

### Mass spectrometry for authentication of food products

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Mass spectrometry is an important analytical tool to authenticate the geographical origin of various food products. This is particularly important in the present world-scenario of free trade agreement, terrorism, and to identify the fraudulent approaches for money profits. A number of mass spectrometric techniques, e.g. thermal ionization mass spectrometry (TIMS), inductively coupled plasma source mass spectrometry (ICPMS), stable isotope ratio mass spectrometry (SIRMS), etc. are being increasingly employed to fulfill the objective of geographical authentication. The precise and accurate data on the isotopic composition of some of the elements viz., B, Sr, Pb, C, O, etc.; concentrations of trace elements in the food product and the soil; and the chemometric analysis (e.g. principal component analysis PCA) of the data provide valuable tools. Though fully automated

mass spectrometers are commercially available these days, yet the high precision and accuracy required for the isotope ratios demands a skilled analytical scientist with critical evaluation of the various parameters affecting the precision and accuracy of the analytical data. Examples will be shown of various parameters which need be carefully examined to get meaningful data. A number of studies are reported in literature on different food products. This presentation will summarize the internationally reported results on a few food products (rice, coffee, tea. etc.) and discuss the results obtained on tea leaves and rice grown within India. The talk will also highlight the future requirements to satisfy the various objectives of food authentication.

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