

APPLICATION OF HS-SPME-GC-MS TO EVALUATE THE POSSIBLE INFLUENCE OF ALTITUDE ON APPLE FLAVOR

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About 15% of the apples produced in the European Union come from Trentino Alto Adige (Northern Italy) (~1.7 Mtons in 2014). Many orchards, within this region are located between 500 and 1000 meters a.s.l. Among the different pre- and post- harvest factors affecting apple fruit quality, altitude is one of the most important, determining differences in physiological mechanisms of fruit growth, ripening stage and chemical composition [1].

Golden Delicious apples were harvested in six different orchards located in Val Venosta (Alto Adige) at different altitude levels (from 600 to 1000 m a.s.l.) and analyzed after 5 months of controlled atmosphere storage.

Here, we present the application of HS-SPME-GC-MS to characterize the volatile compounds emitted by these apples to verify the possible effect of altitude on apple flavor. Analytical data are complemented with sensory evaluation of the same samples by trained assessors [2].

Sample preparation and volatile compounds analysis have been described in a previous work [3]. Volatile compounds were adsorbed on a DVB/CAR/PDMS SPME fiber and analyzed with a GC-MS system (GC Clarus 500, PerkinElmer, Norwalk CT) equipped with on a HP-Innowax fused-silica capillary column (30 m, 0.32 mm ID, 0.5µm film thickness; Agilent Technologies, Palo Alto, CA, USA).

Eighty volatile compounds have been fully or tentatively identified. In general apples harvested at higher altitude emit more volatile compounds. Preliminary data analysis reveals that, among the other compounds, 2-methyl-2-butenal, propyl-2-methyl butanoate and 3-(methylthio)-1-propanol are statistically more abundant in the headspace of apples grown at higher altitude. These data will be compared with results from sensory analysis.

REFERENCES

[1] Corollaro M.L. et al., Journal of the American Pomological Society 68 (2014) 141.

[2] Corollaro M.L. et al., in preparation

[3] Aprea E. et al., Food Research International 49 (2012) 677.