

**Title** Low temperature controls red colouration of mangosteen fruit by down-regulating *GmMYB* expression

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### Abstract

Temperature controls anthocyanin biosynthesis in many plants. Mangosteen (*Garcinia mangostana* L.) is a widely grown fruit crop which can benefit from low temperature storage. However, low postharvest temperatures can affect the development of the important red pigmentation of the fruit. We therefore have studied the effects of low temperature on anthocyanin biosynthesis in mangosteen fruit. Fruit were stored at 25°C (control) and 15°C for 7 days then transferred to 25°C. The results show that the low temperature clearly inhibited development of red colouration and anthocyanin pigmentation. After transfer of the fruit from 15°C to 25°C, red colouration and anthocyanin contents increased significantly. Storage at 15°C inhibited the transcript levels of *GmMYBs*, transcription factors important in regulating the anthocyanin synthesis pathway, and all anthocyanin biosynthetic genes. Transcript levels increased in abundance when the fruit were transferred to 25°C. Transcript levels of *GmMYB10* were particularly high when transferred to 25°C. Low temperature storage (15°C) possibly delayed red colouration through down-regulation of *GmMYB10*. These results suggest that low temperature-inhibited anthocyanin biosynthesis may be via the regulation of a MYB transcription factor.