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Folin-Ciocalteu relative antioxidant activity and its application in evaluating food and herbal products

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In this work, we established a new methodology to simultaneously assess the relative reaction rates of multiple antioxidant compounds in one experimental set-up. This new methodology hypothesizes that the competition among antioxidant compounds towards limiting amount of free radical (in this article, DPPH) would reflect their relative reaction rates. In contrast with the conventional detection of DPPH decrease at 515 nm on a spectrophotometer, depletion of antioxidant compounds treated by a series of DPPH concentrations was monitored instead using Liquid Chromatography Coupled with Quadrupole Time-of-Flight (LC-QTOF). A new parameter, namely Relative Antioxidant Activity (RAA), has been proposed to rank these antioxidants according to their reaction rate constants. We have investigated the applicability of RAA using pre-mixed standard phenolic compounds and also extended this application to two food products, i.e. red wine and green tea. It has been found that RAA correlates well with the reported k values. This new parameter, RAA, provides a new perspective in evaluating antioxidant compounds present in food and herbal matrices. It not only realistically reflects the antioxidant activity of compounds when co-existing with competitive constituents and it could also quicken up the discovery process in the search for potent yet rare antioxidants from many herbs of food/medicinal origins.

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