The basic helix-loop-helix transcription factor MabHLH7 positively regulates cell wall-modifying-related genes during banana fruit ripening

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Abstract

The basic helix-loop-helix (bHLH) family proteins, a group of functionally diverse transcription factors (TFs), control a series of plant biological processes. However, the involvement of bHLH TFs in fruit ripening still rarely reported. In this study, a banana fruit bHLH TF, named as MabHLH7, was identified and characterized. MabHLH7 was ethylene-inducible and nuclear-localized, and its transcript level was increased during banana fruit ripening. More importantly, MabHLH7 can directly bind to and activate the promoters of several cell wall-modifying-related genes, including *MaXTH12*, *MaEXP2/21*, *MaPME4/5*, *MaPG4,* and *MaPL1/2,* which were significantly enhanced in the ripening stage. Overall, our findings establish a transcriptional regulatory network during banana fruit ripening, in which MabHLH7 activates a small subset of cell wall-modifying-related genes through directly binding to their promoters.