210/B

Screening of different parts and leaf positions of Stevia rebaudiana (Bertoni) Bertoni for phytochemicals and antioxidant potential

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Stevia rebaudiana (Bertoni) Bertoni (Asteraceae) is a small perennial herb which is widely grown for its sweet leaves and possesses 250-300 times the sweetness of sugar due to the presence of steviol glycosides (mainly stevioside and rebaudioside). Further, it is commonly known as candy leaf, sweet leaf and sugar leaf. Moreover, the sweetening property of stevia is also known for its therapeutic properties including antidiabetic, antimicrobial, antiviral, antifungal, anti-hypertensive, anti-tumour, anti-human rota-virus activities, anti-HIV, hepatoprotective and immune-modulatory effects. However, studies on the presence of therapeutically important active components in stevia are scarce or lacking. Therefore, the present study was undertaken to determine the total phenolic content (TPC), total flavonoid content (TFC) and total antioxidant capacity (TAC) of different parts of the plant and different leaf positions of S. rebaudiana. Leaf fresh weight, dry weight and leaf area at different leaf positions were recorded. The TAC, TPC and TFC were determined using Ferric Reducing Antioxidant Power Assay (FRAP), modified Folin-Ciocalteu colorimetric method and a colorimetric method, respectively. Leaf fresh weight and leaf dry weight increased with maturity. Further, all tested parts demonstrated in increasing order the TPC, TFC and TAC to be leaf>flower>stem> branch > root. TPC, TFC and TAC of different leaf positions revealed that TAC decreased gradually from immature to mature leaf (1^{st} leaf > 2^{nd} leaf > 3^{rd} leaf > 4^{th} leaf > 5^{th} leaf). Further, all tested phytochemicals (TPC, TFC) and TAC were significantly higher in extracts prepared from the first leaf. The results of the present study are important in harvesting and quality control aspects of S. rebaudiana.

Keywords: Stevia rebaudiana, total antioxidant capacity, total flavonoid content, total phenolic content.

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