

Nuclear magnetic resonance spectroscopy-based classification of high taste quality tomatoes from Almería.

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In this work, a NMR study of the metabolite profiling of four varieties of tomatoes (raf, rambo, zayno, and 74-6006) representative of cultivars from Almería has been accomplished. Plants were grown under controlled conditions in a greenhouse. NMR spectra were measured on a HR-MAS probe (^1H frequency of 500 MHz). Samples were prepared simply by charging the rotor with 50 μL of a mixture of tomato purée in phosphate buffer solution prepared in D_2O .¹ The strong water signal was suppressed by using a NOESY presaturation scheme.

For the tomato variety zayno, skin, flesh, and seeds were analyzed separately. Significant variations in the metabolite profile were observed. For instance, seeds are characterized by a high content of saturated and unsaturated fatty acids, while skin shows a high concentration of amino acids (Figure 1).

Signal intensities corresponding to major metabolites present in tomato were used for performing the multivariate statistical analyses.² Principal component analysis results showed a high dispersion of the observations within the same group due to sample heterogeneity. However, two groups can be clearly distinguish on the PC1 (Figure 2) with the signal of citric acid as the major responsible for this separation (coefficient of 0.92). Linear discriminate analysis and classification tree methodologies were also carried out and suitable models for the classification of tomatoes according to their variety were found.

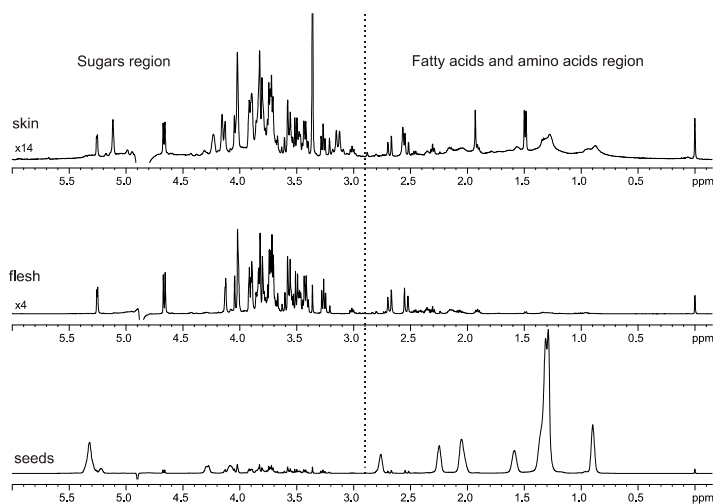


Figure 1. Expansion of ^1H HRMAS NMR spectra of seeds, flesh and skin samples of tomato zayno.

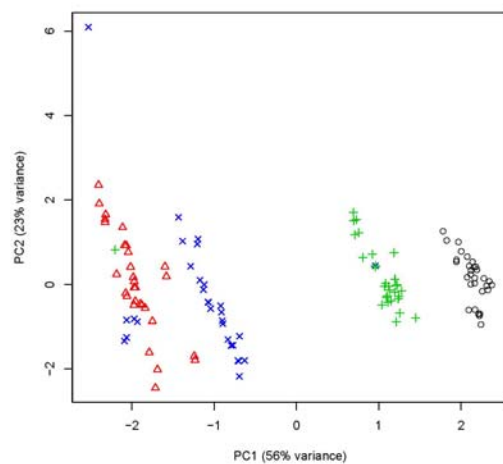


Figure 2. Projections of samples replicates of the four groups on the PC1 vs. PC2 plane. Δ : raf; \times : zayno; $+$: rambo; \circ : 74-6006.

1. Shintu, L.; Ziarelli, F.; Caldarelli, S. *Magn. Reson. Chem.* **2004**, *42*, 396.
2. Colquhoun, I. J. *J. Pestic. Sci.* **2007**, *32*, 200.

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