



In vitro effect of antioxidant activities on Chinese herbal medicine extracts

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Introduction:

In recent years, consumers have paid more and more attention to "natural", and there are many companies for development in this regard. Many products on the market are manufactured with a natural and environmentally friendly concept, but most of the antioxidants used in medicines, food, cosmetics, beverages and even feed are synthetic, and synthetic antioxidants are harmful to health or have potential risks to the environment. Due to the impact of COVID-19, Chinese herbal medicines in Taiwan are widely used, and some Chinese herbal medicines have good antioxidant power. We take this as a thought to study the antioxidant power of Chinese herbal medicines, hoping to develop natural antioxidants from Chinese herbal medicines as a development innovation, low-cost, environmentally friendly and safe raw materials for cosmetics and skin care products.

Materials & Methods:

The materials used in this study include Chinese herbal medicines and chemicals which are described as follows:
Chinese herbal medicine: *Richardia scabra* (Rs), *Taxillus chinensis* (Tc), *Arundo donax* (Ad) and *Anemarrhena asphodeloides* (Aa).

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

Instruments: electronic balance scale coarse scale;(Sartorius/SA07-15US)12R, fine scale: SHMADZU/SA-121A2F-1, electromagnetic heating stirrer (Thermo/SP8857100), 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).

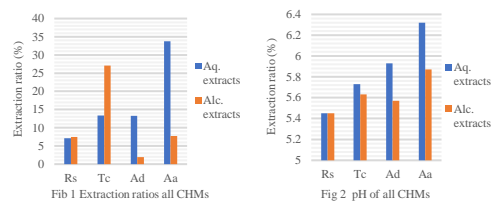
We choose four Chinese herbal medicines to carry out the biological evaluations of water and ethanol extracts of 4 CHMs by simple and widely popular method for screening free radical-scavenging ability and ferric reducing antioxidant power (FRAP), total phenolic content (TPC) and Total flavonoid content (TFC).

Results & Discussion:

Extraction ratio and pH

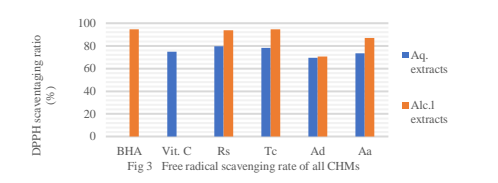
The extraction ratios of all Chinese herbal medicines after microwave extraction alcohol extraction are summarized in Fig. 1.

The pH of Chinese herbal medicine water extracts and ethanol extracts was measured, and the results are shown in Fig. 2.



DPPH free radical scavenging efficacy assay

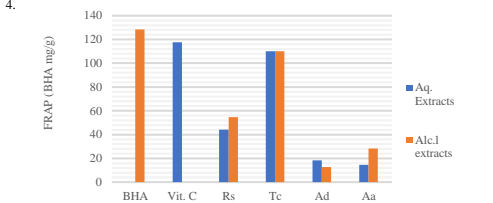
The free radical scavenging ratio of all extracts were summarized in Fig. 3.



Results & Discussion:

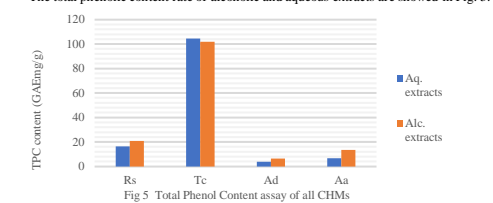
FRAP reducing power Assay:

The reducing power of alcoholic extracts and aqueous extracts are summarized in Fig. 4.



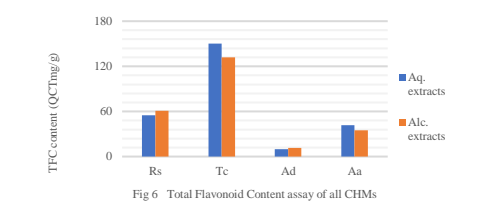
Determination of total phenolic content:

The total phenolic content of alcoholic and aqueous extracts are showed in Fig. 5.



Determination of total flavonoids content :

The total flavonoids content of all extracts are showed in Fig. 6.



Discussion

In this study showed that the antioxidant power of *Taxillus chinensis* is enough to replace vitamin C, and it is a new resource among antioxidants. It can be widely used in skin care products or cosmetics that require "natural", Contributed to environmental protection.

Conclusions:

1. The pH value of all Chinese herbal medicines is weakly acidic, ranging from 5.45 to 6.32.
2. The free radical scavenging of Tc and Rs ethanol extract is similar to that of BHA.
3. The reducing power of Tc aqueous extract had the highest content of total phenols and total flavonoids.
4. Combining with the detection results of total phenols and total flavonoids, and all of them are the highest in Tc.
5. Based on the above results, Tc had the highest extraction ratio, its antioxidant capacity and antioxidant content are both high, and its pH value is between 4.6 and 6.5. It is an excellent antioxidant raw material and can also be used as a reference when developing anti-aging products in the future.

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