

Bakuchiol



- **INCI Name** **Bakuchiol**
- **CAS No.** **10309-37-2**

Introduction

Bakuchiol, a natural skin care ingredient derived from bakuchiol seeds, is obtained from the babchi plant (*Psoralea corylifolia*). It can significantly improve skin elasticity, firmness, pigmentation and hydration. All these can occur without dryness or skin flakiness. It was also found to have effect on collagen and elastin, two of the skin's most precious proteins. It has proven to suppress melanin and increase skin firmness by regulating types I, II and IV collagen all to reduce fine lines and wrinkles.

Botanical Source: *Psoralea corylifolia* L.

Part used: Seeds

Extract solvent: Ethanol

Appearance: Brownish red viscous liquid

Solubility: Soluble in methanol, ethanol, acetone, ethyl acetate, petroleum ether, chloroform, etc.

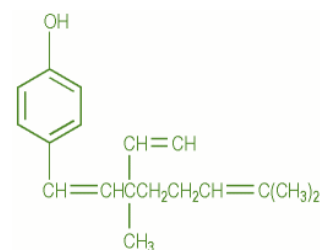
Specification: Bakuchiol 90.0%, 98.0%

Test method: HPLC

Functions

By stimulates key anti-aging genes

- ✓ Anti-inflammatory, Antibacterial, Antioxidant
- ✓ Resist hyper oxidative free radical
- ✓ Skin whitening and improving pigmentation after inflammation



Structure of Bakuchiol

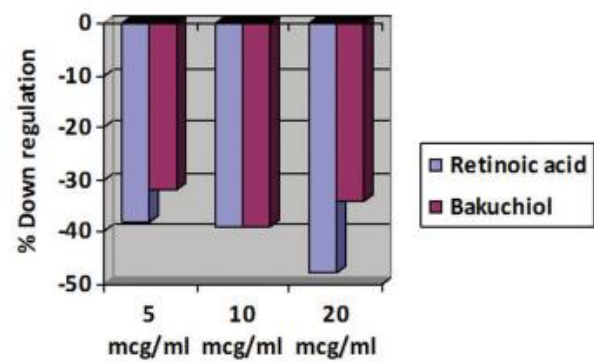
Application

- Bakuchiol has unique anti-oxidation effect. It is widely used in cosmetic products. It was included in the European cosmetic material list in 1998, and included in INCI list in 2009. It generally conjunctive used with other active substances as smoother and protector of skin.
- In cosmetic products, Bakuchiol can be used in cream, emulsion, gel, mask, cleanser, toner, etc. as a skin conditioner.
- Bakuchiol has significant effect on acne and pigmentation after acne inflammation.

Efficacy Data (comes from literature)

► Effective in down-regulating the formation of 5-α-reductase

The enzyme 5-α-reductase converts testosterone to DHT, which binds to androgen receptors on the sebaceous glands and causes excessive oil production. Excess oil obstructs the skin pores, allowing bacterial growth that causes inflammation, infection and visible acne.



✓ At 10 µg/mL, both bakuchiol and retinoic acid showed approximately 40% reductions in 5-α-reductase expression, compared with the placebo.

► Excellent P. acnes and other microorganisms’ inhibitory activity

Broad antibacterial/antifungal activities are also desired for anti-acne treatments since affected skin has shown much higher levels of Staphylococcus and Candida.

Table 1. Comparative P. acnes inhibitory activity of bakuchiol and salicylic acid*		
Product Composition	Amount (µg/mL)	Zone of inhibition (mm)
Bakuchiol	0.6 (IC ₅₀)**	37
Bakuchiol	0.3	35
Salicylic acid	29.6 (IC ₅₀)**	12
Salicylic acid	14.8	No inhibition
Salicylic acid	58	12
Bakuchiol + Salicylic acid	0.3 + 14.8	27
Bakuchiol + Salicylic acid	0.6 + 29.6	46
Bakuchiol + Salicylic acid	0.6 + 59.2	60
Bakuchiol + Salicylic acid	0.6 + 148	62

* Zone of inhibition in mm at 48 hr, incubation at 37°C

** The inhibitory concentration (IC₅₀) of bakuchiol and salicylic acid were defined as the inhibitory concentration of a product limiting the turbidity to < 0.02 AU at 610nm.

✓ The minimum inhibitory concentrations (MIC, in µg/mL) of bakuchiol were 1µg/mL for Staphylococcus aureus, 2 µg/mL for S. epidermidis and 1.5µg/mL for Candida albicans.

Further, while salicylic acid is a poor inhibitor of P. acnes, at certain concentrations, bakuchiol in combination with salicylic acid was found to be synergistic in inhibiting P. acnes (see Table 1).

► Broad-spectrum antioxidant activity

Table 2. Antioxidant profile of bakuchiol						
	Peroxyl ¹	Hydroxyl ²	Superoxide ³	Peroxynitrile ¹	Singlet oxygen ⁴	Lipid peroxidation ⁵
Bakuchiol	15,165	74	10.18	130	265	0.5
Tocopherol natural	813	None	None	1	220	30
Note: This work was carried out by Brunswick Laboratories, Norton, MA USA.						
¹ μmole Trolox equivalent/g; Oxygen Radical Absorption Capacity (ORAClipo)						
² μmole caffeic acid equivalent/g						
³ Kilo unit SOD equivalent/g						
⁴ Singlet oxygen was generated by using H ₂ O ₂ + molybdate anion; data is expressed in IC ₅₀ in μg/mL.						
⁵ Squalene was used for lipid peroxidation inhibitory activity; data is expressed in IC ₅₀ in μg/mL.						

✓ *Bakuchiol can effectively quench superoxide-, hydroxy-, peroxy-, peroxynitrile radicals and singlet oxygen non-radicals in addition to inhibiting lipid peroxidation (see Table 2).*

► Effective in reducing acne especially combined with salicylic acid

The percent reduction in acne using the Global Acne Grading System is summarized in Table 3.

Table 3. Percent reduction in acne after product treatment					
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					

✓ *Based on the results, formulations containing 1% bakuchiol (and) 2% salicylic acid showed a nearly 70% reduction in acne lesions and inflammation, as judged by the acne grading system. The next best results were with 1% bakuchiol, which reduced acne by a score of about 57%, whereas 2% salicylic acid only reduced acne by about 48%. As expected, the control group provided practically no improvement in the reduction of acne. None of the subjects observed or reported any adverse reaction using these formulated products.*