Title Cloning of an ADP-ribosylation factor gene from banana (*Musa acuminata*) and its expression patterns in postharvest ripeningfruit

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Abstract

A full-length cDNA encoding an ADP-ribosylation factor (ARF) from banana (*Musa acuminata*) fruit was cloned and named *MaArf*. It contains an open reading frame encoding a 181-amino-acid polypeptide. Sequence analysis showed that MaArf shared high similarity with ARF of other plant species. The genomic sequence of *MaArf* was also obtained using polymerase chain reaction (PCR). Sequence analysis showed that *MaArf* was a split gene containing five exons and four introns in genomic DNA. Reverse-transcriptase PCR was used to analyze the spatial expression of *MaArf*. The results showed that *MaArf* was expressed in all the organs examined: root, rhizome, leaf, flower and fruit. Real-time quantitative PCR was used to explore expression patterns of *MaArf* in postharvest banana. There was differential expression of *MaArf* associated with ethylenebiosynthesis. In naturally ripened banana, expression of *MaArf* was in accordance with ethylenebiosynthesis. However, in 1-methylcyclopropene-treated banana, the expression of *MaArf* was inhibited and changed little. When treated with ethylene, *MaArf* expression in bananafruit significantly increased in accordance with ethylenebiosynthesis; the peak of *MaArf* was 3 d after harvest, 11 d earlier than for naturally ripened bananafruits. These results suggest that *MaArf* is induced by ethylene in regulating postharvest bananaripening. Finally, subcellular localization assays showed the MaArf protein in the cytoplasm.