

Exploiting the Potential of Dehydroabietic Acid Formulations to Tackle Skin Ageing

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Abstract:

Skin is the largest organ of the body, covering an area of 1.5–2m² and is affected by several external environmental factors such as ultraviolet radiation, air pollution, smoking. Its main functions are temperature regulation, immunity from microorganisms, maintaining electrolyte balance, and protection from

physical injuries, chemical agents and ultraviolet (UV) radiation. Skin ageing is one of the most important phenotypes of this process and occurs in every layer of the skin, primarily due to the degradation of its components. Skin care and “anti-ageing” have become one of the hot spots of modern developed societies specially in the last decades, in an increasingly hedonist world. Currently, the skin care market based on natural products is growing particularly strong. Research of naturally occurring agents with regenerative/preventive properties is greatly expanding and in recent years numerous plant-derived products have been investigated with that purpose. In addition, there is a trend for a more sustainable, eco-friendly world, justifying multiple efforts for searching added value from industrial processing products.

Dehydroabietic acid (DAA) is a natural diterpene and major component of the rosin fraction of oleoresin produced by conifer species, such as grand fir (*Abies grandis*) and lodgepole pine (*Pinus contorta*). It is a substance present in significant quantities in the paper mill effluents. However, previous studies have demonstrated that DAA has “antiaging” effects in human dermal fibroblasts.

Skin ageing is closely related to radiation exposure, specially for Caucasoids, involving vascular and skin microcirculation alterations. However, knowledge about the potential benefits of DAA formulations in human skin is still insufficient or inexistent. Thus, the main purpose of this work is to develop nanotechnology-based formulations containing DAA a subproduct in the cellulose industry – highly relevant for our economy, and to evaluate their effects on human skin basic physiology (water dynamics, biomechanics, microcirculation), once established its safety profile. This research should correspond to the first development step to screen the potential interest of this ingredient and its value for a sustainable environment.