

Identification of factors involved in carotenoid metabolism in durian (*Durio zibethinus*) pulp

Kittiya Tantisuwanichkul¹, Supaart Sirikantaramas^{1,*}

¹ Molecular Crop Research Unit, Department of Biochemistry, Faculty of Science, Chulalongkorn University; Kittiya.tanti@gmail.com

* Correspondence: supaart.s@chula.ac.th; Tel.: +662-218-5425

Abstract: Durian (*Durio zibethinus* L.) is known as 'the King of Fruits'. In Thailand, various durian cultivars such as Katheoi-Nueakhao (KT), Monthong (M), Chanee (C) and Phuangmanee (P) exhibit pale- to deep-yellow color in their fruit pulps, respectively. Previous study reported a positive correlation between yellow color intensity and carotenoid accumulation in a pulp during fruit developmental stages. However, our expression analysis of carotenoid biosynthetic genes by qRT-PCR in these four cultivars shows positive correlation between gene expression profiles and yellow color intensities in those pulps except in P. Therefore, we suggest that the difference in yellow color intensity among different durian cultivars is possibly linked to other factors including carotenoid degradation and precursor availability. Accordingly, we measured transcript levels of carotenoid-degrading genes in the four cultivars. However, we did not find any strong correlation between the expression levels and color intensities. Interestingly, *DzNCED5* which involved in Absciscic acid (ABA) biosynthesis and indirectly involved in fruit ripening, shows dramatically increased expression level during ripening process in all cultivars. Then we cloned this gene from four cultivars and characterized its function in *N. benthamiana*. An increased ABA content in all four transiently expressed plants was found. This result confirmed that the function of *DzNCED5* related to ABA biosynthesis. However, the involvement of this gene in fruit ripening is still unclear. Further investigation is needed to understand the function of *DzNCED5* and to unravel other possible factors which might control yellow color intensity of fruit pulps among durian cultivars.

Keywords: durian; carotenoid; synthesis; degradation



Copyright: © 2021 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Funding: This research was funded by the Royal Golden Jubilee Ph.D. program, Thailand Research Fund, and the Chulalongkorn University Graduate Scholarship to Commemorate the 72nd Anniversary of His Majesty King Bhumibol Adulyadej.

Acknowledgments: We wish to acknowledge Molecular Crop Research Unit, Department of Biochemistry, Faculty of Science, Chulalongkorn University.