

Bioactivities evaluation of tonic Chinese herbal medicines



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Introduction:

In recent years, brand's claim is no longer sole basis in picking cosmetics, more and more consumers will pay attention to whether the ingredients in beauty products are natural, safe and effective, which will give great expansion capacity for natural, healthy Chinese herbal medicine (CHM). In this study, four nourishing CHMs (Prunella vulgaris (Pv) · Cuscuta chinensis (Cc) · Magnolia officinalis (Mo) and Davallia formosana Hayata (DfH) were selected as study materials to estimate the bioactivities by antioxidant ability and antioxidant content assay.

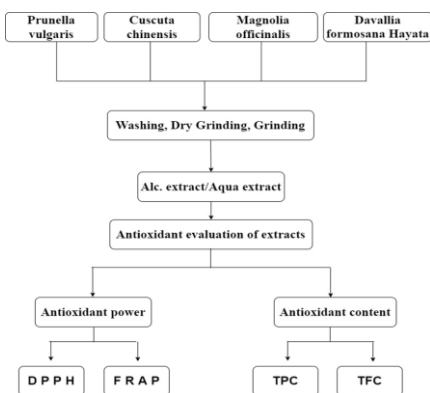
Materials & Methods:

The materials used in this study include Chinese herbal medicines, chemicals and equipment etc. which are described as follows:

Chinese herbal medicine: Prunella vulgaris (Pv) · Magnolia officinalis (Mo) · Cuscuta chinensis (Cc) and Davallia formosana Hayata (DfH).

Chemicals: 95% Ethanol, DPPH (2,2-diphenyl-1-picrylhydrazyl), BHA (Butylated hydroxy - anisole), PBS (Phosphate Buffer Saline), Potassium hexacyano-ferrate(III), Iron(III) chloride hexahydrate, TCA (trichloroacetic acid), Folin-Ciocalteus phenol reagent, Sodium carbonate, Gallic acid, Sodium nitrite, aluminum chloride, Sodium hydroxide, Quercetin, etc. are purchased from Xinxin Chemical and Jingming Chemical respectively.

Equipment: Electronic balance scale coarse scale:(Sartorius/SA07-15US12R, fine scale: SHIMADZU /SA-121A2F-1), Electromagnetic heating stirrer (Thermo /SP88857100), pH meter (model: EUTECH pH-510), Pulverizer (Model: RT-04), Rotary Decompression Concentrator (Brand Yamato, Model: RE 200), Manifold Type Freeze Dryer (Brand: UNISS, Freeze-Drying Host Model: FDM -5-50°C, Vacuum Helper Pu model: VP-200), Spectrophotometer (Perkin Elmer® precisely/Lambda 25).



Results & Discussion:

(1) pH value of extracts

The pH value of Chinese herbal medicines for all of the alcohol extract and water extract (Fig.1).

(2) Free radical scavenging ability assay

The DPPH free radical scavenging ability of 4 CHMs extracts were shown in (Fig.2).

(3) Reducing capacity (FRAP) assay

The Chinese medicinal material with high reducing power in water extract is Pv, but it is not higher than BHA and Vitamin C (Fig.3).

(4) Total Phenol Content (TPC)

The total phenolic content of Pv in the water extract is higher. The total phenolic content of Mo and DfH in the alcohol extract is relatively high (Fig.4).

(5) Total Flavonoid Content assay

It can be known that the overall performance of Mo total flavonoids is outstanding (Fig.5).

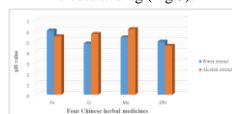


Fig. 1 pH value

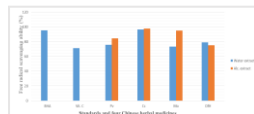


Fig. 2 Free radical scavenging ability

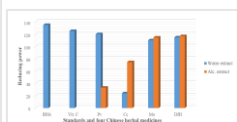


Fig. 3 Reducing capacity

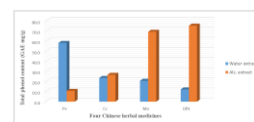


Fig. 4 Total Phenol Content

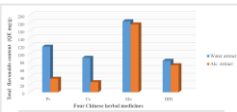


Fig. 5 Total flavonoid content

Conclusions:

All of Chinese herbal medicines extracts are weak acidity. The water extract of Pv has the strongest reducing ability, large amount of total phenol compounds and high the total flavonoid content, it is an excellent antioxidant raw material added to cosmetic and skin care products, which can also be used as a reference material in developing anti-aging products in the future.

Acknowledgements:

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References:

- Jitka Psovtová, Milan Kolář, Jaromír Soušek, Zdeněk Švagerla, Jaroslav Vičar, Jitka Ulrichová. Biological activities of Prunella vulgaris extract. 27 October 2003.
- Guowen Zhang, Li He Mingming Hu. Optimized ultrasonic-assisted extraction of flavonoids from Prunella vulgaris L. and evaluation of antioxidant activities in vitro. January 2011 ; Pages 18-25.
- Chao Li, Qiang Huang, Xiong Fu, Xiu-Jie Yue, Rui Hai, Liu, Li-Jun You. Characterization, antioxidant and immunomodulatory activities of polysaccharides from Prunella vulgaris Linn. April 2015 ; Pages 298-305.
- Homa Hajimehdipoor, Babak Mokhtari kondori, Gholam Reza Amin, Noushin Adib, Hossein Rastegar & Maryam Shekarchi. Development of a validated HPLC method for the simultaneous determination of flavonoids in Cuscuta chinensis Lam. by ultra-violet detection. 16 October 2012.
- Yi Jun, Wu Jian-Guo, Wu Jin-Yu, Wu Yan-Bin. Quality evaluation of the leaves of Magnolia officinalis var. biloba using high-performance liquid chromatography fingerprint analysis of phenolic compounds. 17 December 2015.
- Hsiao Hung-Bo, Wu Jin-Bin, Lin Wen-Chuan. Anti-arthritis and anti-inflammatory effects of (-)-Epicatchin-3-O-β-D-allopyranoside, a constituent of Davallia formosana. January 2019 ; Pages 12-22.
- Zhang Minmin, Cheng Supan, Liang Yan, Mu Yan, Yan Huijiao, Liu Qian, Geng Yanling, Wang Xiao, Zhao Hengqiang. Rapid purification of antioxidants from Magnolia officinalis by semi-prep-HPLC with a two-step separation strategy guided by on-line HPLC-radical scavenging detection. 15 November 2018 ; Pages 140-147.
- Suzuki S., Sato H., Shimada H., Takashima N. (1993), Arakawa M. Comparative Free Radical Scavenging Action of Angiotensin-Converting Enzyme Inhibitors with and without the Sulfhydryl Radical. Pharmacology. 47, 61-65.
- Shi X., Dalal NS., Jain AC. (1991). Antioxidant behaviour of caffeine: Efficient scavenging of hydroxyl radicals. Food and Chemical Toxicology, 29(1), 1-6.
- Woisky RG., Salatino A. (1998). Analysis of propolis: some parameters and procedures for chemical quality control. Journal of Apicultural Research, 37(2), 99-105.
- Christel Q.D., Gressier B., Vasseur J., Dine T., Brunet C., Layekx M., Cazin M., Cazin J.C., Baillet F. and Trotin F. (2000). Phenolic compounds and antioxidant activities of buckwheat hulls and flour. J. Ethnopharmacol, 12, 35-42.