TREE AGE AFFECTS THE VOLATILE COMPOUND PROFILE OF MUSANG KING DURIAN FRUIT

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Musang King durian (MK) is a seasonal tropical fruit widely cultivated in Southeast Asia. It is known for its sweet, strong, and pervasive aroma. Tree age is one of the important factors affecting the eating quality parameters of durian fruits. Parameters such as volatile compounds (VOCs) play a significant role in determining the fruit's aroma and flavour. This study investigated the impact of tree age on the VOC profile of Musang King (MK) durian fruit using headspace solid-phase microextraction gas chromatography high-resolution mass spectrometry (HS-SPME-GC-orbitrap-HRMS). The analysis revealed significant variations in VOC profiles across different tree age groups. Partial least squares discriminant analysis (PLS-DA) based on variable importance in projection (VIP) have identified several key compounds with higher concentrations in fruits from young trees, including benzene, 1-ethyl-3,5-dimethyl, benzene, 1-methyl ethyl, and 1-hydroxy-2-butanone. Conversely, fruits from older trees exhibited higher concentrations of n-caproic acid vinyl ester, 4-ethyl-5-methylthiazole, propanoic acid, 3-(ethylthio)-, oxirane-methanol, propyl pyruvate, disulfide, ethyl 1-methylethyl, 1,3-oxathiolane, and propanoic acid, 2-methyl-, propyl ester, which were identified as influential marker compounds. Moreover, total sulfur compound concentration were significantly higher in fruits from middle- and old-aged trees while esters, aldehydes, and ketones were higher in fruits from younger trees. These findings suggest that tree age significantly impacts the VOC composition of MK durian and these variations can potentially respond to its aroma perception. Conclusively, VOCs can be used as a tool to differentiate and authenticate MK durian fruits from different tree ages.

Keywords: Aroma; *Durio zibethinus*; Influential markers; Musang King; Volatile compound profiling;