



GLOBAL SKIN HEALTH

EFFECT OF CORDYCEPS EXTRACT ON MEMBRANE PROTEINS EXPRESSION FOR UVB-INDUCED OXIDATIVE STRESS DAMAGE IN HUMAN EPIDERMAL KERATINOCYTES

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Introduction: UV radiation causes induced H₂O₂, oxidized lipid hydroperoxides and ROS, and subsequent causes changes in the microstructure of the cell leading to the damage of membrane proteins and lipids. Although Cordyceps has widely been used for over 2,000 years as a natural fungal drug and traditional Chinese medicine, it has rarely been applied in skin care.

Objectives: This study aimed to explore the roles of Cordyceps extract in protection against UVB-induced oxidative stress leading cellular ultrastructure damage such as membrane and tight junction injuries in HaCaT keratinocytes.

Methods: UV-Vis and HPLC methods were determined to analyze the components of Cordyceps extract. ABTS⁺, DPPH[•], OH[•] and O₂^{•-} scavenging ability were respectively assessed on commercially test kits. The safety of Cordyceps extract was determined by CCK-8 assay. SOD activity and MDA content were used to measure anti-oxidation effect. To assess the anti-UVB cellular ultrastructure damage effect of Cordyceps extract, AQP3, CD44, Claudin-1, ZO-1 synthesis and keratinocytes proliferation were determined on HaCaT keratinocytes. AQP3, CD44, Claudin-1, and ZO-1 mRNA expression were examined by qPCR and the expression of the proteins were detected by Western blot.

Results: Results shows that the Cordyceps extract has good scavenging ability to ABTS⁺, DPPH[•], OH[•] and O₂^{•-}. After UVB radiation, SOD activity HaCaT cells in Cordyceps extract is higher than UVB radiation group, and the MDA contents in after adding the Cordyceps extract is less than UVB radiation group. Cordyceps extract can enhance cell viability against UVB-induced damage and predominantly reversed the down-regulation of AQP-3, CD44, Claudin-1 and ZO-1 by UVB.





Conclusion: Overall, results demonstrated significant benefits of Cordyceps extract on the protection of keratinocytes against UVB injuries, especially on UVB-induced cellular structural injury lessen and on the protection of skin barrier function, and suggesting its potential use in skin care products.

