



Health Benefits of *Stevia Rebaudiana*-A Review

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ABSTRACT

Stevia rebaudiana leaves contain diterpene glycosides, which have a sweet taste but have no calories in meals. Stevia has been used for generations as a sweetener by the local Guarani Indians of South America to counteract the bitter taste of various medications and beverages. This plant's diterpene glycosides are 100-300 times sweeter than sucrose and are now utilised as sugar substitutes in meals and beverages. They stay stable in food products under a wide variety of temperature and pH conditions throughout processing and have no shelf life constraints. When consumed, these glycosides do not cause a glycemic reaction, making them suitable for diabetics and obese people. Because of its growing diabetic and obese population, India has enormous demand potential for this natural sweetener. Stevia extracts have a high quantity of sweetening chemicals known as steviol glycosides, in addition to medicinal benefits. Along with rebaudioside B, C, D, Dulcoside, and Steviolbioside, the principal sweetening chemicals of importance are (Stevioside and rebaudioside A).

Keywords: *Stevia rebaudiana*; Steviol glycosides; Natural sweeteners



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INTRODUCTION

Stevia, a natural sweetener plant with both medicinal and commercial applications, is utilised all over the world. Stevia's botanical name is *Stevia rebaudiana* Bertoni. It is a perennial shrub in the Compositae (Asteraceae) family. Stevia is native to Paraguay and Brazil, and it is known as the "sweet herb of Paraguay." It is also known as "honey yerba," "honey leaf," and a variety of other names. When cultivated or grown naturally in fertile soil, the mature plant can grow up to 65 cm (26 inches) tall and as tall as 180 cm (72 inches). It is a short day plant and flowering from January to March in the southern hemisphere. It prefers a sandy soil, requiring a warm sunny position. The suitable natural climate is semi humid subtropical with temperature extremes from 21 to 43°C and average 24°C [1]. Stevia grows in areas with up to 1375mm of rain a year. Although plants are not very frost resistant, it can be grown as half-hardy annuals in Britain, starting them off in a greenhouse and planting them out after the last expected frosts. The chronological records show that Stevia leaves have been used for hundreds of years by the Guarani Indians and they named the plant Ka'a He'e The main use was as a sweetener, particularly in their green tea, branded as mate. It was also used in medicine or as a snack. Stevia's leaf is estimated to be 150 to 300 times sweeter than refined sugar. Detail information about Stevia, its botanical aspects, sweet and non-sweet constituents, variations of the naturally occurring sweeteners to improve the taste can be found in the recent excellent book by [2] Kinghorn (2002). Not only the Stevia plant but also its extracts have been used for several years as a sweetener in South America, Asia, Japan, China and in different countries of the EU. In Brazil, Korea and Japan Stevia leaves, Stevioside and highly refined extracts are officially used as a low calorie sweetener [3,4]. Presently in the US, leaf or extracted forms of Stevia is permitted as a dietary supplement. A number of well-known food safety and regulatory agencies from around the world have made their apprehension with stevia based ingredients accurately known for many years [5,-7]. It has also been reported that *S. rebaudiana*, as a non-calorie first natural sweetener used in medicinal green teas for treating heart burn and other ailments [8], even though there are more than 200 species of the genus *Stevia*, only *S. rebaudiana* gives the sweetest essence [9]. Japanese have been using stevia and its products in cooked or baked goods, processed foods and beverages, fruit juices, tobacco products, pastries, chewing gum and sherbets [10]. Stevioside and Rebaudioside of Stevia are stable under wide range of temperatures and pH conditions in different food and pharmaceutical products [11-12]. They do not alter the flavor and taste of a food product in which they are used and are also non-fermentative. Stevia rebaudiana is commercially cultivated in China, Japan, Brazil, Canada, USA, UK, Spain, Belgium, Australia, South Korea, Thailand,

Israel and Taiwan [13-14]. Diterpene glycosides are mostly produced and exported by China and Japan. Stevioside has been permitted for usage in a variety of food products in Japan, including cereals, teas, and soft beverages. Stevia was launched in India in the last decade due to significant demand potentials, particularly given the large diabetic population. Many Indian states, including Rajasthan, Maharashtra, Punjab, Kerala, and Orissa, have successfully grown it. Due to the high demand for natural sweeteners over artificial sweeteners, farmers in India have turned to large-scale Stevia cultivation [15]. We reviewed some significant features of Stevia cultivation, manufacture, and use of zero calorie natural sweeteners in this article.

Plant Profile

Stevia rebaudiana is a subtropical perennial herb, belonging to family Asteraceae. It has annual, subligneous, more or less pubescent stems with extensive, fibrous and filiform root system [1]. The cultivated Stevia plant grows vigorously giving branched bushy shrub like appearance [16]. It grows up to 60-70 cm in height and bears sessile, oppositely arranged lanceolate to oblanceolate leaves with blunt-tipped lamina having serrate margin from the middle to the tip (Fig. 1A). The upper surface of the leaf lamina is slightly glandular. Plant bears small (10-15 mm) white colour pentamerous flowers (Fig. 1B) in capitulum surrounded by green colour involucre bracts. The capitula are arranged in irregular or sympodial cymes. Seed of Stevia is a five-ribbed spindle-shaped achene with feathery pappus (Fig. 1C). Plant is diploid and has 11 chromosome pairs [17].



Fig.1; *Stevia rebaudiana* Plant

Health Benefits

Many plant glycosides have shown activity in cancer prevention, as well as antidiabetic, anti - obesity, antibacterial or antineoplastic effect. *S. rebaudiana* leaves contain noncariogenic and non-caloric sweeteners (steviol glycosides) whose consumption could exert beneficial effects on human health [18]. Stevia glycosides possess valuable biological properties. Regular consumption of these compounds decreases the content of sugar, radionuclides, and cholesterol in the blood [19], improves cell regeneration and blood coagulation, suppresses neoplastic growth and strengthens blood vessels. The toxicology of stevioside has been extensively studied, and related data, reassessed lately, indicated it to be non-toxic, nonmutagenic, and non-carcinogenic. It was also clearly demonstrated that high concentrations of the sweetener rebaudioside A, administered in the diet of rats over 90 days, were not associated with any signs of toxicity [18] and no allergic reaction have been observed when it is used as a sweetener [20]. Stevia is versatile herb with incredible sweetness that can be safely used in herbal medicines; tonics for diabetic patients and also in the daily usage products, Stevia leaves can be used because of its anti - fungal and anti- bacterial property. Mild stevia leaf tea offers excellent relief for an upset stomach. A wet Stevia leaf bag provides a cooling effect on eyes (similar to using cucumber). The leaves effectively tighten the skin and are good for wrinkles. Stevia has proved to give exceptional benefits when used regularly in skin care. It also has a healing effect on blemishes, wounds, cuts and scratches. Low amounts of steviol does not induce cancer (in chronic experiments with rats fed stevioside during 2 years, no increase in tumor formation was found).

CONCLUSION

The demand for greater impact sweeteners is expected to rise globally. The growing number of diabetes patients and health-conscious individuals would increase the need for sugar substitutes. Stevia is a potential substitute for artificial sweeteners such as saccharin, aspartame, and asulfame. Stevioside, unlike many low-calorie sweeteners, is stable at high temperatures and over a pH range of 3 -9. To take advantage of Stevia's inherent sweetness, many steps must be taken. Food manufacturers must begin developing new items that use Stevia. This would certainly increase the demand to grow more, resulting in greater land dedicated to Stevia cultivation. Several significant and necessary initiatives must be made in India to ensure its spread. The first prerequisite would be the development of seedlings suitable for India. An agricultural production system would need to be filled out, including information on optimised crop inputs, weed and disease management, harvesting and handling processes. It is necessary to raise awareness about the natural herb and the products made from it by enterprises. It is time to streamline the forces required to gain access to Stevia. To advertise this natural sweetener and raise product awareness, action must be taken.

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