

## Function Study of IrMYB55 in Regulating Synthesis of Terpenoids in *Isodon Rubescens*

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**Abstract :** *Isodon rubescens* is rich in a variety of terpenes such as oridonin. It has important medicinal value. MYB transcription factors are involved in the regulation of plant secondary metabolic pathways. The combined transcriptomics and metabolomics analysis revealed that IrMYB55 might be involved in the regulation of the synthesis of terpenes. The function of IrMYB55 was further verified by establishing of a genetic transformation system by CRISPR/Cas9. Obtaining a virus-mediated *Isodon rubescens* gene silencing material. The main research results are as follows: (1) Screening IrMYB which can regulate the synthesis of terpenes. Metabolomics and transcriptomics analyses of materials with high (TJ)-and low (FL)-content populations which revealed significant differences in terpene content and IrMYB55 expression. Correlation analysis showed that the expression level of IrMYB55 had a significant correlation with the content of terpenes. (2) Establishment of a genetic transformation system of *Isodon rubescens*. The IrPDS gene could be knocked out by injection of *Isodon rubescens* cotyledon, and the transformed material showed obvious albino phenotype. Subsequently, IrMYB55 conversion material was obtained by this method. (3) The IrMYB55 silencing material was obtained. Subcellular localization indicated that IrMYB55 was located in the nucleus, indicating that it might regulate the synthesis of terpenoids through transcription. In summary, IrMYB55 that may regulate the synthesis of oridonin was dug out from the transcriptome and metabolome data. In this study, a genetic transformation system of *Isodon rubescens* was successfully established. Further studies showed that IrMYB55 regulated the transcription level of genes related to the synthesis of terpenoids, thereby promoting the accumulation of oridonin.

**Keywords :** *isodon rubescens*, MYB, oridonin, CRISPR/Cas9

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