

## Classification of different pineapple varieties grown in Malaysia based on volatile fingerprinting and sensory analysis

### ABSTRACT

**Background:** Pineapple is highly relished for its attractive sweet flavour and it is widely consumed in both fresh and canned forms. Pineapple flavour is a blend of a number of volatile and non-volatile compounds that are present in small amounts and in complex mixtures. The aroma compounds composition may be used for purposes of quality control as well as for authentication and classification of pineapple varieties.

**Results:** The key volatile compounds and aroma profile of six pineapple varieties grown in Malaysia were investigated by gas chromatography–olfactometry (GC-O), gas-chromatography–mass spectrometry and qualitative descriptive sensory analysis. A total of 59 compounds were determined by GC-O and aroma extract dilution analysis. Among these compounds, methyl-2-methylbutanoate, methyl hexanoate, methyl-3-(methylthiol)-propanoate, methyl octanoate, 2,5-dimethyl-4-methoxy-3(2H)-furanone,  $\delta$ -octalactone, 2-methoxy-4-vinyl phenol, and  $\delta$ -undecalactone contributed greatly to the aroma quality of the pineapple varieties, due to their high flavour dilution factor. The aroma of the pineapples was described by seven sensory terms as sweet, floral, fruity, fresh, green, woody and apple-like.

**Conclusion:** Inter-relationship between the aroma-active compounds and the pineapples revealed that ‘Moris’ and ‘MD2’ covaried majorly with the fruity esters, and the other varieties correlated with lesser numbers of the fruity esters. Hierarchical cluster analysis (HCA) was used to establish similarities among the pineapples and the results revealed three main groups of pineapples.

**Keyword:** Pineapple varieties; Volatile fingerprinting; PCA; HCA; Sensory evaluation; GC-O