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CLINICAL COMMENTARY

Finding the right Bakuchiol: Choose wisely

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1 | FINDING THE RIGHT BAKUCHIOL: CHOOSE WISELY

Psoralea corylifolia also referred to as the Babchi or Bakuchi plant is a plant grown mostly in India and China that has been shown to have medicinal properties through their anti-oxidant activity.[1] [Correction added on 9th March 2023, after first online publication: In the previous sentence "an endangered" was changed to "a."] The plant contains may chemically active compounds including flavonoids, coumarins (psoralidin, psoralen, isopsoralen and angelicin) and meroterpenes such as bakuchiol and 3-hydroxybakuchiol.[2] Several parts of the plant can be used, either topically or internally, including the root, the stem, the leaves, and the seeds. The different variations include Babchi plant extract, whole Babchi plant, Bakuchi oil and the phytochemical bakuchiol, which is contained within the Babchi plant (Table 1). The topical seed oil has frequently been used in treatments for psoriasis and other conditions affecting the skin.[1]

Bakuchiol is a meroterpene phenol, which is sourced from the seeds of *Psoralea corylifolia*, that has anti-inflammatory, antimicrobial and anti-proliferative properties. It has recently gained increased popularity for use in anti-aging products amongst others, comparative to retinol[3]; however, bakuchiol is a natural alternative and lacks the photosensitive effects.[4] Backuchiol must be properly isolated from the Babchi plant, which proposes a limitation due to differing levels of purity in the isolated component. The isolation is difficult because there are low concentrations in natural sources.

The co-existence of phototoxic components in the Babchi plant increases the potential for ultraviolet radiation related effects when these constituents are not removed. For example, the presence of psoralens and isopsoralens will increase the photosensitivity when they are applied topically. While psoralens may be beneficial when used for conditions such as vitiligo or psoriasis when used in conjunction with phototherapy, when used for facial care, the presence of psoralens can have unintended effects by causing psoralen-based photosensitivity. For this reason, the use of an isolated and purified compound such as bakuchiol may eliminate this risk.[5] Furthermore, the leaf, root, and stems of *P. corylifolia* contain furocoumarins.[6] Skin photosensitivity is a well-known property of furocoumarins when exposed to sunlight demonstrates varied levels of erythema, pigmentation and damage to human skin after a latent period.[7] Due to these phototoxic side effects, it is important to have purified isolates of bakuchiol rather than unpurified extractions of *P. corylifolia* when considering facial care.

Overall, bakuchiol is a component extracted from the *P. corylifolia* plant and has been shown to have retinol-like properties. For this reason, many companies are using bakuchiol in their products. However, not all products may have the purified form of bakuchiol. The extraction process of bakuchiol from the Psoralea plant requires purification through liquid–liquid partitioning, and column chromatography followed by characterization of the isolated product via nucleic magnetic resonance (NMR) as well as gas chromatography and mass spectrometry (GCMS).[8] Based on the complex isolation process, bakuchiol may be extracted in a less pure form such as the compound of bakuchiol as a racemic mixture, a whole plant *P. corylifolia* extract, or as bakuchi oil. Consumers may not be aware of these impurities which can increase exposure

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TABLE 1 Forms of bakuchiol added to products and the possible related side effects.

Sources of bakuchiol	Side effects
Bakuchiol – pure	Slight redness after initial use[9]
Bakuchiol – less pure	Contact Dermatitis, photosensitivity[10]
P. corylifolia (Babchi) plant extract	Photosensitivity with erythema and blistering[11]
Whole *P. corylifolia* (Babchi) plant	Photosensitivity with erythema and blistering along with acute dermatitis[12]
Bakuchi/Babchi oil	Phytophotodermatitis- phototoxic reaction with pain and erythema that may progress to bullous eruption[13]

to phototoxic psoralens and furocoumarins. Therefore, consumers should choose wisely when considering bakuchiol containing products and look for purified bakuchiol sources in their facial care products.

AUTHOR CONTRIBUTIONS

Study conception, literature search, manuscript draft, critical revisions: Najiba Afzal; critical revisions: Raja Sivamani. All authors reviewed and approved the final version of the manuscript.

CONFLICT OF INTEREST STATEMENT

Najiba Azfal declares no conflicts of interest. Raja Siavmani serves as a scientific advisor for LearnHealth, Codex Labs Corp, and Arbonne and as a consultant to Burt's Bees, Novozymes, Nutrafol, Incyte, Fotona, Biogena, Bristol Myer Squibb, Novartis, Element Apothec, Abbvie, Leo, UCB, Sun, Sanofi, Regeneron Pharmaceuticals.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

ETHICAL APPROVAL

Authors declare human ethics approval was not needed for this study.

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