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PERSIMMON (DIOSPYROS KAKI THUNB 'SAIJO') PEEL IMPROVED DYSLIPIDEMIA AND ITS RELATED PRODUCTION OF ATHEROGENIC AUTOANTIGEN COMPLEXES IN LOW-DENSITY LIPOPROTEIN RECEPTOR-DEFICIENT MICE

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Introduction The fruit persimmon contains several bioactive compounds, such as polyphenols, flavonoids, terpenoids, steroids, dietary fiber, carotenoids and minerals. Though persimmon peel (PP) is rich in carotenoids and polyphenols rather than persimmon pulp, the peel is discarded during production of dried fruit. It has been reported that the PP components have beneficial effects such as antioxidant activity, and tyrosinase inhibiting activity (whitening activity). It was also reported that young persimmon fruit has hypolipidemic effect. In the present study we examined the effect of PP on dyslipidemia, atherogenesis, and production of immune-regulated components in hypercholesterolemic mouse model to evaluate the possibility of PP as preventive food supplements against atherogenesis.

Materials and Methods (1) Diets (2) Animals and Experimental Protocol (3) Plasma Lipids (4) Preparation of mouse aortas and quantification of atherosclerosis (5) Preparation and oxidation of mouse LDL (6) Antibodies (7) ELISA for mouse oxLDL/b2GPI complexes (8) ELISA for 11-dehydrothromboxane B_2 (11-dhTXB_2) (9) 8-Hydroxy-2′-deoxyguanosine (8-OHdG) and adiponectin measurement (10) ELISA for IgM anti-oxLDL antibody (11) Statistical analysis 3.

Results (1) Body weight and blood lipids (2) Plasma oxLDL/b2GPI level Plasma oxLDL/b2GPI complex levels in LDLR-deficient mice fed HF-A, HF-B, and HF-B+PP significantly increased after high fat loading, but the complexes in LDLR-mice fed MF stayed in the level similar to the beginning of the experiment. After 12 weeks of feeding, HF-A feeding led to significant increment in plasma oxLDL/b2GPI complexes ($p<0.0005$), while HF-B+PP feeding resulted in significant decrease ($p<0.05$) when compared with HF-B, respectively. (3) Atherosclerotic lesions PP supplementation reduced the lipid-deposit lesion areas in the entire aortic tree by 70% compared

with mice fed HF-B. Atherosclerotic lesion was also significantly smaller in the aortic arch and abdominal aorta than those in the HF-B group. (4) Urinary 8-OHdG and plasma adiponectin (5) Urinary 11-dehydrothromboxane B_2 After 8 weeks of feeding, persimmon peel supplementation showed significant inhibition of raise in 11-dhTXB_2 ($p<0.05$) when compared with HF-B. (6) Antibody against oxLDL In LDLR-deficient mice fed HF-B+PP, the level of antibodies against oxLDL at 20 weeks of age was lower than that in HF-B, but it was not significant. At 24 weeks of age, antibody levels in HF-B+ PP largely varied and difference between HF-B and HF-B+PP resulted in no statistical significance.

Conclusion Our study demonstrated that persimmon peel prevented the increment of blood cholesterol, triglyceride, and oxLDL/b2GPI atherogenic autoantigen levels, and prevented the progression of atherosclerosis in the LDLR-deficient mouse, but did not influence natural antibody induction against oxidised LDL. Though the precise mechanism and functional constituents of preventing atherosclerosis are not identified, persimmon peel would be beneficial in the development of preventive food supplement against dyslipidemia and atherosclerosis.