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Quantification of Hypoglycin A and Methylenecyclopropylglycine in Human Plasma by HPLC-MS/MS

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Abstract: Hypoglycin A (HGA) and methylenecyclopropylglycine (MCPG) are naturally-occurring amino acids known to cause hypoglycemia and encephalopathy. Exposure to one or both toxins through the ingestion of common soapberry (*Sapindaceae*) fruits are documented in illness outbreaks throughout the world. Jamaican Vomiting Sickness (JVS) and seasonal pasture myopathy (SPM, horses) are linked to HGA exposure from unripe ackee fruit and box elder seeds, respectively. Acute toxic encephalopathy is linked to HGA and MCPG exposures from litchi fruit. HGA and MCPG are found in several fruits within the soapberry family and are known to cause severe hypoglycemia, seizures, and death. HGA has been directly quantified in horse blood in SPM cases and in human gastric juice in JVS cases. This work presents a new diagnostic assay capable of simultaneous quantification of HGA and MCPG in human plasma, and it can be used to detect patients with toxicity from soapberry fruits. The assay presented herein is the first quantitative method for MCPG in blood matrices.

Keywords: Soapberry, *Sapindaceae*, Acute Toxic Encephalopathy, Hypoglycin A (HGA), Methylenecyclopropylglycine (MCPG)