

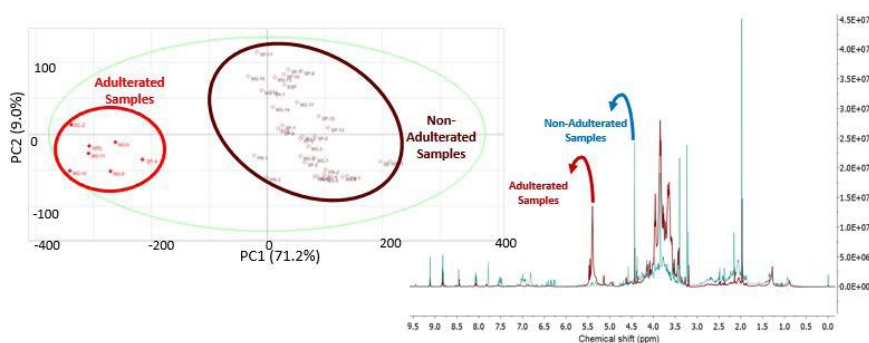
NMR-Based Methodology for Roasted Coffee Adulteration

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NMR has been proved a robust and versatile technique to determine different types of food adulteration, including one of the most studied and valuable commodities: coffee. Coffee brings several benefits to human health and due to its high value unfortunately, it is frequently adulterated. For example, low-value grains such as corn, rice, soy and barley are normally found in adulterated coffee samples. In Brazil, the main producer and exporter of coffee beans, there is a limit of “different substances” that is tolerated in commercial coffee brands which corresponds to 1% of the mass of “adulterant” in relation to the total mass of roasted coffee. Due to its versatility, NMR has been proved an ideal tool to determine and quantify coffee adulteration at the lowest level permitted by Brazilian law. Along with chemo metric tools (with the appropriate processing), NMR data allow us to perfectly see the separation between pure and adulterated samples (as shown in the figure below). With the present work, it is possible to easily determine if a commercial sample is adulterated or not with a reliable methodology. The developed NMR-based methodology does not use harmful solvents and only uses deuterium oxide and centrifugation to prepare the samples to NMR analysis. Lastly, it allows us to determine surely the adulteration percentage in a coffee sample only with data processing.



Biography:

Maria Izabel Milani has an academic background in Analytical Chemistry. She did her undergraduate and master's degree at Institute of Chemistry of the São Paulo State University - UNESP. She is a doctoral student in the graduate program in chemistry at the same institute and the subject of her PhD research is the authentication of samples of roasted coffee and coffee oil under the supervisor of Prof. H. R. Pezza and co-supervisor of Prof. Toci. Ms. Milani has several papers published in international journals derived from her graduate research and in collaboration with her colleagues.