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Validation of a tandem mass spectrometric method for direct analysis of free amino acids in riceG V V Liyanaarachchi¹, H P P S Somasiri¹, K R R Mahanama² and P A N Punyasiri²¹Industrial Technology Institute, Sri Lanka²University of Colombo, Sri Lanka

The role of Free Amino Acids (FAAs) in deciding the organoleptic characteristics of food has inspired growing concern in researching on FAA levels present in food. With this apparent relationship of FAAs to taste which are present in minute quantities, there is an increased demand for analytical methods sensitive in trace level detection. This study presents the validation results of the method developed for direct, un-derivatized analysis of FAAs in rice using Liquid Chromatography-tandem Mass Spectrometry (LC-MS/MS). Satisfactory chromatographic resolution of 20 FAAs was achieved using LC-MS/MS detection in Electrospray Ionization (ESI) mode. Selectivity of the method was assured considering the qualifier to quantifier ratio. The detection and quantification limits were in the range 0.4-1.0 mg/kg and 0.6-1.2 mg/kg respectively. Method had a wide linear range over 1.25-100 mg/kg range with regression coefficients greater than 0.999 obtained over seven calibration levels. Precision measured in terms of repeatability and reproducibility, expressed as percentage relative standard deviation (%RSD) was below 10% for all the amino acids analyzed. Recoveries obtained for samples fortified at three concentration levels covering the working range of the method were in the range of 80-110%. Measurement uncertainties of the studied analytes with the coverage factor ($k=2$), were below 14% and the method was found robust over other grains including corn, wheat, finger millet and black gram. The developed LC-MS/MS method is reproducible and accurate, allowing determination of un-derivatized FAAs in rice and comply with the international method validation guideline requirements available for trace level analysis.

Biography

G V V Liyanaarachchi has completed his PhD in Analytical Chemistry from the University of Colombo in Sri Lanka. He serves as a Consultant and as a Technical Expert for national and international committees and organizations and has won several awards in recognition of his work. He has over 22 publications/communications published in reputed journals together with two patents and currently serves as a Senior Deputy Director at the Chemical and Microbiological Laboratory of Industrial Technology Institute (ITI) of Sri Lanka.

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