Synopsis of Original Research Paper

Screening for suppression of inflammatory responses against UVB–induced DNA damage in skin cells from natural plant extract, and analysis of its suppressive mechanism

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Many naturally occurring agents are believed to protect against ultraviolet (UV)-induced skin damage. I established an *in vitro* assay to measure cellular DNA polymerase (Pol) activity in cultured normal human epidermal keratinocytes (NHEK) by modifying Pol inhibitor activity, and screened 10 tropical plant extracts for Pol activity enhancement. I found that the fruit of Rose Myrtle (*Rhodomyrtus tomentosa*) was the strongest enhancer of Pol activity in UVB-irradiated NHEK. I next sought to examine the effect of the Rose Myrtle extract active component, piceatannol, on UVB-induced damage and inflammation in cultured NHEK. The protective effect of rose myrtle extract and the two key components, piceatannol and picea tannol-4'-*O*-β-D-glucopyranoside, on UVB-induced damage and inflammation in cultured NHEK was investigated. The 80% ethanol extract from rose myrtle fruit with piceatannol exhibited protection of UVB-induced cytotoxicity in NHEK; however, piceatannol-4'-*O*-β-D -glucopyranoside exhibited no protection, as determined by a 3-(4,5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide assay. This extract and piceatannol reduced the production of UVB-induced cyclobutane pyrimidine dimers and enhanced the cellular enzyme activity of the DNA polymerases in UVB-irradiated NHEK, suggesting that UVB-stimulated DNA damage was repaired by the polymerases. In addition, the secretion of prostaglandin E2, which is an inflammatory mediator, was decreased. These results indicated that rose myrtle fruit extract and its key constituent, piceatannol, are potential photoprotective candidates for UV-induced skin damage.