25th Symposium on Natural Products

天然藥物研究會

November 6-7th, 2010
Antioxidant capacity and tyrosinase inhibition ability of three different species of dandelion

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ETHNOPHARMACOLOGICAL RELEVANCE: The plants of genus Taraxacum, known as dandelion, have been used as an herbal medicine due to its antidiabetic, choleretic, and diuretic properties. In Europe, plants of the species T. officinale (TO) are used for medicinal purposes, whereas plants of the species T. mongolicum (TM) and T. japonicum (TJ) are utilized in Chinese and Japanese traditional Medicine. Recently, dandelion has been used like a health food to reduce the risks of many diseases, or to maintain the health of spleen, liver, and skin.

OBJECTIVES: Many studies already reported the anti-diabetic and anti-hepatitis activities of dandelion, but its effects on maintenance of skin health, such as anti-pigmentary activities and against free radical induced-aging, have not been established. Therefore, we examined the in vitro effects of three most common used species of dandelion (T. officinale, T. mongolicum, and T. japonicum) for antioxidant and tyrosinase inhibitory activities.

MATERIALS AND METHODS: Tyrosinase is the first and rate limiting enzyme in the synthesis of melanin for skin pigmentation. Three different extracts (Aqueous, 50% ethanol and ethanol) of the three species of dandelion were evaluated for tyrosinase inhibition ability as anti-pigmentary activity. In addition, these extracts were characterized for their scavenging DPPH activity, reducing power, and chelating metal ions.

RESULTS: Aqueous extract of TJ (TJA) present the best inhibition ability of mushroom tyrosinase with IC₅₀ of 1.06±0.13 mg/ml. EC₅₀ values of reducing capacities, and scavenging activities against DPPH radicals showed that TJA also present the best activities, and the EC₅₀ are 0.630±0.017 and 0.83±0.072 mg/ml, respectively. However, only ethanol extract of TO significant exhibited the metal ion chelating ability and it EC₅₀ is 0.287±0.051 mg/ml.

DISCUSSION AND CONCLUSION: These results indicated that TJA exhibits better in vitro reducing capacities, DPPH scavenging and anti-pigmentary activities than any other extracts. Metal ion chelating results found that TJ don’t present any activities of all the three different extracts. Therefore, these results suggest that TJA may not through classical mechanism (chelating the Cu²⁺ ions) to suppress the tyrosinase activities.