The effects and mechanisms of *Flemingia macrophylla* on anti-photoaging

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Objectives

Matrix metalloproteinase-1, 3, 9 (MMP-1, 3, 9) play important roles in photoaging. The production of MMP-1, 3, 9 in skin is increased after UV-irradiation. The increase then causes the degradation of collagen and elastin even forms coarse wrinkles and sagging skin. Skin photocarcinogenecity also causes by UV-induced ROS, which can initiate lipid peroxidation and produce lipid alkoxy radicals, then combine with DNA to form DNA adducts.

Polyphenols and flavonoids possessed a variety of biological activities including anti-oxidation and free radical scavenging effects. According to the literatures, many polyphenols and flavonoids had significant inhibitory effects on matrix metalloproteinase 1, 3 or 9 in dermal fibroblast and chemoprotective activity for skin cancer. Flavonoids are widely distributed in natural plants of Fabaceae. In our preliminary test, *Flemingia macrophylla* extract showed marked inhibition of collagenase and antioxidant activities in a dose dependent manner.

Materials and Methods

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

Results

The water extraction yield of *Flemingia macrophylla* was 18.2%. The result of gelatin digestion assay showed that *Flemingia macrophylla* extract inhibited MMP-1 activity at 100 μg/mL. In fluorescence-substrate assay, the inhibition of *Flemingia macrophylla* extract on MMP-1 activity showed a dose-dependent manner within 10, 50, 100, 500 μg/mL. Furthermore, the *Flemingia macrophylla* extract for the DPPH radical-scavenging activity at the concentration of 5 μg/mL was similar to ascorbic acid (50 μg/mL). The *Flemingia macrophylla* extract also possessed inhibitory activity against AAPH-induced haemolysis of erythrocytes in dose- and time-dependent manner at concentrations of 50 to 500 g/mL from 1 to 4 h. The results shown that pretreated with *Flemingia macrophylla* extract at the concentration of 10 μg/mL could decrease expression of MMP-1, -3 and -9 respectively. In addition, the *Flemingia macrophylla* extract has no cytotoxicity.

Conclusion

These findings shown that *Flemingia macrophylla* extract 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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