

Natural Products of Cosmetics: Analysis of Extracts of Plants Endemic to Taiwan for the Presence of Tyrosinase-inhibitory, Melanin-reducing, and Free Radical Scavenging Activities

李美賢;徐鳳麟

Jiang CB;Chang MJ;Wen CL;Lin YP;Hsu FL;Lee MH

Abstract

Non-toxic natural products useful in the formulation of cosmetics are of considerable interest. Recent efforts have focused on the identification of substances that inhibit tyrosinase activity or suppress formation of reactive oxygen species (ROS) in skin cells. Since tyrosinase is the rate-limiting enzyme in the synthesis of melanin, the pigment responsible for the color of human skin, tyrosinase inhibitors may have skin-whitening effects. Since ROS have been implicated in the aging of human skin, agents that suppress the production of ROS may retard such aging. In the present study, ethanol (95%) extracts of 26 plants endemic to Taiwan were examined for their tyrosinase-inhibitory or melanin-reducing activities in human epidermal melanocytes, as well as in vitro free radical scavenging activity. Among the preparations tested, extracts of *Pyracantha koidzumii* (M-165) were found to be the least cytotoxic and to possess the highest cellular tyrosinase inhibitory activity (IC₅₀, 54.8 µg/mL). Extracts of *Acer albopurpurascens* (M-51), *Hygrophila pogonocalyx* (M169), *Machilus japonica* var. *kusanoi* (M-67), and *Eriobotrya deflexa* (M-50) exhibited the most potent free radical scavenging activity against hydroxyl, superoxide, and 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid (ABTS) anion radicals. The IC₅₀ values of M-51, M169, M-67, and M-50 were 3.1, 0.8, 6.6, and 1.8 µg/mL for hydroxyl radical; 5.3, 12.8, 12.4, and 6.1 µg/mL for superoxide radical; 2.4, 7.9, 5.7, and 2.9 µg/mL for ABTS anion radical, respectively. Nevertheless, the phenolic contents were not all correlated with these activities. These plants thus serve as potential sources of ingredients, which could be combined in cosmetic products. Further investigation of the substances responsible for the observed tyrosinase-inhibitory and free radical scavenging activities is therefore warranted.

Key words: plants endemic to Taiwan, tyrosinase, human skin melanocytes, free

radical scavenging activity