

Title A MYB transcription factor regulates anthocyanin biosynthesis in mangosteen (*Garcinia mangostana* L.) fruit during ripening

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Abstract

Mangosteen (*Garcinia mangostana* L.) fruit undergo rapid red colour development, both on the tree and after harvest, resulting in high anthocyanin production in the pericarp. Here, we report the isolation of three full-length mangosteen MYB transcription factors (*GmMYB1*, *GmMYB7* and *GmMYB10*) and all the anthocyanin biosynthetic pathway genes (*GmPal* to *GmUFGT*). Phylogenetic analysis at the protein level of the R2R3-MYB transcription factor family showed *GmMYB10* had a high degree of similarity with production of anthocyanin pigment1 in *Arabidopsis* and as well as sequences from other plant species related to the elevation of anthocyanin pigmentation. In transient transactivation assays, *GmMYB10*, co-expressed with *AtbHLH2*, strongly activated the *GmDFR* and *AtDFR* promoters. Transcripts of *GmMYB10* and *GmUFGT* were highly abundant with onset of pigmentation and subsequently during red colouration. Our results suggest that *GmMYB10* plays an important role in regulating anthocyanin biosynthesis both on the tree and after harvest, while *GmUFGT* may be a key biosynthetic gene in mangosteen pigmentation. The expression patterns of *GmMYB10* and *GmUFGT* correlated with ethylene production that increased linearly until stage 5 (dark purple) and decreased thereafter. 1-Methycyclopropene (1-MCP) clearly delayed red colouration with resulting down-regulation of *GmMYB10*. These results suggest that the effect of ethylene on anthocyanin biosynthesis may be via the regulation of *GmMYB10* expression.

<http://www.springerlink.com/content/b041664335221645/fulltext.pdf>