In Vitro Formation of 8-hydroxy-2′-deoxyguanosine (8-OHdG) in Calf Thymus DNA upon Treatment of 2′-deoxyguanosine with Propyl Gallate and 2,6-di-tert-butyl-p-benzoquinone

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Abstrak

Oxidative DNA damage caused by propyl gallate (PG) and 2,6-di-tert-butyl-p-benzoquinone (BHT-quinone, a metabolite of butylated hydroxytoluene (BHT)) was analyzed from the 8-hydroxy-2′-deoxyguanosine (8-OHdG) formation in calf thymus DNA and DNA base, 2′-deoxyguanosine (dG). PG in the presence of CuCl2 increased the 8- OHdG formation in calf thymus DNA by around 9.17 times as compared to the control (untreated DNA). In the presence of CuCl2 at 1.28×10-5 M, the 8-OHdG per dG ratio resulting from the reaction of dG with PG at various concentrations (20–150 ppm) ranged from 75.50 to 312.06 8-OHdG per 105 dG. The 8-OHdG formation increased when the PG concentration was increased from 20 ppm to 80 ppm, and then, it began to plateau around 80 ppm. On the other hand, BHT-quinone increased the formation of 8-OHdG in the presence of CuCl2 by 0.05 times as compared to the control (untreated DNA). LC-MS/MS analysis was used to identify the molecular structure of 8-OHdG, which had a base peak (M+. + 1) at m/z = 284 and two main fragments at m/z = 167.9 and m/z = 139.9.