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Determination of gossypol and Cu-pyropheophytin A in edible oils by liquid chromatography tandem mass spectrometry

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In 2013, the health harmful gossypol and Cu-pyropheophytin A were found in the edible oil in Taiwan, therefore, the safety of the edible oil was became an important issue in food safety. In this study, a simple, rapid and sensitive analytical method was developed for simultaneously determination of the gossypol and Cu-pyropheophytin A in edible oils by using dispersive solid-phase extraction (DSPE) combined with liquid chromatography-tandem mass spectrometry (LC-MS/MS). Gossypol and Cu-pyropheophytin A extracted from edible oils by using 5mL petroleum ether then adsorbed by 20 mg of chlorofilter sorbent could obtain the highest extraction efficiency. After desorbing by 1 mL of acetone, the extractant was analyzed by LC-MS/MS with atmospheric pressure chemical ionization (APCI). The proposed method was also applied to analyze edible oils purchased from the markets.

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Acids causing metabolic acidosis in patients with severe malaria: Application of liquid chromatography-mass spectrometry to clinical chemistry

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Acidosis is an important cause of mortality in severe falciparum malaria. A simultaneous bio-analytical method for assessment of plasma eight small organic acids potentially contributing to acidosis in severe malaria was developed and validated. High-throughput strong anion exchange solid-phase extraction in 96-well plate format was used for sample preparation. Hydrophilic interaction liquid chromatography (HILIC) coupled to negative mass spectroscopy was utilized for separation, detection and quantification. Eight possible small organic acids; L-lactic acid (LA),α-hydroxybutyric acid (aHBA), β-hydroxybutyric acid (bHBA), p-hydroxyphenyllactic acid (pHPLA), malonic acid (MA), methylmalonic acid (MMA), ethylmalonic acid (EMA) and α-ketoglutaric acid (aKGA) were analyzed simultaneously using a ZIC-HILIC column. This method was validated according to U S Food and Drug Administration guidelines with additional validation procedures for endogenous substances. LC-MS acid concentration profiles in relation to clinical parameters of three groups; severe malaria, uncomplicated malaria and healthy were analyzed by pattern recognition analysis to classify and predict unknown samples. The results of principal component analysis (PCA) showed that four acids (LA, aHBA, bHBA and pHPLA) have more significant discriminant power than other four, thus they all considered. In addition, PCA result showed that healthy could be classified from malaria completely with variance of three first PCs (73.11, 15.41 and 7.84%, respectively). Linear discriminant analysis (LDA) model indicated excellent sensitivity and specificity for identification of malaria and healthy. However, the result indicated fair sensitivity (65%) and good specificity (91%) for identification of severe and uncomplicated. This could be useful tool for understanding pathogenesis of acidosis in severe malaria patients.

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