Codon usage and protein analyses of UDP-Glycosyltransferase in the medicinal plant, Stevia (Stevia Rebaudiana)

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Abstract: Different groups of regulatory elements are involved in the synthesis of rebaudioside A, that is ingredients of sweeteners in medicinal plant like Stevia. One of these regulatory elements is UGT (UDP-glycosyltransferasethat includes; UGT74G1, UGT76G1 and UGT85C2) family that is effective in conversion steviol glycoside to rebaudioside A (1, 2, 3). Several web-based bioinformatics analyses have used to study this gene family. Analyses by Pfam database (5) showed that the protein encoding by these genes contains UDPGT protein protected domain. Basically, the study of secondary structure and three-dimensional structure of these proteins approved high genomic similarity between them. Results of the ProtScale program showed that the frequency of amino acids with negative hydropathicity isvery high in these protein sequences that effectively play role in resistance of the plant to draught stress. Codon usage of medicinal plant by OPTIMIZER database (4) showed that these proteins have high homology with other plants in this family like *CichoriumIntybus*. As Stevia has great role to convert natural sweeteners, It is anticipated that other plants in this family may have similar role in this conversion.

Keywords: UDP-glycosyltransferase; codon usage; Stevia rebaudiana; Cichoriumintybus; medicinal plant

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