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## Biochemical and Phytochemical Activity of *Stevia Rebaudiana* by Using Ethanol Extract

Sunitha V<sup>1</sup>, Irene wilsy J<sup>2</sup> and Reginald Appavoo M<sup>3</sup>

Research Scholar<sup>1</sup>, Assistant professor in Botany<sup>2,3</sup>, Department of Botany & Research Centre, Scott Christian College (Autonomous) Nagercoil, Kanyakumari -629 003, Tamilnadu., India

Received: 11-08-2015 / Revised: 29-09-2015 / Accepted: 30-09-2015

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### ABSTRACT

Medicinal plants are to the oldest known health care products that have been used by mankind all over the world in the form of folklore medicines or traditional medicines or ethnic medicines. Even today, plants are the most exclusive sources of drugs for the majority of world's population and plant products constitute about sixty percent of prescribed medicine. The present investigation was carried out to estimate the biochemical and phytochemical constituents present in *Stevia rebaudiana* Bertonii. The results showed the bioactive compounds of carbohydrates, protein, and the activity of amylase enzyme was higher in dry leaves than the fresh leaf. The phytochemical constituents like alkaloids, tannins, flavonoids, glycosides, saponins, triterpenes, phenolic compounds and steroids were present and in catechins, coumarins and xanthoproteins were absent by using ethanol extract.

**Keywords:** *Stevia rebaudiana*, biochemical, Phytochemical

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### INTRODUCTION

Plants are known to have a treasure ground of many kinds of biochemicals which have proved to be a boon for the whole of our mankind. These biochemicals are also referred to as phytochemicals (from the Greek word Phyto, meaning plant), which are biologically active, naturally occurring chemical compounds found in plants [1]. Dietary and health demands are continuing to expand the market for sweeteners in two distinct areas one specifically for the low calorie/dietetic segment, while the other is as an alternative to sugar and other nutritive sweeteners (*i.e.* corn syrup, fructose, glucose) [2]. Recently, there is an increasing demand for low calorie natural sweeteners as a substitute for sucrose and other synthetic sweeteners such as saccharine and aspartame. *Stevia* a perennial plant species commonly called as "sweet herb" is gaining significant importance as a natural sweetener in different parts of the world and is expected to develop into a major source of high potency sweetener for the growing natural food market [3-5]. Steviol glycosides are natural diterpene glycosides extracted from the leaves of *Stevia rebaudiana* Bertonii. (Family-Asteraceae) possessing a 250 - 300 times higher sweetening property than sucrose, and they also used in treatment of patients suffering from carbohydrate

metabolic diseases such as diabetes mellitus, obesity, hyper-tension and stimulates cell regeneration. Thus the steviol glycosides are also widely used in food, beverage, medicine, wine making cosmetics and other food/chemical industry [6-8]. Despite wide therapeutic application of these sweet glycosides, its uses are limited for human consumption (food and pharmaceutical) due to its after taste bitterness, astringency and grassy taste; associated with the presence of some un-known glycosides and other alkaloid impurities [9]. The aim of the present study *Stevia* is a good source of carbohydrate, protein, amylase enzyme and secondary plant compounds (phytochemicals).

### MATERIALS AND METHODS

**Collection of plant material:** The plant materials were collected from the Western Ghats of Cheruvarakkonam.

**Preparation of extracts:** The *Stevia rebaudiana* samples were shade dried for one month and then pulverized into fine powder using a mixer grinder. The extraction was done by soxhlet using ethanol and subjected to qualitative phytochemical screening for the identification of various chemical constituents using the method described by Trease and Evans [10] and by Harbone [11]. The plant

extract were screened for the secondary metabolites such as Glycosides alkaloids, flavonoids, tannins, saponins, triterpenes, steroids, catechin, coumarin, xanthoprotein and phenolic compounds. In this study estimation of total protein (Lowry's method), carbohydrate (Anthrone method) and amylase activity were analysed in both fresh and dry leaf of the plant using ethanol extract.

## RESULT AND DISCUSSION

**Biochemical and Phytochemical analysis:** The preliminary phytochemical analysis of ethanol extract of *S.rebaudiana* revealed the presence of alkaloids, tannins, flavonoids, glycosides, saponins, steroids, triterpenes and phenolic compounds (Table1). The most abundant compounds in the ethanol leaf extract were the glycosides, alkaloids, phenolic compound, and tannins. Flavonoids, steroids and triterpenes were seen in moderate levels, and saponins were seen in least amounts. The test for catechins, coumarins, and xanthoproteins were showed negative result.

The biochemical analysis of fresh leaf in *S. rebaudiana*, the carbohydrate (mg/g) content was  $20.26\pm 0.15$ , Protein  $10.0\pm 0.06$  and amylase enzyme  $1.73\pm 0.15$  respectively. The biochemical analysis of dry leaf in *S. rebaudiana*, the carbohydrate (mg/g) content was  $40.43\pm 0.20$ , Protein  $19.43\pm 0.20$  and amylase enzyme  $4.73\pm 0.05$  respectively. In *S. rebaudiana* dry leaf showed maximum amount of carbohydrate (mg/g), protein, and amylase enzyme than that of fresh leaf (Table 2). In fresh leaves extract the percentage of carbohydrates is higher than the reducing sugars and amino acids and least protein content. In dry leaves extract reducing sugars are present in the highest percentage followed by carbohydrates, proteins and amino acids respectively. The demand of *Stevia* is increasing widely due to its non-caloric nature and usages as natural supplement for sugar. In the present work the concentration of sugars, protein and enzymes were found to be highest in dry leaf extract of *Stevia* as compared to fresh leaf extract it was correlated with Pandae snehal and Khetmalas madhuhar<sup>(12)</sup>.

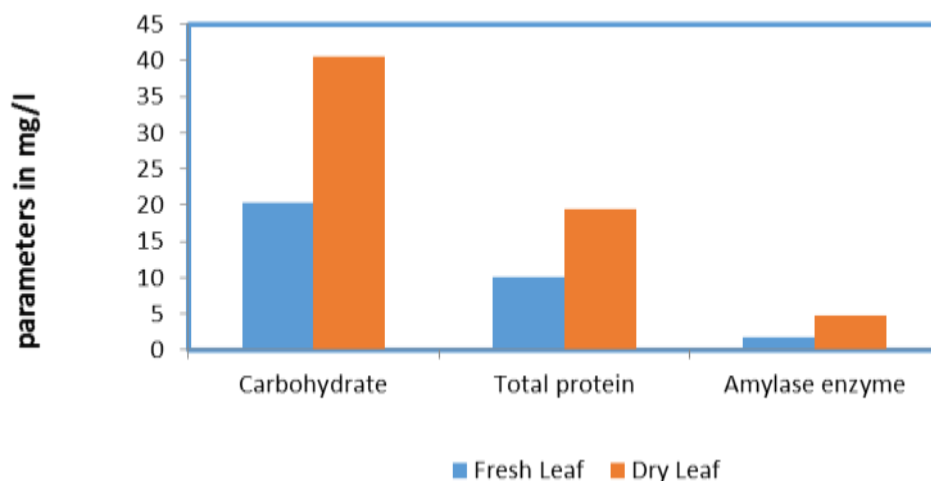
**Table.1 Phytochemical constituents of *Stevia rebaudiana* leaf using ethanol extract**

Phytochemical analysis of compound	Result
Alkaloids	+++
Flavonoids	++
Tannins	+++
Glycosides	+++
Triterpenes	++
Catechin	-
Coumarins	-
Saponins	+
Xanthoproteins	-
Phenolic compounds	+++
Steroids	++

+++ Strongly present; ++ Present;  
+ Weakly present; - Absent

**Table: 2 - Biochemical and enzyme activity of *S.rebaudiana* in fresh and dry leaf.**

No.	Parameters	Fresh leaf (mg/gm)	Dry leaf (mg/gm)
1.	Carbohydrate	$20.26\pm 0.15$	$40.43\pm 0.20$
2.	Total protein	$10.0\pm 0.06$	$19.43\pm 0.20$
3.	Amylase enzyme	$1.73\pm 0.15$	$4.73\pm 0.05$

**Fig :1 Biochemical and enzyme activity of *S. rebaudiana* in fresh and dry leaf**

*Stevia* leaves are good source of carbohydrate (35-62/100g), protein(10-20/100g) and dietary fibre (15-18.5/100g) of dry matter which are important in maintaining of human health. In the present work carbohydrate and protein content of dry matter was similar with the author<sup>(13-16)</sup> *Stevia* leaves extract shows high level of antioxidant activity as well as the variety of phytochemical<sup>(17)</sup>. Therefore *stevia* plant has significant potential for use as a natural antioxidant<sup>(18,19)</sup>.

## CONCLUSION

Phytochemicals which are the major plant constituents, possess many ecological and physiological roles in human health. Plants synthesise a natural compounds in the form of primary and secondary metabolites. The primary metabolites such as carbohydrates, fat, amino acid and proteins play a vital role in growth and developmental process of plants and they benefit to human life too.

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