

Pigment Cell Res. 2003 Dec;16(6):629-38

Lightening effect on ultraviolet-induced pigmentation of guinea pig skin by oral administration of a proanthocyanidin-rich extract from grape seeds.

Yamakoshi J, Otsuka F, Sano A, Tokutake S, Saito M, Kikuchi M, Kubota Y.

Research and Development Division, Kikkoman Corporation, Noda, Noda City, Chiba, Japan. 7161@mail.kikkoman.co.jp

Antioxidants such as vitamins C and E have been reported to inhibit the progression of ultraviolet (UV) radiation-induced pigmentation in the skin of hairless mice. However, little is known of the lightening effect of proanthocyanidin, a powerful polyphenolic antioxidant, on UV-induced pigmentation of the skin. We investigated the lightening effect of oral administration of a proanthocyanidin-rich grape seed extract (GSE) using guinea pigs with UV-induced pigmentation. These pigmented guinea pigs were fed diets containing 1% GSE or 1% vitamin C (w/w) for 8 weeks. GSE-feeding had an apparent lightening effect on the guinea pigs' pigmented skin. Histologic evaluation demonstrated a decrease in the number of 3,4-dihydroxyphenylalanine (DOPA)-positive melanocytes as well as 8-hydroxy-2'-deoxyguanosine (8-OHdG)-positive, Ki-67-positive, proliferating cell nuclear antigen (PCNA)-positive melanin-containing cells in the basal epidermal layer of the UV-irradiated skin in GSE-fed guinea pigs. In contrast, these parameters did not change in the skin of vitamin C-fed or control guinea pigs. GSE inhibited the activity of mushroom tyrosinase and also inhibited melanogenesis without inhibiting the growth of cultured B16 mouse melanoma cells. In conclusion, we demonstrated that oral administration of GSE is effective in lightening the UV-induced pigmentation of guinea pig skin. This effect may be related to the inhibition of melanin synthesis by tyrosinase in melanocytes and the reactive oxygen species (ROS)-related proliferation of melanocytes.