

Authentication of Shallots from Brebes using Gas Chromatography Fingerprinting Technique Combined with Chemometrics

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First Author	
Last Author	
Authors	Pradina, YS; Puteri, A; Rachma, GF; Balqis, N; Anggraini, GP; Wasito, H;
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Abstract	<p>Shallots from Brebes, also called Bima Brebes, have a more pungent aroma compared to other varieties. Its high demand results in increased prices in the market, leading to frequent cases of fraud wherein Bima Brebes shallots are replaced with other types of shallots. This study aimed to develop an analytical method using gas chromatography-flame ionization detector (GC-FID) fingerprinting combined with chemometrics to authenticate Bima Brebes shallots. Essential oils were extracted through ultrasonic hydrodistillation, followed by organoleptic, refractive index, GC-FID fingerprinting and chemometric analysis. The yield value of the five studied shallot varieties ranged from 0.02% to 0.08% w/w. Meanwhile, the organoleptic tests and refractive index values showed minimal differences among the five varieties. The GC-FID analysis revealed approximately 149 chromatogram peaks, and chemometric analysis, including principal component analysis, partial least squares-discriminant analysis, and hierarchical cluster analysis, was used to group and differentiate the chromatogram profiles of the five shallot varieties based on their types. Therefore, this method can be used as an alternative analysis technique for authenticating Bima Brebes shallots.</p>
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Author	Dr.nat.techn. apt. HENDRI WASITO, S.Farm, M.Sc.