

Papaya CpMADS4 and CpNAC3 co-operatively regulate ethylene signal genes *CpERF9* and *CpEIL5* during fruit ripening

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Abstract

MADS box transcription factors (TFs) play important roles in different biological processes, for example, fruit ripening. However, the roles of MADS box TFs in papaya fruit ripening remain a little known. In this study, a novel MADS-box gene was found, named as *CpMADS4*, and its expression level was decreased during fruit ripening. Protein-protein interaction assays proved that *CpMADS4* interacted with *CpNAC3*. Both *CpMADS4* and *CpNAC3* had transcriptional activation activities. Moreover, *CpMADS4* and *CpNAC3* could specifically bind to and activate the promoters of ethylene signal genes *CpERF9* and *CpEIL5*, and the activate activities would be enhanced when both *CpMADS4* and *CpNAC3* existed at the same time. Our results suggested that *CpMADS4* might function in fruit ripening through interacting with *CpNAC3* and regulating ethylene signal genes *CpERF9* and *CpEIL5*, which provided new views about the functions of papaya MADS box TFs in regulating fruit ripening.