Cannabidiol in skin care textiles

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Abstract

Investigations on therapeutic routes of the cannabinoid system revealed its performance against muscle pain and inflammatory diseases as well as to preserve skin homeostasis. Potential uses of non-psychoactive cannabidiol (CBD) concern acne, psoriasis, eczema, etc. CBD is a skin permeable cannabinoid (1). Apart from topical applications of skin caring oils and lotions functional textiles exhibit a capable transfer of CBD to the skin.
To combine skin care with textile world cellulosic fibers derived from Lyocell, Viscose or Modal offer beneficial reservoirs for special agents and their release. Whereas different materials like inorganic particles, organic resins, secondary polysaccharides, etc. were proven to be distributed inside the cellulose skeleton, direct incorporation of liquid lipophilic additives into cellulosic fibers exhibits an exceptional challenge. Thermodynamic incompatibility of hydrophilic cellulose and lipophilic oils or waxes has to be overcome by composites, which allows permanent incorporation.

The presented technology gives rise to bind active agents like CBD not only on the fiber surface but incorporated over the whole fiber cross-section (2). In this way, a depot inside the fiber can be built up that simultaneously release CBD over a long period (3). The depot gives sufficient robustness against further processing inside the textile chain to yarns and finished textiles. Seamless knitting ensures the production of tight-fitting garments, which favor the CBD transfer to the skin.

The presentation comprises cannabinoids analysis at all processing stages. Analytical validation of extraction and measurement in fibers and textiles is presented. Proof of transfer from textile to an artificial skin is demonstrated. Long-lasting behavior is compared to state-of-the-art technologies.

(1) Kirk A.D., Akanji T., Li H., Shen J., Allababidi S., Seeram N. P., Bertin M. J., Ma H. *Med Cannabis Cannabinoids* 2022,5,129–137.

(2) Bauer R.-U., Meister F., Mooz M., Krieg M., Riede S., German Patent DE102015121440, 2016
(3) Wendler F., Meister F, Redlingshöfer B. Patent pending, 2025.

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