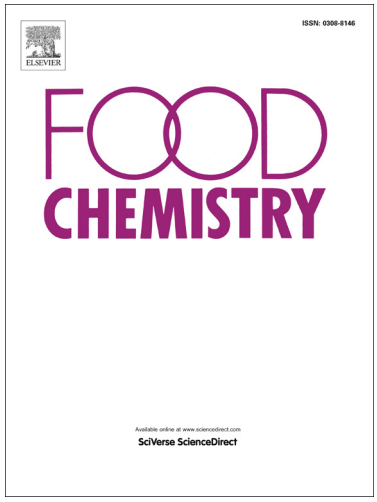

High-throughput assay comparison and standardization for metal chelating capacity screening: a proposal and application

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HIGH-THROUGHPUT ASSAY COMPARISON AND STANDARDIZATION FOR METAL CHELATING CAPACITY SCREENING: A PROPOSAL AND APPLICATION

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Abstract

Aiming to standardize the experimental protocols to assess the ability to chelate Fe^{2+} and Cu^{2+} using 96-well microplates, we analyzed Brazilian coffees (n=20) as a study-case in relation to their antioxidant activity using conventional methods (DPPH and FRAP assays) and correlated the results with the total phenolic content (TPC) using bivariate and multivariate statistical approaches. Complementarily, we assessed the precision, reproducibility, accuracy, and linearity of both methods. Data showed that the proposed assays presented a good repeatability and reproducibility (<7% RSD) and recovery values of 96.66% and 98.91% for the iron and copper assays, respectively. Both methods were linear in the range of 0 to 100 mg EDTA equivalents/L. Cu^{2+}-chelating ability was significantly correlated to FRAP, DPPH, and TPC, while sparse ($p<0.05$) correlations were obtained with Fe^{2+}-chelating ability. Overall, both