Symposium I

S-07 Biological Activities of HydroPG Extract from Damask Rose (*Rosa damascena* Mill.) Planted in Thailand for UV-induced Damaging Protection

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The hydroPG extract from Damask Rose (Rosa damascene Mill.) petals was analyzed for its capability in protecting UV-induced damages. Results revealed this extract provided low sun protection factor (SPF) detected by SPF 290S UV spectrophotometer but showed high protective effects against UVA- and UVB-induced fibroblast H2dl cell damages tested by MTT assay. It harbored the antimutagenic potentials towards UVA- and UVB-induced mutation in Escherichia coli B/r WP2 (trpE65) shown by modified Ames test as well as had the protective effects against UVA- and UVB-induced DNA damages in fibroblast H2dl cells experimented by propidium iodide flow cytometry assay. Besides, tests run by photochemiluminescence, DPPH and oxidative hemolysis assays demonstrated that the extract possessed the appreciable antioxidant potentials. In terms of safety, it caused no irritation on human skin run by patch test, and was not cytotoxic on NIH 3T3 mouse embryonic fibroblast H2dl cells performed by cytotoxic MTT assay (in addition to the non-toxic effect shown to aforementioned fibroblast H2dl cells). The extract was then incorporated into lotion and sunscreen lotion. The products with and without the extract were primarily determined to cause no irritation on human skin. Those with the extract provided higher SPF than those without. They could also reduce UVA- and UVB-induced mutation in E. coli B/r WP2 (trpE65) as demonstrated by the sole extract.

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S-08 4-Oxo-2-hexenal, a mutagen formed by ω -3 fat peroxidation: occurrence, detection and adduct formation.

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4-Oxo-2-hexenal (4-OHE), recently identified as a lipid peroxide-derived compound, is mutagenic in the Ames test (1). 4-OHE is probably generated by the oxidation of w-3 fatty acids, which are commonly found in dietary fats, such as fish oil, perilla oil, rapeseed oil and soybean oil. Therefore, 4-OHE might be a major cytotoxic lipid peroxide in foods (2). 4-OHE reacts with DNA to form dG, dA and dC-adducts in vitro. After 4-OHE was orally administered to mice, 4-OHE-dC- and 4-OHE-5-methyl-dC adducts were detected in esophageal, stomach and intestinal DNA. The formation of 8-OH-dG in mouse liver DNA was also observed after an i.p. injection of 4-OHE. The serum levels of the 8-OH-Gua free base were analyzed by a newly developed HPLC column switching technology, using anion exchange- and reverse phase- columns coupled with an electrochemical detector (HPLC-ECD). We detected an increase in 8-OH-Gua after 4-OHE treatment. The serum 8-OH-Gua level may be a useful in vivo marker of oxidative stress induced by genotoxic chemicals. Workers involved in the manufacturing of vegetable oils, fish oil, instant noodles and snack foods, as well as kitchen workers, will be exposed to 4-OHE. Since 4-OHE induces DNA adduct formation in experimental animal organs, further studies on the carcinogenicity of 4-OHE and its detection in working environments will be required. References 1)Maekawa M, Kawai K, Kasai H, et al., Identification of 4-oxo-2-hexenal and other direct mutagens formed in model lipid peroxidation reactions as dG-adducts, Chem. Res. Toxicol., 2006; 19:130-138 2)Kawai K, Matsuno K, Kasai H. Detection of 4-oxo-2-hexenal, a novel mutagenic product of lipid peroxidation, in human diet and cooking vapor. Mutat Res. 2006; 603:186-92.

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