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Evaluation the performance and application of vernal plant on skincare products

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This study evaluated the anti-oxidation, DNA protection, anti-melanogenesis and anti-inflammatory properties of vernal plant on water (VPEW) and ethanol (VPEE) extraction. First, the preliminary tests confirmed that the VPEE better than VPEW, then we will further to evaluate VPEE on cell and animal experiments.

In our study, we found that vernal plant extract shows less cytotoxicity in keratinocytes (HaCaT), melanoma (B16) and human fibroblasts (Hs68). In antioxidant experiments, VPEE had an excellent ability of free radical scavenging $DPPH^{\cdot}$ and $ABTS^{\cdot+}$. Meanwhile, VPEE also decreased cellular oxidative stress, increased the intracellular GSH content and increased the amount of antioxidant enzyme expression. Otherwise, we also assessed that VPEE whether protected DNA form UVB and oxidants damage. VPEE inhibited the activity of HAase (hyaluronidase) and MMPs(Matrix metalloproteinases), DNA fragmentation, UVB Photoproducts (CPD, 6-4 PPs and PPs) formation and it promoted cellular collagen formation, would healing and regulated the protein expression of NER system(nuclear excision repair).

Because of UVB and oxidant may cause the inflammatory response and skin pigmentation, so we assessed the properties of VPEE on anti-inflammatory and anti-melanogenesis as well. The data showed that VPEE inhibited the inflammatory factors (TNF-α, IL-1β and IL-6) release in HaCaT cells by LPS (lipidpolysaccharide) stimulation and it decreased the level of the inflammatory-related protein expression. Besides, VPEE inhibited the melanin secretion and intracellular tyrosinase activity. VPEE also decreased the melanogenesis related protein expression of melanoiflorin receptor (MC1R), microphthalmia-associated transcription factor(MITF), tyrosinase, tyrosinase-related protein-2(TRP-2) and tyrosinase-related protein-1(TRP-1).

This study demonstrated that VPEE had the capacities of antioxidant, inhibiting of melanin formation; DNA protection and DNA repair as well as decreasing inflammatory factors production. VPEE had a potential to become a novel health care products or food additives on whitening, antioxidant and anti-inflammatory.