta
Division	Magnoliophyta
Class	Magnoliopsida
Sub-class	Asteridae
Order	Asterales
Family	Asteraceae
Genus	<i>Stevia</i>
Species	<i>rebaudiana</i>



Source: A Garden of Healing Herb

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### Biochemical compounds

The biochemical composition of leaves of plant vary depending upon the type of leaves used (dried or fresh) and method of extraction of the biomolecules. It has been reported that extract of fresh leaves has 19% of proteins, 25% amino acids 31% Carbohydrates and 25% of reducing sugar whereas the extract of dried leaves contains 18% Protein, 10% amino acids 33% of carbohydrates and 33% of reducing sugars which is 8% higher than extract of fresh leaves (Snehal and Madhukar. 2012) [20]. The stevia is potential source for the vitamins and minerals. Major vitamins are known to be present in 100<sup>g</sup> dry mass of leaves are: 14.98 mg of vitamin C, 52.18 mg of folic acid and 0.43 mg of vitamin B2 (Kim *et al.* 2011). K, Mg, S, Na, P, Cu, Co, Fe, Mn, Zn, Se and Mo are most commonly known minerals which was found in the leaves of the Stevia (Boonkaewwan *et al.* 2006 and Kobus-Moryson *et al.* 2014) [2, 11]

### Secondary metabolites

Rebaudioside (A to F), steviolbioside, stevioside and isosteviol are chief Steviol glycoside (Geuns JM. 2003) [5] which are major chemical compound of the *Stevia rebaudiana* which is major source of sweet glycosides (Sehar *et al.* 2008)

[17]. Hydroxyl group C-13 and a carboxyl group at C-19 is crucial for the sweet taste (Kasai *et al.*; 1981) [8]. Other secondary metabolites which are known to be present are alkaloids, cardiac glycosides, tannins, saponins, sterols and triterpenes, reducing compounds and anthraquinones (Tadhani M and Subhash R. 2006) [22]

### Pharmacological attribute

Many chemical compound have been extracted from the leaves of *Stevia*. The plant extract accommodates plenty of bioactive compounds. Antioxidant activity property was found due to presence of polyphenolic and flavonoid compound (Muanda *et al.* 2011, Shukla *et al.* 2009 and Tadhani *et al.* 2007) [16, 19, 21]. Stevioside and its metabolite has also effect on human colon carcinoma cell lines (Boonkaewwan *et al.* 2008) [1] It has been reported that stevioside may enhance insulin secretion which regulates glucose metabolism, leading in reduction of blood pressure and acts as an anti-hyperglycaemic agents (Jeppesen *et al.* 2003) [6]. Plenty of pharmacological activities has been determined in leaves extract of *Stevia*. Following are some of the common and well known attributes:

**Table 2:** List of the medicinal properties of *S.rebaudiana*

Medicinal property	References
Renal protective	Melis MS; 1995 [13]
Antitumor	Mizushima <i>et al.</i> ; 2005 [14]
Antioxidant	Kelmer <i>et al.</i> ; 1985 [9]
Anti-inflammatory	Boonkaewwan <i>et al.</i> ; 2006 [2]
Anti-microbial	Jayaraman, S and Manoharan, M.S; 2008 [7]
Gastroprotective	Shiozaki <i>et al.</i> ; 2006 [18]
Anti-hyperglycaemic	Kelmer <i>et al.</i> ; 1985 [9]

### Conventional applications

Apart from its uses as sweetening agent and anti-diabetic property, *S.rebaudiana* has many other medicinal believes. From hundreds of years people use this plant against many diseases. People of Brazil and Paraguay have been using it leaves as cardio tonic, for obesity. It is also used in helping the lowering of uric acid level. It's also exploited to bring down the hypertension and heartburn. Many tribe applied as toothpaste due to antibacterial activity (Mohire NC and Yadav AV. 2010) [15].

### References

- Boonkaewwan C, Ao M, Toskulkao C, Rao MC. Specific Immunomodulatory and Secretory Activities of Stevioside and Steviol in Intestinal Cells. *J. Agric. Food Chem.* 2008; 56:3777-3784.
- Boonkaewwan C, Toskulkao C, Vongsakul MJ. Anti-inflammatory and immunomodulatory activities of stevioside and its metabolite steviol on THP-1 cells. *J. Agric. Food Chem.* 2006; 54:785-789.
- Carakostas MC, Curry LL, Boileau AC, Brusick DJ. Overview: the history, technical function and safety of rebaudioside A, a naturally occurring steviol glycoside, for use in food and beverages. *Food Chem Toxicol.* 2008; 46:1-10.
- Chan P, Tomlinson B, Chen YJ, Liu JC, Hsieh MH, Cheng JT. A double-blind placebo-controlled study of the effectiveness and tolerability of oral stevioside in human hypertension. *British Journal of Clinical Pharmacology.* 2000; 50(3):215-220.
- Geuns JM. Stevioside. *Phytochemistry.* 2003; 64:913-21.

- Jeppesen PB, Gregersen S, Rolfsen SE, Jepsen M, Colombo M, Agger A *et al.* Antihyperglycemic and blood pressure-reducing effects of stevioside in the diabetic Goto-Kakizaki rat. *Metabolism.* 2003; 52:372-378.
- Jayaraman S, Manoharan MS, Illanchezian S. *In-vitro* Antimicrobial and antitumor activities of *Stevia rebaudiana* (Asteraceae) leaf extracts. *Trop. J. Pharm. Res.* 2008; 7:1143-1149.
- Kasai R, Kaneda N, Tanaka O *et al.* Sweet Diterpene-Glycosides of Leaves of *Stevia rebaudiana* Bertoni-Synthesis and Structure-Sweetness Relationship of Rebaudioside-A, Rebaudioside-D, Rebaudioside-E and Their Related Glycosides. *Nippon Kagaku Kaishi*, 1981, 726-35.
- Kelmer BA, Alvarez M, Brancht A. Effects of *Stevia rebaudiana* natural products on rat liver mitochondria. *Biochem. Pharmacol.* 1985; 34:873-882.
- Kim I, Yang M, Lee O, Nam-Suk K. The antioxidant activity and the bioactive compound content of *Stevia rebaudiana* water extracts. *LWT-Food Sci. Technol.* 2011; 44:1328-1332.
- Kobus-Moryson M, Gramza-Michałowska A, Kobus-Cisowska J, Korczak J. Contents of selected elements in extracts from sweetleaf (*Stevia rebaudiana* Bertoni)]. *Probl. Hig. Epidemiol.* 2014; 95(2):445-448.
- Lemus-Mondaca R, Vega-Gálvez A, Zura-Bravo L, Kong AH. *Stevia rebaudiana* Bertoni, source of a high-potency natural sweetener: A comprehensive review on the biochemical, nutritional and functional aspects. *Food Chemistry.* 2012; 132(3):1121-1132.

13. Melis MS. Chronic administration of aqueous extract of *Stevia rebaudiana* in rats: Renal effects. *J. Ethnopharmacol.* 1995; 47:129-134.
14. Mizushima Y, Akihisa T, Ukiya M, Hamasaki Y, Nakai CM, Kuriyama I *et al.* Structural analysis of isosteviol and related compounds as DNA polymerase and DNA topoisomerase inhibitors. *Life Sci.* 2005; 77:2127-2140.
15. Mohire NC, Yadav AV. Chitosan-based polyherbal toothpaste: As novel oral hygiene product. *Indian J. Dent. Res.* 2010; 21:380-384.
16. Muanda FN, Soulimani R, Diop B, Dicko A. Study on chemical composition and biological activities of essential oil and extracts from *Stevia rebaudiana* Bertoni leaves. *Food Sci. Technol.* 2011; 44:1865-1872.
17. Sehar I, Kaul A, Bani S, Pal HC, Saxena AK. Immune up regulatory response of a non-caloric natural sweetener, stevioside. *Chem Biol Interact.* 2008; 173:115-21.
18. Shiozaki K, Fujii A, Nakano T, Yamaguchi T, Dato M. Inhibitory effects of hot water extract of the *Stevia* stem on the contractile response of the smooth muscle of the guinea pig ileum. *Biosci. Biotechnol. Biochem.* 2006; 70:489-494.
19. Shukla S, Mehta A, Bajpai VK, Shukla S. *In vitro* antioxidant activity and total phenolic content of ethanolic leaf extract of *Stevia rebaudiana* Bert. *Food Chem. Toxicol.* 2009; 47:2338-2343.
20. Snehal P, Madhukar K. Quantitative estimation of biochemical content of various extracts of *Stevia rebaudiana* leaves. *Asian J. Pharm. Clin. Res.* 2012; 5(1):115-117.
21. Tadhani MB, Patelm VH, Subhashm R. *In vitro* antioxidant activities of *Stevia rebaudiana* leaves and callus. *J. Food Compost. Anal.* 2007; 20:323-329.
22. Tadhani M, Subhash R. Preliminary studies on *Stevia rebaudiana* leaves: proximal composition, mineral analysis and phytochemical screening. *J Med. Sci.* 2006; 6:321-326.