Lemon Skin™

natural skin lightening
antioxidant protection + anti-aging benefits
lemon peel derived
perfect for evening skin tone for a radiant appearance!

BACKGROUND

Man has cultivated lemons for so long it is no longer clear when it began. However it is clear that lemons originally were produced in Asia and slowly propagated westward. Researchers debate if lemons were initially produced in the Malay Archipelago or in the Yunnan province of China. Regardless, lemons are widely cultivated.

Citrus limonum is one of the world's most important food crops. The juice from the fruit is widely used as a beverage and as a condiment. The rind is used to produce lemon oil, while the remaining skin and pulp may be used as livestock feed.

SCIENCE

The medicinal virtue of lemons, specifically the citron, is clearly evidenced by its Latin name – *Citrus medica*. Traditionally in cosmetics, lemons have been used as a source of the alpha-hydroxyacid (AHA) citric acid. Typically lemon juice contains between 5 and 8 percent citric acid. The most obvious medicinal use of lemon was as a source of Vitamin C to prevent scurvy. Owing to its high level of Vitamin C, fresh lemon juice has been recommended in some herbals as a treatment for sunburn, perhaps not the most sensorially pleasing approach, but not without merit. Given its relatively high acid content, coupled with antioxidant activity, it is obvious why lemon juice has been promoted as a natural skin lightener.

As early as 1986 researchers began demonstrating some interesting properties from the peel of the lemon. Kroyer showed that the hesperidin and naringin are principally responsible for the significant antioxidant properties of citrus peel[1]. In 2000, the University of Arizona published a study where they were able to correlate consumption of citrus peel with a reduction in squamous cell carinoma[2]. Coincidentally, Arizona is one of the predominant producers of lemon in the US. Recently a group of researchers in Taiwan, looking to develop a commercial usage for lemon peels, discovered that the peel itself has some potent anti-tyrosinase activity[3].

INCI Name: Lactobacillus/Lemon Peel Ferment Extract
INCI Status: Conforms
REACH Status: Compliant
CAS Number: 84929-31-7
EINCS Number: 284-515-8

Origin: Botanical
Processing:
GMO Free
No Ethoxylation
No Irradation
No Sulphonation
Additives:
Preservatives: None
Antioxidants: None
Other additives: None
Solvents Used: Glycerin & Water
Appearance: Clear to Slightly Hazy Liquid
Soluble/ Miscible: Water
Ecological Information:
100% Biodegradability
Microbial Count:
< 100opg, No Pathogens

Suggested Use Levels: 0.5 – 2.0%
Suggested Applications: Skin Lightening, Evens Skin Tone, Antioxidant

Benefits of **Lemon Peel**:

- Antioxidant
- Natural Skin Lightening
- Evens Skin Tone
- Anti-Aging

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BENEFITS

Using our traditional biofermentation approach we macerated the lemon and incubated it with *Lactobacillus lactis*. We then carried out further isolation methods to specifically remove potential allergens such as citral and geraniol. Most skin care formulations today are developed as multifunctional products, often times tackling more than one skin condition at a time.

Balancing skin tone is an important aspect to address when developing cosmetic skin treatments, as is providing an antioxidant rich formulation. As stated previously, the fruit of the lemon has long been used for its,strong anti-oxidant benefits while more recently the peel has been found to possess strong anti-tyrosinase activity. Using **Lemon Peel** in cosmetic and personal care applications is an excellent way to capitalize on the desire for using botanicals ingredients while also helping to balance skin tone.

EFFICACY

Efficacy testing confirms that **Lemon Peel** is a natural and effective alternative to hydroquinone for inhibiting tyrosinase production.

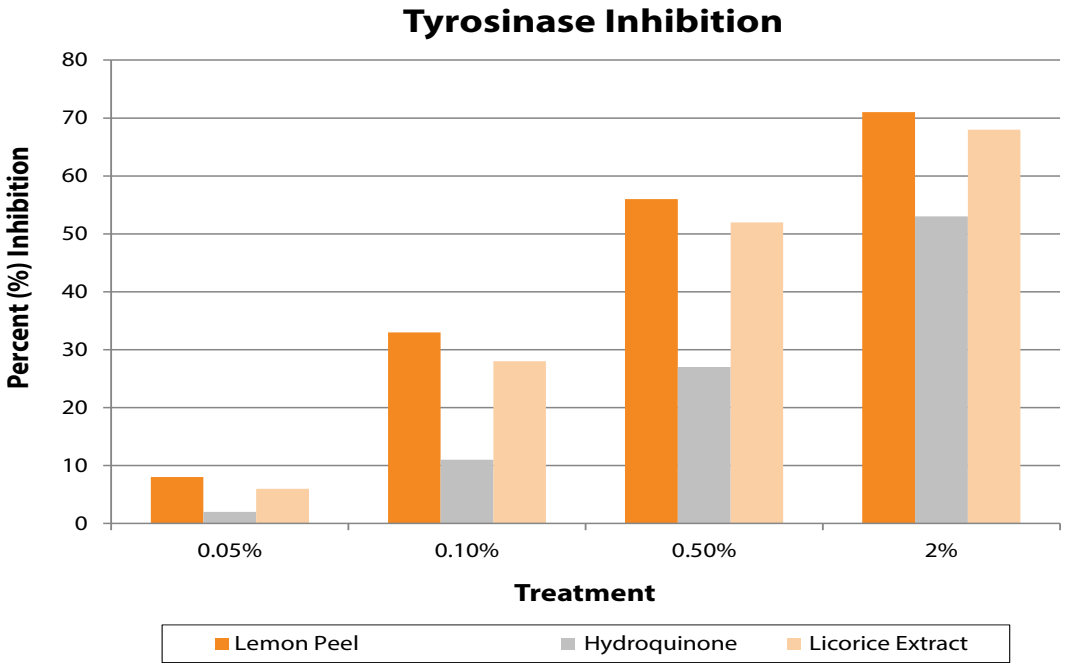

Figure 1. Results of the tyrosinase inhibition following application of Lemon Peel

References:

1) Kroyer G. (1986) "The antioxidant activity of citrus fruit peels" Z Ernahrungswiss. 1986 Mar;25(1):63-9.
2) Hakim, I.A. and Harris, R.B. (2000) "Citrus peel use is associated with reduced risk of squamous cell carcinoma of the skin" Nutricional Journal. Nutrition and Cancer.2000;37(2):161-8.
3) Kim, H.G, *et al.* (2011) "Flavonoid profiling in three citrus varieties native to the Republic of Korea using liquid chromatography coupled with tandem mass spectrometry: contribution to overall antioxidant activity" Biomedical Chromatography. 2011 Aug 9. doi: 10.1002/bmc.1688