LEBENSMITTELCHEMISCHE GESELLSCHAFT

- Fachgruppe in der GESELLSCHAFT DEUTSCHER CHEMIKER -
Arbeitsgruppe Kosmetische Mittel

Data sheets for the evaluation of the effectiveness of active ingredients in cosmetic products

Propolis

1. Definition

Propolis is the putty resin of the honeybee, coming mainly from the resinous secretions of trees and shrubs (bud scales) and is mixed by the bee with the body's own glandular secretions.

2. Raw materials used in cosmetic products

Raw material	CAS Nr.	INCI-Name [1, 2]
Propolis wax Propolis extract	85665-41-4	PROPOLIS CERA, PROPOLIS WAX PROPOLIS EXTRACT

3. Components

Propolis consists mainly of waxes and resins (approx. 80%). In addition, small amounts of essential oils, phenolic substances, phenylpropenoic acids, pollen and inorganic substances (up to 5% each) are present. The composition of propolis is subject to strong fluctuations depending on vegetation, season, climate and local conditions [3-5]. The following table provides an overview.

Group of substances	Proportion in raw propolis [5]

Hydrocarbons, waxes, high molecular weight esters, ethers and ketones, higher fatty acids, steroids	5-40%
Polyphenols: Chalcones, dihydroxychalcones, flavones, flavanones, flavonols, flavonoids	5-50%
Aromatic acids and their esters with alcohols, terpenoids, alcohols, aldehydes, ketones	1-25%
Amino acids, sugar, vitamins, minerals	1-10%

Propolis can also contain small amounts of tocopherols (tocotrienols) [6].

4. Effects described

The antibacterial (mainly against gram-positive bacteria) and antifungal effects of propolis have been proven [3 - 4, 7 - 10]. The anesthetic potential is significantly higher than that of novocaine [7]. The antimicrobial effect correlates with the content of phenyl-substituted carboxylic acids (caffeic acid, ferulic acid, benzoic acid and its esters) [4, 11, 12]. High levels of flavonoids (galangin, pinocembrin, pinostrobin, quercetin and kaempferol) enhance this effect [4, 10, 12].
Antioxidant properties have also been described for propolis [13 - 15]. The antioxidant effect depends on the content of phenolic compounds, in particular caffeic acid phenethyl ester, and tocopherols [14, 15].
However, it must be taken into account that the various compounds have different antimicrobial and antioxidant efficacy.

5. Concentrations of use and effects

Cosmetic preparations containing propolis are used in skincare and oral care products in particular due to their antimicrobial effect [14, 16]. In addition, it plays a certain role in toothpaste [16, 17].

Unlike other extracts from natural raw materials, such as chamomile extracts and tea tree oil, neither the propolis extract nor the wax have yet been pharmaceutically standardised with regard to effective ingredients [4]. Due to the highly varying composition, detailed product-related recommendations for use cannot be given for either propolis wax or the extract with regard to the cosmetically effective concentrations.

6. Additional considerations

Due to the strongly fluctuating composition of propolis wax and extract, attention should be paid to the associated variations in efficacy and tolerability.

Topical application can lead to an allergic reaction (type IV allergy, contact dermatitis) [18, 19]. Cinnamic acid derivatives, benzyl salicylate and cinnamaldehyde have been identified as allergens in propolis [4, 17, 20]. Particular attention should be paid to this aspect in the safety assessment. This may result in the need for a consumer warning.

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Obmann: Dr. Bernhard Fellenberg, BAV INSTITUT GmbH, Hanns-Martin-Schleyer-Straße 25, 77656 Offenburg
Tel: +49 (0)781 96947-194; E-Mail: bernhard.fellenberg@bav-institut.de
Geschäftsstelle: Gesellschaft Deutscher Chemiker, Varrentrappstrasse 40-42, 60486 Frankfurt am Main