

Title Examination of volatile patterns of fruit and vegetables using a non-targeted analysis approach
Authors D. Ulrich, T. Nothnagel, K. Olbricht
Citation ISHS Acta Horticulturae 804:659-662. 2008.
Keywords rapid method; non-targeted analysis; *Fragaria x ananassa*; SPME; GC

Abstract

Most of the volatile patterns of fruit and vegetables comprise hundreds of substances. The interactions of biochemical pathways of plant volatiles (PV) are complex and until now not completely understood. Therefore during cultivation and postharvest processes unexpected changes of the PV pattern occur. Normally the common targeted approach for analysing plant PV using GC with identification/ calibration tables comprises only a couple of substances. Important volatiles which can influence the quality (flavour, off-flavour, spoilage...) of a product may be overlooked using this approach. A reliable non-targeted analysis method was applied to examine the PV patterns of strawberries and carrots. The analysis complex consists of a rapid sample preparation method to isolate the volatiles (headspace solid phase microextraction or stir bar sorptive extraction), gas chromatography with FI- or MS-detectors, data processing by pattern recognition and multivariate statistical analysis of data. Up to 200 distinct peaks can be controlled during cultivation, postharvest or metabolomic experiments. The effort to identify substances by GC-MS can be focused on interesting differences in volatile patterns. The applied approach, especially using standard GC detectors like FID, is reliable, rapid and prevents overlooking of unexpected substances. The non-targeted analysis method is demonstrated using a population of 200 strawberry clones as samples.