Free radical scavenging activity of conjugated linoleic acid as single or mixed isomers.

ABSTRACT

Context: Conjugated linoleic acids (CLAs) are a mixture of positional and geometric isomers of linoleic acid (LA) and believed to have many positive biological activities. Objective: The present study was undertaken to assess the antioxidant activity of cis-9, trans-11 and trans-10, cis-12 as single or mixed CLA isomers at two ratios, 1:6 and 1:13 (trans-10, cis-12/cis-9, trans-11). Materials and methods: A microplate reader was used to determine the free radical scavenging properties of CLAs against DPPH radical in ethanol. Results: The kinetic reactions of CLA-DPPH• showed that all tested CLAs have exerted radical scavenging activities in a dose-dependent manner and observed to immediately react and quench DPPH radicals at all tested levels and no lag phase was noticed in CLA-DPPH• reactions. The median inhibitory concentration (IC50) value for cis-9, trans-11 CLA was observed to be more effective than other tested CLA. Total antioxidant capacity (TAC) of all tested CLAs were less effective radical scavengers as compared to vitamin E and butylated hydroxytoluene, although all tested CLAs were quenched a high amount ($P<0.05$) of DPPH free radicals. Discussion and conclusion: All tested CLAs have the ability to directly react and quench DPPH free radicals in ethanol. Furthermore, trans-10, cis-12 CLA has greater maximal efficacy than other tested CLAs as free radical scavenger, while cis-9, trans-11 CLA is the most potent isomer to directly react and quench free radicals at low concentrations in the system, suggesting that the free radical scavenging activity of CLA isomers may contribute to their diverse biological activities.

Keyword: Antioxidants; DPPH assay; Kinetic reaction; Median inhibitory concentration; Total antioxidant capacity.