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Quantitative 1D and 2D ¹H-NMR Analysis of Taste Compounds from Raw and Fried Tissues of *Allium cepa* L. Investigation of Aqueous Solutions Made from these Tissues.

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Onions dice are frequently used in culinary preparation; they contribute both the flavour of dishes (including sauces), i.e. mostly aqueous solutions. In order to investigate the taste of aqueous solutions raw and thermally processed (fried) onions (*Allium cepa* L.) and to understand the mechanisms of extraction of taste compounds, quantitative (q) one-dimensional (1D) proton (¹H) nuclear magnetic resonance (NMR) spectroscopy was used

¹H-NMR spectroscopy was applied to samples prepared by lyophilization of soaking solutions and of ground non-processed of processed plant tissues. The solid content was redissolved in D₂O, lyophilized again, and redissolved in D₂O with pH adjustment (Duarte *et al.*, 2002). By q NMR, metabolic fingerprints of a complex mixture are obtained.

The first part of our work was the identification of the different main taste molecules in onions samples (raw and fried) and in aqueous solutions obtained by soaking these samples at room temperature. 1D and two-dimensional (2D) ¹H-NMR spectroscopy showed that the main taste molecules are sugars (glucose, fructose, sucrose and fructooligosaccharides), amino acids (alanine, arginine, asparagine, glycine, glutamine, histidine, isoleucine, leucine, lysine, phenylalanine, threonine, tyrosine and valine), organic acids (malic acid, aspartic acid and glutamic acid). New peaks (to be identified) appear in the sugar region after long time storage.

The second part of the work was the quantification of glucose, fructose and sucrose, using 3-(trimethylsilyl)propionic-2,2,3,3-d₄ acid sodium salt (TSP) for chemical shift calibration and for quantification of absolute concentrations of metabolites with calibration curves of C1H- α glucose and (C3H, C4H)- β + C3H- α fructofuranose and C1H (Glc) sucrose. Different integration methods were tested.