

The effects and mechanisms of *Neonauclea reticulata* on anti-photoaging

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Objectives

The ultraviolet (UV) radiation within sunlight is a major occasion of skin damage. UV irradiation of skin not only decreases antioxidant defensive system, but also increases reactive oxygen species (ROS) which form oxidative stress. Increased ROS production alters gene and protein structure and function leading to skin damage. In addition, UV irradiation of skin degrading the extracellular matrix (ECM) resulting in photoaging. The exposure of skin to UV radiation also stimulates the expressions of matrix metalloproteinases-1, -3 and -9 (MMP-1, -3 and -9) in dermis, which degrades the ECM. Polyphenols and flavonoids possessed a variety of biological activities including anti-oxidation and inhibitory effects on MMP-1, -3 or -9 in dermal fibroblasts. *Neonauclea reticulata* belongs to Rubiaceae and flavonoids are widely distributed in these plants. The aim of this study is to investigate the antioxidant and anti-photoaging effects of *Neonauclea reticulata* extracts.

Materials and Methods

The methanol and water extract of *Neonauclea reticulata* were subjected to the antioxidant and antiphotaging studies. The antioxidant effect was examined by DPPH scavenging and AAPH-induced haemolysis assay. The effects and mechanisms of the extract will be investigated by MMPs activity assays by fluorescent gelatin, elastase assay, UVB irradiation, type I procollagen assay and MTT assay in human fibroblasts (Hs68) after UV exposure.

Results

The methanol and water extraction yield of *Neonauclea reticulata* were 5.6% and 17% respectively. The result of gelatin digestion assay showed that both of methanol and water extract of *Neonauclea reticulata* inhibited MMP-1 activity at 1 mg/mL. In fluorescence-substrate assay, the inhibition of both of methanol and water extract of *Neonauclea reticulata* on MMP-1 activity showed a dose-dependent manner within 10 – 500 µg/mL. Furthermore, the methanol and water extract of *Neonauclea reticulata* for the DPPH radical-scavenging activity at the concentration of 50 µg/mL were similar to that of ascorbic acid. The water extract of *Neonauclea reticulata* also possessed inhibitory activity against AAPH-induced haemolysis of erythrocytes in dose- and time-dependent manner at concentrations of 50 to 500 µg/mL from 1 to 4 h. The results shown that pretreated with the water extract of *Neonauclea reticulata* at the concentration of 25, 10 and 50 µg/mL could decrease the expression of MMP-1, -3 and -9 respectively. In addition, the water extract of *Neonauclea reticulata* has no cytotoxicity.

Conclusion

These findings shown that the extract of *Neonauclea reticulate* exhibited antioxidant activity resulting in inhibition of MMP-1, -3 and -9. They could be potential a cosmeceutical material to improve wrinkle of intrinsic aging and photoaging skin.

Reference

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