



EXTENDED ABSTRACTS

The effects of Raspberry stem cells as an antioxidant in UVB-induced damaged

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ABSTRACT

Ultraviolet radiation represents one of the important contributing factors to cellular damages in human skin. UV exposure especially in the UVB (280–320 nm) range is the main cause of important problems because the UV radiation can penetrate the skin layers and reach the dermis. Due to the penetration damaging keratinocytes and fibroblasts observed. The application of antioxidant substances as an active ingredient in cosmetic formulations. The most important ability of this active substances as protector of the skin against oxidative damage by UVA and UVB radiation. Cosmeceuticals have been developed with claims of anti-wrinkle and firming, moisturizing and lifting, and skin toning and whitening activity. The aging of the skin manifests itself in many ways: drying out, loss of elasticity and texture, thinning, damaged barrier function, the appearance of spots, modification of surface line isotropy, and, finally, wrinkles. Antioxidant products are the main cosmeceuticals in the market currently being made using active ingredients. Over the last decade, the advantages of plant stem cells and tissue culture technologies have been widely explored in the development of highly efficient platforms for more rapid production of pharmaceutically important molecules of plant origin or heterologous expression of therapeutic proteins. Considering the legal or ethical situations, botanical stem cells are used in cosmetic products in order to avoid the sourcing and extracting animal- or human-derived stem cells. Nowadays, there are many cosmetic products, including both cosmeceuticals and nutricosmetics, which have active ingredients, derived by plant cells culture technology which are used in topical products as active material. In cosmetic products, both plant cells and plant extracts are used as active ingredients. The extracted compounds from stem cells are safe and clean, because the cells are grown under sterile and controlled conditions, thus there is no risk of pathogens or environmental contamination; furthermore, there is the high sustainability: no agricultural land is

exploited, less water consumption and less waste material. *Rubus idaeus*, commonly called raspberry or red raspberry, is a thorny deciduous shrub which produces delicious red berries. The leaves are therapeutically used as an herbal medicine internally for gastrointestinal and respiratory problems, and topically for skin rashes. It furnished instantaneous and long-term soothing effect especially against UV-induced irritations. It decreases in-cell ROS production, repairs & protects DNA, and increases SIRT-1 & -6 expression. Furthermore, it counteracts oxidative harm, enhances cellular permanency, and provides reinforcement action. In this study, scientists compare the effects of plant cells of raspberry and plant stem cell extracts of raspberry as an antioxidant ingredient with measurement of important factors.

Fifteen masculine mice weighing 200-250 g are collected in a standard condition, after 48 hours divided them randomly into the three groups. Exposed to 100 mJ/cm² UVB radiation on their back zone. Control group, a group that treated with formulation consists of raspberry plant cells and the group that treated with formulation consists of raspberry stem cells extracts. Every 24 hours the raspberry extract formulation used on UVB-induced damaged zone. Every 24 hours ROS and TEWL measured. All experiments performed in accordance with the NIH Guide for Care and Use of Laboratory Animals. Results: with due attention to the results of histologic experiments and measuring of ROS and TEWL, in day 5 demonstrated that the effects of the group that treated with formulation consist of raspberry stem cells extract are much better. In the clinical study shown the improvement of important role of mice in group outward appearance in group 3. Conclusion: Due to the result of the formulation included raspberry stem cells extract has better quality and promptitude in repairment of UVB-induced damage.

Keywords: Antioxidant, Stem cell, Plant stem cells extract, UVB, Raspberry

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