Effective Components of the *Prunus Speciosa* Flower Extract on Blue Light Filtration, Whitening and Skin Repair

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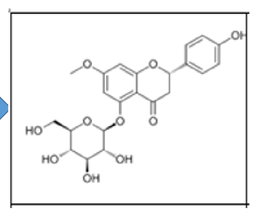
Introduction:

The *Prunus Speciosa Guangzhou, Rosaceae* has shown promising results for skin health. In 2013, the "Guangzhou Cherry Blossom" was named after the city of Guangzhou, China. The single-leafed pink flower is the most weather proof and heat-tolerant of all varieties of Cherry Blossom[1]. Natural active ingredients extracted from Prunus Speciosa Flour (PSFE), such as flavonoids, quercetin, have proved to be the most effective at blue light filtration、skin whitening and repair. Skin adaptive responses help to increase production from light-induced damage. The PSFE achieves the inhibition of tyrosinase activity and melanin content in vitro experiments. In order to study skin barrier effects, sodium lauryl sulfate(SLS) was used to irritate the skin of 3D models to establish an alternative human patch test. At the same time, a clinical trial was conducted using PSFE facial cream twice a day for 28 days. The changes in skin moisture, melanin content and skin elasticity of 20 human subjects were studied.

Materials & Methods:

Natural active ingredient

Extraction

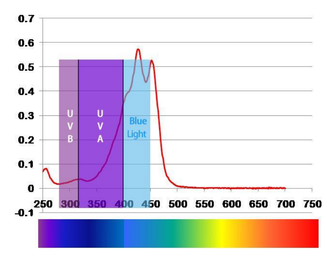


The Cherry Blossom is a flavonoid type of O-glucoside of sakuranetin, which was found in *Prunus Speciosa Guangzhou Rosaceae*.

Demonstration of blue light filtering

The PSFE demonstration of blue pen filtered violet light, as shown in Picture ③, which has a good anti-blue light effect.

High energy visible light



If the blue substance is absorbed in the visible light region, it has a maximum absorption peak at 405nm to effectively filter blue light. The color reflected is the unabsorbed visible light orange, which is the complementary color of the absorbed light 400-500 nm.

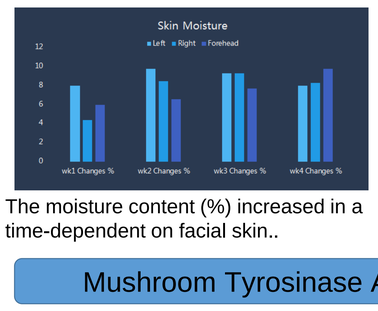
Detection of SPF in vitro

Lahsphere Transimitance Analyzer SPF Report[2]
Data measured at PSFE with UV-1000S In vitro: SPF: 49.83; CW: 381nm;
Boots Star Rating: *** GOOD

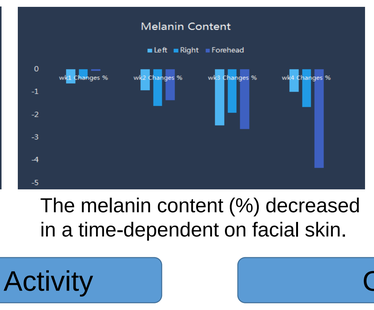
★ The clinic trial applied PSFE facial cream twice daily over a period of 28 days and IRB approved by the Juwenlee Cosmetics Technology Center. Registration number is CNAS L12773, and JWLYF2021-01. The skin moisture, melanin and elasticity tests were carried out with the Cutometer Dual-MPA 580(Courage and Khazaka Electronic,Germany).
★ The tyrosinase inhibition test in vitro was published by Lee K.T. et al[3] in 2003.
★ The MTT assay, tyrosinase activity[4] and melanin production[5] of PSFE was assayed on the B16F10 cells.
★ 3D skin barrier repair effect of skin model of PSFE: Sodium Lauryl Sulfate (SLS) was used to prepare the skin of the model.

Results & Discussion:

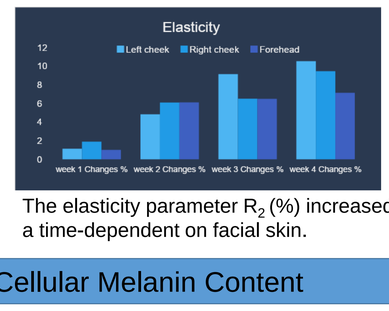
Effect of PSFE cream on facial skin Moisture, Melanin Content and Elasticity



The moisture content (%) increased in a time-dependent on facial skin..



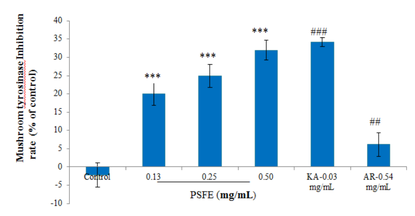
The melanin content (%) decreased in a time-dependent on facial skin.



The elasticity parameter R_2 (%) increased in a time-dependent on facial skin.

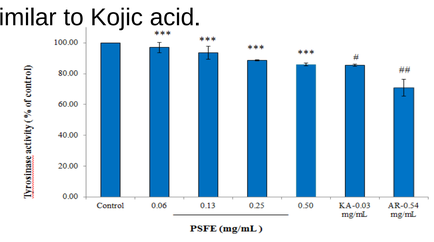
Mushroom Tyrosinase Activity

The results were dose-dependent, the PSFE dose of 0.5mg/mL, which resulted in a tyrosinase inhibition rate of 31.96±2.70%, similar to Kojic acid.



Cellular Melanin Content

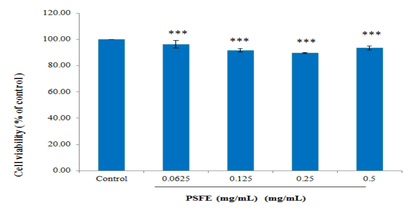
The melanin content was significantly decreased by more than 87.14% after treatments with 0.25 mg/mL PSFE, similar to Kojic acid.



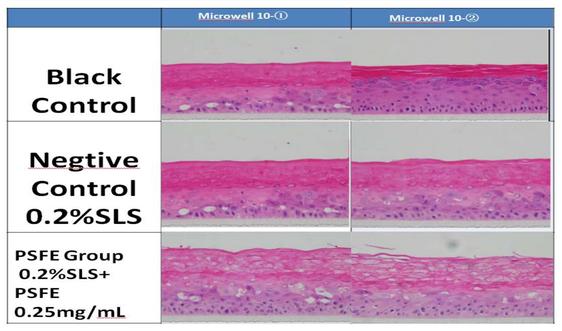
Note: P values * $p < 0.05$ was considered significant, ** $p < 0.01$, *** $p < 0.001$.

Cell Viability Assay of B16F10 cells

The results indicated that PSFE had no cytotoxic effect.

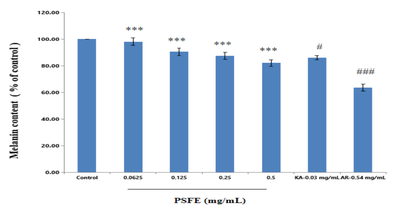


3D skin repair model by H&E staining



Cellular Tyrosinase Inhibitory Effects

PSFE showed that the cellular tyrosinase activity was decreased by more than 85.97% after treatments with 0.5 mg/mL PSFE, similar to Kojic acid.



The model results showed that compared with the BC group, the NC group Microwell 10-① caused skin structure damage after 0.2%SLS was immersed in the living cell layer, causing the four-layer structure of the epidermis to be inconspicuous, and abnormalities. Compared with the NC group Microwell 10-①, the PSFE group Microwell 10-② did not significantly improve the fluffy and thickening of the stratum corneum, the damage to the living cell layer was not significantly improved, but the number of normal cells increased, the pyknosis and disappearance of the nucleus were not obvious, and no vacuoles appeared.

In these studies, the skin moisture increased, melanin content decreased, and elasticity increased in a time-dependent pattern. The maximum changes occurred within four weeks. In addition, we evaluated the effects of PSFE on tyrosinase activity and melanin production to determine their whitening function. By using the HE stainning test, and after applying SLS to damage skin structure, use of PSFE resulted in the repair of multiple layers of the epidermis. We was supposed to to find an effective drug ingredient to compare the efficacy of the PSFE.

Conclusions:

This is the first report about the skin care effects of Prunus Speciosa Flower Extract (PSFE), using human clinical trials that demonstrate changes of skin moisture content, melanin content and skin elasticity. PSFE has good blue light filtering properties and inhibits tyrosinase activity, which achieves a whitening effect. This is the first report about the morphological analysis of PSFE on an animal replacement study. Thus, PSFE shows promising performance as a functional ingredient for photoaging defence and inflammation relief in skin repair products. With current concern for social responsibility, it is necessary for products to contain natural ingredients that are safe for humans and the environment. However, it remains important that products are effective and readily available for production. The study and analysis of PSFE provides many possibilities in skin care.

Aknowledgments:

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References:

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