Antioxidant capacity of phenolic compounds in acidic medium: A pyrogallol red-based ORAC (oxygen radical absorbance capacity) assay

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A novel ORAC (oxygen radical absorbance capacity) assay to assess antioxidant capacity of phenolic compounds in near-gastric conditions (pH 2.0) is presented. AAPH (2,2'-azo-bis(2-amidinopropane)dihydrochloride) was used as peroxyl radicals source, and fluorescein, pyranine and pyrogallol red were employed as target molecules. Only pyrogallol red (PGR) showed a behavior compatible with an ORAC assay under acidic conditions (ORAC-PGRa). Excepting Trolox and ascorbic acid, phenolic compounds protected PGR, giving kinetic profiles without the presence of an induction time. ORAC-PGRa values, which reflect the reactivity of the antioxidants toward peroxyl radicals, ranged from 0.2 (caffeic acid) to 29.1 (myricetin) gallic acid equivalents. The ORAC-PGRa method showed analytical parameters in agreement with other ORAC-like assays and was applied to wines, teas, commercial juices and herb infusions, peach juice being the sample with the highest ORAC-PGRa value (7.1mM gallic acid equivalents).