

Antiproliferation and Anti-Influenza Viral Activities of Caffeic Acid Phenethyl Esters Synthesized Enzymatically from Chlorogenic acid and Phenethyl Alcohol

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SUMMARY

Phenylethyl caffeates synthesized enzymatically from 5-chlorogenic acid and alcohols absorbed a part of long-wavelength ultraviolet rays because of their absorption maximum over 320 nm. 1,1-Diphenyl-2-picrylhydrazyl radical and superoxide anion scavenging activities (IC₅₀) of 1- and 2-phenylethyl caffeates ranged from 11 to 12 and 5 to 6 μ M, respectively, and those activities were 1.8 times higher than activity of ascorbic acid which is commonly used as antioxidants. Both phenylethyl caffeates inhibited the growth of *Staphylococcus aureus*, *Bacillus subtilis*, and *Pseudomonas aeruginosa* at 0.22-0.44, 0.44-0.88, 0.44-0.88 mM, respectively, by 96-well microbioassay system used a liquid broth culture system in a dose response format. 2-Phenylethyl caffeate activated the growth of normal human diploid lung fibroblast WI38 cells at 35 μ M, whereas SV40 virally transformed WI38 cells (WI38VA) were sensitive to 2-phenylethyl caffeate (IC₅₀ 60 μ M). Human histiocytic lymphoma U937 and human oral carcinoma KB cells were also sensitive to 1- and 2-phenylethyl caffeates (26-48% inhibition at 35 μ M). Influenza viruses A and B were inhibited 95 and 92% of their replication by 8.8 μ M 1-phenylethyl caffeate, respectively, and virus A was inhibited 99% by 35 μ M 2-phenylethyl caffeate. These phenylethyl caffeates might inhibit the virus replication in infectious cells.