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## Fingernails: Development and validation of a rapid and sensitive method for quantification of cocaine by LC-ESI-MS/MS

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Cocaine (COC) is an alkaloid derived from *Erythroxylum coca*, a stimulant drug, which speeds up the activity of the brain and other parts of the central nervous system (CNS), therefore presenting a high potential of abuse. COC use has been monitored most commonly in urine and blood, but other matrices such as sweat, saliva, viscera, vitreous humor, meconium and keratinized matrices have been applied. When checking for past or chronic exposure to COC however, human keratinized tissues such as hair and nails are advantageous. These matrices can sequester xenobiotics and their products of biotransformation regardless of the exposure phase, due to their continuous growth and their ability to incorporate such compounds. Furthermore, the collection of these samples are simple and noninvasive, and can be monitored preventing tampering, since the analytes are highly stable in those matrices. Although hair samples have been widely studied and used, the interest in the use of nails is more recent and has increased in forensic toxicology studies. Such samples are also highly stable and allows for the investigation of past and chronic exposures. We have compared previously published extraction methods and herein propose a new simple and fast method to detect and quantify cocaine and its metabolites in fingernails by liquid chromatography mass spectrometry (LC-MS). Confidence parameters of validation of the method were: specificity, linearity, intra- and interbatch, limit of detection (LOD), limit of quantitation (LOQ) and matrix effect. The LOD was 0.01 ng.mL<sup>-1</sup> and the LOQ was 0.5 ng.mL<sup>-1</sup>. Linearity showed correlation coefficient (r) for COC, benzoylecgonine (BZE) and cocaethylene (COE) higher than 0.99. Good intra- and inter-assay precision, and specificity were also observed for all detected molecules and no major matrix effect could be noted. When LC-MS/MS monitoring is applied, nails seem indeed to offer quite useful surrogates for chronic and past use of COC.

### Biography

Heliara Nascimento is a Pharmacist from the University of São Paulo (USP, Brazil). She received her Ph.D. from the University of São Paulo (USP, Brazil). She has worked in the P&D center of Oxiteno a petrochemical industry as the Analytical Research Laboratory Manager. She is also a postdoctoral fellow at the ThoMSon Mass Spectrometry Laboratory, Institute of Chemistry (UNICAMP, Brazil) where she is currently a Researcher Collaborator. Her research focuses on the area of analytical chemistry and method validation applied to food, biofuels, drugs, veterinary products, agrochemicals, natural products and cosmetics analysis.

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