



## 甘草 $\beta$ -香树脂醇合成酶编码区SNP与甘草酸含量的相关性研究

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**中文摘要:**目的:探讨甘草 $\beta$ -香树脂醇合成酶( $\beta$ -amyrin synthase,bAS)编码区SNP与甘草酸含量之间的相关性。方法:采用HPLC法测量80株人工栽培甘草的甘草酸含量,采用SAS 9.0软件将80株甘草按照甘草酸含量极显著水平( $P < 0.0001$ )进行分组,采用RT-PCR技术,扩增出甘草bAS编码区序列,运用DNAMAN分析软件找出该序列的SNP位点,进而分析该位点与甘草酸含量高低的相关性。结果:bAS基因编码区共有94、254 bp 2个突变位点,在94 bp位点发生G/A转换,为错义突变,导致该位点处甘氨酸天冬氨酸转换,254 bp处发生C/T转换,为同义突变,根据序列变异将所测样品划分成G-T基因型、A-T基因型、G-C基因型和A/G-C基因型。结论:A-T基因型、G/A-C基因型和G-T基因型和高含量甘草酸形成具有显著的相关性。

**中文关键词:**甘草酸  $\beta$ -香树脂醇合成酶 单核苷酸多态性

### Correlation analysis between single nucleotide polymorphism of $\beta$ -amyrinsynthase and content of glycyrrhizic acid in *Glycyrrhiza uralensis*

**Abstract:**Objective: To analyze the correlation between content of glycyrrhizic acid and the single nucleotide polymorphism of  $\beta$ -amyrin synthase (bAS) in *Glycyrrhiza uralensis*. Method: glycyrrhizic acid content in 80 samples of the cultivated *G. uralensis* were determined by HPLC. According to the very significant level ( $P < 0.0001$ ), 80 samples in accordance with glycyrrhizic acid will be grouped by SAS 9.0. Using RT-PCR strategy to amplification the Open Reading Frame of  $\beta$ -amyrin synthase with the template of total RNA extracted from roots of *G. uralensis* and then using DNAMAN to analyze the relationship between glycyrrhizic acid content and the single nucleotide polymorphism of  $\beta$ -amyrin synthase (bAS). Result: There existed two mutation sites 94 bp and 254 bp, G/A conversion occurred at 94 bp site, which belonged to a missense mutation. G/A conversion led to the corresponding amino acid conversion (Gly  $\rightarrow$  Asp); C/T conversion occurred at 254 bp site, which belonged to a synonymous mutation. According to sequence variation, the samples were divided into four genotypes: G-T genotype, A-T genotype, G/A-C genotype and G-T genotype. Conclusion: A-T genotype, G/A-C genotype and G-T genotype are correlated with the high content of glycyrrhizic acid.

**keywords:** glycyrrhizic acid  $\beta$ -amyrin synthase single nucleotide polymorphism

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