

Black BeeOme™

Mibelle Biochemistry presents a Black bee honey ferment to restore the skin's natural microflora

The recently launched Black BeeOme™ results from the fermentation honey from the rare dark bee (*Apis mellifera mellifera*) with the bacteria *Zymomonas mobilis* and has been designed to harmonize the skin microflora after stress to ensure a healthy and pure skin.

The Cutaneous Microbiota

Traditionally, the pathogenic potential of microorganisms hosted on the human skin has put the medical emphasis on how to remove these organisms. However, research in recent years through microbiome studies has revealed that the microbes on the skin are a vital part of the host-microbiota symbiotic system, which suggests that skin commensals play important roles in terms of maintaining skin health and proper function. This new view appeals for a paradigm-shifting acknowledgment of the functions of the skin microorganisms in skin health and new treatment strategies for microorganism-associated skin diseases.

The most recent research has revealed the complexity of this field as the amount and type of microbes varies significantly between different subjects, and between different skin areas within one person. In general, it is believed that the broader the variety of microbes at a specific skin site, the better it is for the health of the skin. A disruption of this skin ecosystem may not only influence diseases such as psoriasis or acne, but also skin ageing, barrier function and wellbeing.

The fermentation of black bee honey with *Zymomonas mobilis*

Honey has been used since ancient times as food and subsequently in cosmetics. However, the production of honey has been endangered lately as bee populations have significantly decreased because of diseases. In tune with the valleys of Switzerland, the dark bee *Apis mellifera mellifera* has adapted to survive adverse conditions. It is only this very special breed that is resistant to varroa (the mite that attacks bees), which is one of the reasons identified for the worldwide bee population decline. The honey made by these special wild dark bees has been used by Mibelle Biochemistry as a fermentation substrate in the new active Black BeeOme™.

For more than 1,000 years *Zymomonas mobilis* was used by the Aztecs to make the Mexican 'drink of the Gods' pulque. This ancient drink is the forerunner of mescal and tequila. All three drinks come from the same family of plants, but pulque is made by fermenting – as opposed to distilling – the sap of the agave with *Zymomonas mobilis* (amongst other ingredients). These bacteria can ferment only sucrose, glucose and fructose, leaving the complex sugars intact.

The black bee honey is fermented with *Zymomonas mobilis* to eliminate the basic sugars (glucose, fructose and sucrose), thereby eliminating a carbon source for glycation and unwanted bacterial growth on the skin. The ferment of *Zymomonas mobilis* also contains factors that may help to control the growth of bacteria, yeast and fungi on the skin.

The Prebiotic Action of Black BeeOme™

Under normal conditions, the microbiotic film protects the skin against other harmful bacteria or pathogens. As it is the first barrier, this film is constantly stressed not only by factors such as UV light, pollution and domestic chemicals, but also by cosmetic products or treatments. This dynamic creates an imbalance in the skin microflora and their niches may later be colonized by transient, harmful bacteria. Frequent washing



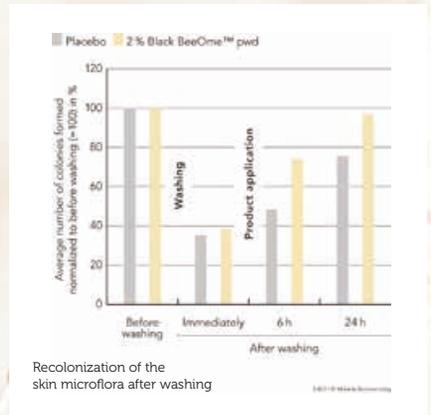
of the skin, for example, can reduce and unbalance the skin's ecosystem. Therefore, the skin microbiota must recover from these threats on a daily basis. A healthy barrier should not require extensive treatment but should support an innate ability to bounce back to normal homeostasis after being challenged. Black BeeOme™ has been shown to efficiently exert its prebiotic effect: incorporating nutrients and generating conditions to restore the healthy skin's natural microbiota following daily stress.

Skin Barrier Enhancing Effect

The skin integrity recovery effect of Black BeeOme™ was evaluated in a double-blind placebo-controlled clinical study. The test products, a gel containing 1% Black BeeOme™ pwd and the corresponding placebo were applied to the skin after a harsh wash. The test parameters TEWL and erythema were determined at different time points. The results revealed that the application of 1% Black BeeOme™ pwd protected and reinforced the recovery of the skin barrier. The faster recovery of the skin ecosystem had a positive influence on the skin barrier regeneration as seen by the reduction of TEWL compared to the placebo. After the stress phase, the decrease of redness on the skin areas treated with the product containing 1% Black BeeOme™ pwd was faster than that on the placebo-treated skin.

Support of the Skin Flora Recovery after Washing

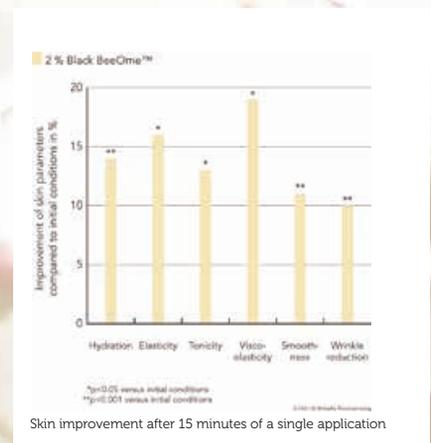
In a placebo-controlled clinical study the skin microflora recolonization efficacy of Black BeeOme™ pwd was determined. The volunteers applied a single application of water spray containing 2% Black BeeOme™ pwd after washing the skin with an SDS/Ethanol mixture to strip the skin of its microflora. To determine the number of microorganisms, skin surface samples were taken with contact plates from volunteers before and immediately after the washing, then after 6 hours,



Recolonization of the skin microflora after washing

in TEWL was significant. Additionally, a 6.8% reduction in sebum production was achieved and a 9% increase in skin evenness compared to the placebo and to initial conditions.

Improvement of Impure Skin in



Skin improvement after 15 minutes of a single application

Urban Areas

To investigate the efficacy of Black BeeOme™ on the improvement of various skin parameters in urban areas, a clinical study was conducted in Bangkok on female volunteers with impure and oily skin. The volunteers applied a sheet mask containing 2% Black BeeOme™ for 20 minutes, once daily over a period of 3 days. Results showed that 15 minutes after a single treatment with 2% Black BeeOme™, a significant improvement was achieved in all parameters compared to initial conditions.

The parameters that characterise impure and oily skin associated with urban and polluted living areas were reduced after 3 days using the sheet mask: 12% reduction in inflammatory lesions and a 9% reduction in retentional lesions.

and then after 24 hours. Results showed that harsh washing had a detrimental impact on the skin microflora layer. However, the skin treated with 2% Black BeeOme™ pwd was able to recover faster from the washing than the placebo. The reestablishment of the skin's natural microflora was achieved sooner following the use of Black BeeOme™ pwd.

Skin Barrier and Overall Improvement of Impure Skin

The efficacy of Black BeeOme™ pwd was investigated in a randomized, placebo-controlled clinical study. The tested products, a gel containing 1% Black BeeOme™ pwd or the placebo, were applied twice daily to the face (one side) and

to the inner side of the forearm. In addition, a washing stress was induced on the forearms by washing daily with a non-hydrating shower gel. The Caucasian female volunteers presented oily and uneven skin.

TEWL (on the inner side of the forearms), sebum levels and skin evenness on the face were determined at the beginning of the study and after 14 days.

After 14 days of treatment with 1% Black BeeOme™ pwd, an improvement of TEWL compared to the placebo was observed on the inner forearms, despite the daily washing stress. In comparison to initial conditions, the improvement