Title

The strawberry transcription factor FaWRKY48 transactivates the FaNCED1 promoter as revealed by yeast-one hybrid and Nicotiana benthamiana transfection assays

Abstract

Abscisic acid (ABA) positively regulates strawberry fruit ripening. ABA accumulation is tightly linked with 9-cis-epoxycarotenoid dioxygenase (NCED) expression, a gene that encodes for a key enzyme in the ABA synthesis pathway. In turn, WRKY transcription factors have been reported as one of the activators of NCED transcription in Arabidopsis, but no information about the regulation of NCED expression in strawberry has been reported. Therefore, we analyzed the transcriptional profiles of three WRKY and NCED genes at different developmental stages of strawberry fruit. FaNCED1 and FaWRKY48 showed the highest gene expression according to the advance of ripening. WRKY-recognition cis-elements (W-box) were found in the FaNCED1 promoter sequence and the FaWRKY48 binding to the FaNCED1 promoter was demonstrated by yeast one-hybrid (Y1H) and in vivo transactivation assays. Agroinfiltration of Nicotiana benthamiana leaves with FaWRKY48 and FaNCED1 promoter constructs showed an increment in GUS activity, suggesting that FaWRKY48 could regulate FaNCED1 transcription. Our study is an approach to elucidate one of the molecular triggers of ABA biosynthesis in strawberry.

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