Combined Effect of Chlorogenic Acid and Myricetin-3-O-Rhamnoside Accelerating Wound Healing

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Medicinal plants have a significant potential to treat wounds caused by trauma, diabetes, ischemic syndromes and other pathological diseases. This is due to their antioxidant, anti-inflammatory and anti-bacterial characteristics. In this context, polyphenols and flavonoids have received increasing attention due to their low toxicity and potential to alleviate symptoms and inhibit the development of various skin disorders, skin aging, and skin damage, including wounds and burns. In this work, we explored the potential of a flavonoid, myricetin-3-O-rhamnoside, and a phenolic compound, chlorogenic acid, both isolated from *Parrotia persica* leaves, to promote wound healing and angiogenesis. This was accomplished using *in vitro* scratch and tube formation assays utilizing human epidermal keratinocytes (HKCs), human dermal fibroblasts (HDFs) and human umbilical vein endothelial cells (HUVECs). We also investigated influence of compounds on driving pro inflammatory environment to anti-inflammatory environment to accelerate wound closure of fibroblast. The assessment of dose response of the compounds demonstrated no cell toxicity between the dosages of 1 µg/ml to 20 µg/ml. We observed chlorogenic acid at 10 µg/ml to be able to accelerate wound closure of HKCs migration by 6-fold as compared to growth media (negative control). On the contrary, myricetin was most effective in promotion of wound closure in assays using HDFs (3-fold increase) and HUVECs (2-fold increase), respectively. Both compounds were able to induce tube formation at an approximately 50% higher rate as compared to growth media control groups. Altogether, our results demonstrate the potential of myricetin and chlorogenic acid to be used in combination in treatment of lesion, bedsores, skin wounds, diabetes ulcers, skin aging and skin diseases.