Title Characterization of ADP-ribosylation factor gene differentially expressed during postharvest banana (*Musa accuminata* L. AAA)

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Abstract

ADP-ribosylation factors (Arf), a family of small GTP-binding proteins, play important roles in intracellular trafficking in plant cells. A homolog of Arf was isolated by screening cDNA library from postharvest banana (*Musa accuminata* L. AAA group) fruit and was designated as Ma-Arf1 for the reason of the first Arf homolog isolated from banana. Sequence analysis shows that Ma-ARF1 is highly conserved compared with ARF proteins from other plants. Very high similarity is found to those from rice (OsArf), alfalfa (MtArf), potato (StArf), wheat (TaArf) and Arabidopsis (AtArf1) with more than 95% identity. Several conserved motifs, which are present in ARF proteins, are also observed in deduced amino acid sequence of Ma-Arf1. Three consensus sequences proposed to be involved in GTP binding are present at amino acid positions 24 - 31 (sequence GLDAAGKT, Gl motif of ARF protein), 67 - 71 (sequence DVGGQ, G3 motif DXXGQ), and 126 - 129 (sequence NKQDL, G2 motif NKXD). Reverse-transcription PCR (RT-PCR) was used to identify the expression patterns of Ma-Arf1 in different organs of banana. The results indicate that Ma-Arf1 expresses in all organs examined, comparably high expression level occurring in fruit. Transient expression of Ma-Arf1-GFP fusion protein shows that Ma-ARF1 is localized in both the cytoplasm and cytomembrane. To explore the transcriptional regulation of Ma-Arf1 in postharvest ripening banana, real time RT-PCR was used. Differential expression of Ma-Arf1 is induced by ripening. Furthermore Ma-Arf1 is induced not only by ethylene biosynthesis during ripening but also by exogenous ethylene. The information obtained in our study provides new insight into mechanism of postharvest banana ripening in terms of intracellular trafficking.