OMICS Group Conferences
Accelerating Scientific Discovery

International Conference on
Omics Studies

September 4-6, 2013 Holiday Inn, Orlando-FL, USA

Matrix-assisted laser desorption/ionization mass spectrometry in plant metabolomics

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Abstract

Different analytical approaches have been employed for the analysis of plants metabolites. Though to our best knowledge, no studies have been performed using matrix-assisted laser desorption/ionization mass spectrometry (MALDI-MS) in plant metabolomics. Compared to other metabolomics techniques, MALDI-MS shows several advantages. As a first attempt in applying MALDI-MS in plant metabolomics extracts of *Lychnophora salicifolia* have been analyzed by MALDI-MS. Data were subsequently evaluated by multivariate statistical methods. This specie is used in Brazilian folk medicine as analgesic and anti-inflammatory agent and showed serious problems with correct botanical identification. As they are used in folk medicine, their correct identification and taxonomic classification is of major importance. Metabolomics by MALDI-MS could assist in correct taxonomic classification of species of this genus. Metabolic fingerprints of leaves extracts of dried and stored *Lychnophora salicifolia* (voucher samples of the UEC-herbarium) originating from three different states (Bahia, Goiás and Minas Gerais) were acquired by MALDI-MS and subsequently classified by multivariate data analysis based on their metabolite fingerprints. Mass spectra were acquired by a MALDI-TOF/TOF mass spectrometer (ultrafleXtreme, Bruker, Daltonics). Multivariate data analyses were performed by *R* (free software environment for statistical computing). By basic multivariate statistical analysis, the three voucher samples could be correctly separated. The correct classification of three voucher samples of *L. salicifolia* based on their metabolite fingerprints is a first successful attempt in applying MALDI-MS in metabolomics studies for (taxonomic) classification of plants.

Biography

Norberto Peporine Lopes has completed his Ph.D at the age of 28 years from University of São Paulo and postdoctoral studies from Chemistry Department-University of Cambridge-UK. He has published more than 190 papers in reputed journals and serving as an editorial board member of repute. He is author of 5 books in addition to others 10 book chapters. He is currently Full Professor in Organic Chemistry at the University of São Paulo and is board member of the Brazilian Chemical Society and of the Brazilian Society of Mass Spectrometry.