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Identification of food borne bacteria using mid infrared spectroscopy

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The accurate and reliable detection and identification of microorganisms in food is critical to public safety as the microbial growth and metabolism in foods can result in deterioration conducting to the development of unacceptable off-flavours, discoloration or slime production and most important of all can cause food borne diseases. It is extremely important to develop rapid and inexpensive methods for the detection of food microorganisms to replace traditional analysis methods that are expensive and time consuming. Mid-infrared spectroscopy (MIR) is a powerful, inexpensive and fast tool for food quality analysis and control being one of the most promising techniques for the food industry. It has been successfully used to study microorganisms since each bacterial species has a complex cell membrane/wall composition which gives a unique spectral fingerprint. The analytical information of the spectra can be interpreted using multivariate analysis relating the spectra obtained with the properties of the object of study. The aim of this work was to develop a rapid method to identify bacteria isolated from food samples in order to replace the traditional microbiological methods. Multivariate techniques were applied in order to assess the feasibility of using this approach to address the problem of bacterial identification. We concluded that MIR spectroscopy and multivariate analysis are effective and rapid methods that allow the identification of bacteria. This could be of paramount importance to the food industry allowing the microbial analysis of food samples within a time range that is worth and useful to decide of their suitability for consumption.

Biography

Adelaide Almeida is an Assistant Professor at the Department of Biology from the University of Aveiro (Portugal), where she got her PhD degree in 2001. She is an Integrated Member of the Associated Laboratory Centre for Environmental and Marine Sciences (CESAM). In the previous years, she was involved in the development and application of alternative methods to the use of antibiotics such as photo dynamic therapy and phage therapy and has publications in these fields.

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