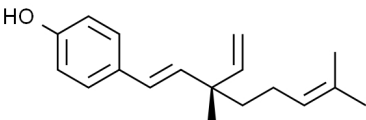


Introduction of Bakuchiol

1. Bakuchiol Overview

Bakuchiol is a new, natural cosmetics ingredient for anti-aging and skin irritation relieving. It also is a great alternative for retinol, because it's more mild than retinol for sensitive skin. Bakuchiol is obtained from the seed of plant *psoralea corylifolia*. Plamed develops high purity Bakuchiol of 98%. Studies have shown that Bakuchiol has an effect of anti-aging. It can enhance the activity of human skin fibroblasts and promote the synthesis of skin collagen, thus achieving its anti-aging effect. Moreover, it can significantly reduce UV-induced skin damage, such as pigmentation. So Bakuchiol is an effective skin-whitening raw material.

In recent years, there have been more and more researches on Bakuchiol, and its effect on beauty and skin care has also attracted wide attention. Bakuchiol is an active cosmetic ingredient with great potential and multiple effects.

Product Name	CAS Number	INCI Name	
Bakuchiol	10309-37-2	BAKUCHIOL	
Molecular Weight	Molecular Formula	Molecular Structure	
C ₁₈ H ₂₄ O	256.38g/mol		
Product ID	Specification	Minimal Package	Minimal Order Quantity
PMKZ1501	98%	1KG	1KG

2. Bakuchiol Source

Psoralea corylifolia, also named babchi, is an annual plant, usually used in Indian and Chinese traditional medicine. It is distributed in China, India, Burma and Sri Lanka. The plant grows on a hillside, by a stream or by a field. Its seeds mainly contain coumarins, including psoralen and isopsoralen. Bakuchiol is extracted from babchi's seed.



3. Bakuchiol Manufacturer Specifications

Items	Specification
Bakuchiol	98%
Organoleptic Tests	
Appearance	Brown liquid
Odor	Characteristic
Taste	Characteristic
Physical Characteristics	
Moisture	$\leq 1.0\%$
Ash content	$\leq 1.0\%$
Heavy Metals	
Total heavy metals	$\leq 10\text{ppm}$
Pb	$\leq 2\text{ppm}$
As	$\leq 2\text{ppm}$
Hg	$\leq 1\text{ppm}$
Cd	$\leq 5\text{ppm}$
Microbiological Tests	
Total of bacteria	$\leq 1000\text{cfu/g}$
Yeast & mold	$\leq 100\text{cfu/g}$
Thermotolerant coliforms	Negative
P.Aeruginosa	Negative
Staphylococcus aureus	Negative

4. Bakuchiol Benefits

◆ Anti-aging

The study has been shown that Bakuchiol can enhance fibroblastic activity in skin, increase TIMP-2 , and decrease MMP-1. Thus it can reduce the breakdown of collagen in skin, and promote collagen 's synthesis, then achieving its anti-aging effect. Also, Bakuchiol is able to promote the proliferation of ESF-1 cells and collagen 's expression, and to inhibit the expression of matrix metalloproteinase mRNA, so as to play an anti-aging effect on the skin.

After 12 weeks of treatment with bakuchiol, the subjects' skin wrinkles and pigmentation were significantly improved. There was no any adverse reactions on skin.

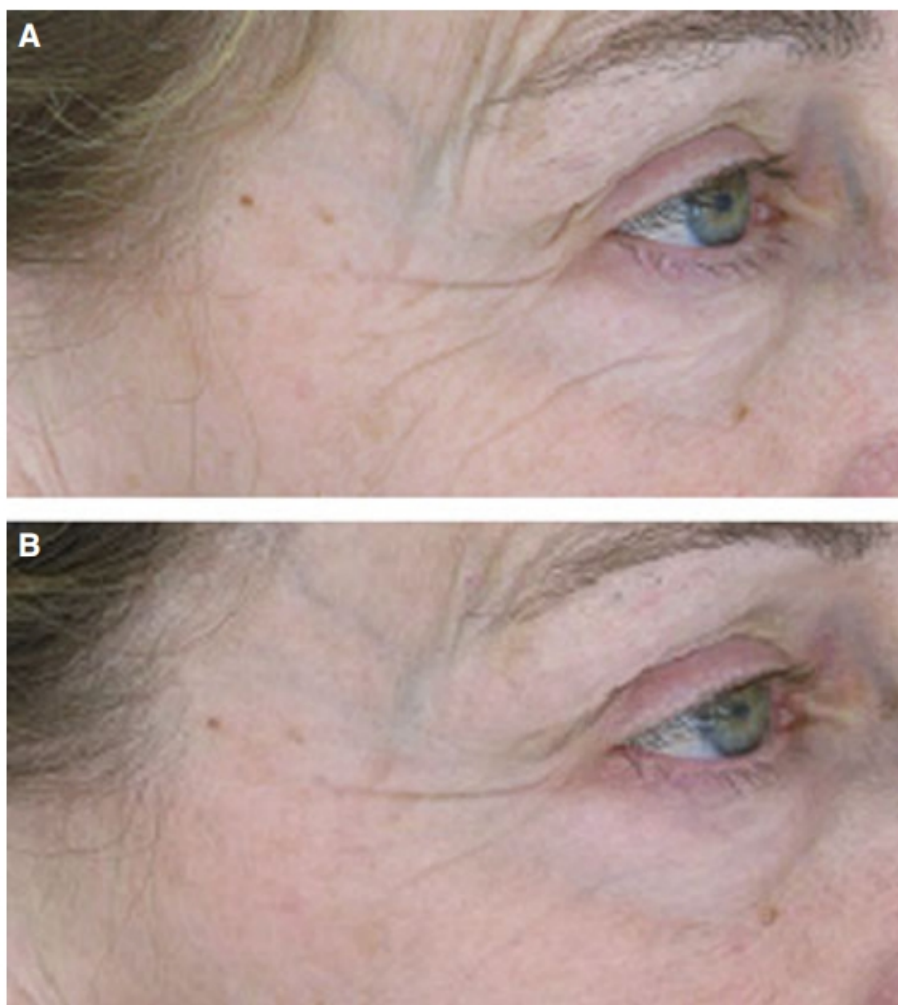


Figure: Before and After Treatment with Bakuchiol for 12 Weeks

◆ Anti-inflammation

Bakuchiol can inhibit nucleic acid synthesis by degrading DNA helix and topoisomerase II enzyme activity, thereby hindering DNA biosynthesis and eventually leading to bacterial deathis. It is also

known to be an effective in reducing acne especially when combined with salicylic acid, which results in a synergistic and effective treatment of acne.

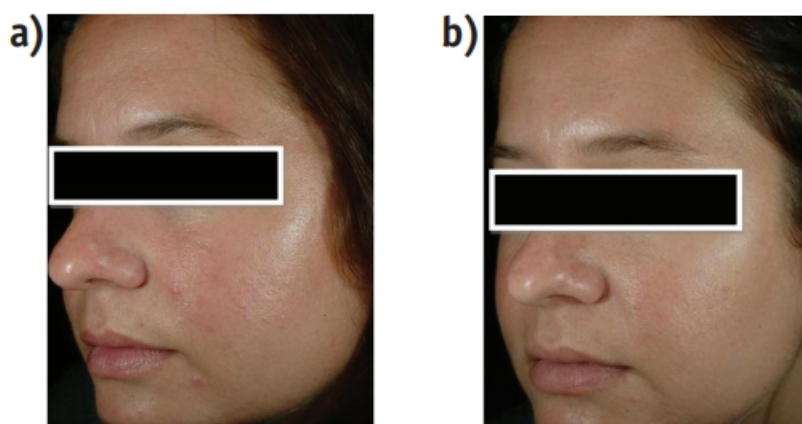


Figure: Treatment with 1% bakuchiol lotion a) at baseline, and b) after six weeks of treatment

◆ Skin-Whitening

Bakuchiol mainly affects the activities of tyrosine monophenolase and diphenolase. Studies have found that in the low concentration range, Bakuchiol has a more pronounced inhibitory effect on tyrosinase than arbutin, which has become a potential natural tyrosinase inhibitors.

Compounds	Melanin EC ₅₀ (μg/ml)	Cell viability IC ₅₀ (μg/ml)
Bakuchiol (1)	1.8	5.9
Bavachin (2)	1.8	17.5
Isobavachalcone (3)	2.3	17.5
Arbutin	24.0	>1000

Figure: Skin-Whitening Effect of Bakuchiol

5. Study on the Pharmacology of Bakuchiol and Cosmetics

Test item	Concentration	Result
Inhibition to tyrosinase activity	/	IC ₅₀ : 12.1μg/mL
Inhibition to collagen protease activity	/	IC ₅₀ : 0.1% or so
Inhibition to myeloperoxidase	/	IC ₅₀ : : 0.1μmol/L
Inhibition to prostaglandin PGE ₂	0.1μmol/L	Inhibition rate: 33.8%
Inhibition to ear swelling in mice	1%	Inhibition rate: 5.74%
Inhibition to pigmentation by SPF method	1%	Inhibition rate: 2.86%

6. Plamed Bakuchiol Characteristic

- Plamed Bakuchiol has good stability and little side effect.
- Plamed Bakuchiol is 100% natural extraction with high purity.

7. Bakuchiol Application & Reference Dosage

Bakuchiol is widely used in anti-aging, anti-acne and skin-whitening cosmetics, including spray, toner, lotion, essence, face cream, sunscreen, etc.

Application Product	Reference Dosage
Toner, lotion, essence, face cream, sunscreen, etc.	0.5-2%

Note:

- Bakuchiol can be paired with salicylic acid to treat acne, used in skin care product.

Group #	Type of lotions	No. of volunteers	% reduction in acne		
			after 2 weeks	after 4 weeks	after 6 weeks
1	1% bakuchiol	13*	30	42	57
2	2% salicylic acid	14**	21	34	48
3	1% bakuchiol (and) 2% salicylic acid	14*	26	48	67
4	Control	15	5	5	11

*Two drop-out due to protocol violation ** One drop-out due to protocol violation

Figure: Bakuchiol combined with salicylic acid for anti-acne

- Bakuchiol has no photo-sensitivity for skin; it's more tolerant than Retinol.

Bakuchiol application cases in major cosmetic brands in the world:

Country	Brand	Product
China	REN Bio Retinoid	Anti-wrinkle Concentration Oil Anti-aging Cream
America	Kate Somerville	Dermalquench Liquid Lift + Retinol Retinol firming eye cream
	Paula's Choice	Clinical 0.3% Retinol + 2% Bakuchiol Serum
German	Sepai	Flawless Dark Spots Serum Sublime Youth Oil Flawless Body Secret
France	Noreva	Exfoliac Global 6 Intensive Care
	Bioderma	Sebium global intensive purifying care acne-prone skin

8. Bakuchiol Reference Formula

Anti-acne gel:

Ingredient	Content (%)	Ingredient	Content (%)
Bakuchiol	1.0	Hydroxyethyl Cellulose	0.5
EDTA	1.0	Nalidone	0.2
Butanediol	1.0	Salicylic Acid	2.0
Glycollic Acid	10.0	Lactic Acid	0.3
Sodium Hydroxide	1.0	Perilla Ocymoides Leaf Extract	2.0
Olive Fruit Extract	0.5	Polysorbate	1.0
Bisabol	0.2	Deionized Water	Add to 100

9. Bakuchiol Safety

- ✧ CTFA (Cosmetic, Toiletry & Fragrance Association) has listed Bakuchiol as cosmetics raw material.
- ✧ Bakuchiol is listed on *The International Catalogue of Chinese Cosmetic Raw Materials Standards* in 2010 issued by CAFFCI. There is no insecurity for its external use.
- ✧ Bakuchiol has low irritation and high safety. It can be added safely in skin care products.

10. Package and Storage

1. Sample bottles are 30ml and 50ml glass bottles.
2. The products in small batches are packed in 1kg, 5kg and 10kg PE bottles.
3. The outer packing of large quantity products is 200L bucket.

Sample



1KG



5-10KG



200KG

