DEVELOPMENT OF A HPLC-DAD-MS METHOD FOR THE QUALITY EVALUATION OF GUARANA (*Paullinia cupana*) SUPPLEMENTS

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Guarana (*Paullinia cupana*) is a very popular plant native to Brazilian Amazon, whose seeds are worldwide consumed as food supplements (FS), due to their beneficial stimulatory and antioxidant effects [1], among others. These activities are mainly related to different methylxanthines (caffeine, theophylline and theobromine) and phenolic compounds (cathechin, epicathechin, epicathechin gallate, etc.) [2]. Despite guarana FS are generally perceived by consumers as natural and harmless antiobesity products, they had been target of different frauds and adulterations in the last years. Then, the development of improved analytical methodologies to evaluate their quality is of great interest.

In this work, a chromatographic HPLC-DAD-MS method for the simultaneous determination of methylxanthines and phenolic compounds in guarana FS was developed. Two kinds of commercial FS based on guarana extracts (GE) or ground seed powder (GSP), were purchased in specialized shops, pharmacies and web sites. Reference extracts from guarana seeds were laboratory-made by solid-liquid extraction under different conditions (time, temperature) to simulate FS industrial processes. A new HPLC-DAD-MS method was optimized by evaluating different columns and analytical conditions (mobile phases, additives, flows, MS adquisition mode, etc.). The best separation was achieved with a Poroshell 120 SB-C18 column (Agilent) using a gradient 0.1% acetic acid:acetonitrile and 0.4 mL min^{-1} as flow rate. MS operating in positive mode was used for quantitative analysis. Bioactive caffeine was the most abundant compound detected in all analysed samples. Phenolic compounds and other methylxanthines evaluated as potential authentication markers, were also present in lower concentrations. Relationships of caffeine/theophylline and caffeine/theobromine concentrations determined in reference samples were used to establish an authenticity profile for evaluation of FS quality. The methodology here developed is a valuable contribution to the reliable and barely explored authentication of FS associated with the analysis of minor components.

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References

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