ANTI-AGING EFFECTS OF DIMOCARPUS LONGAN FRUIT CONCENTRATE ON SKIN

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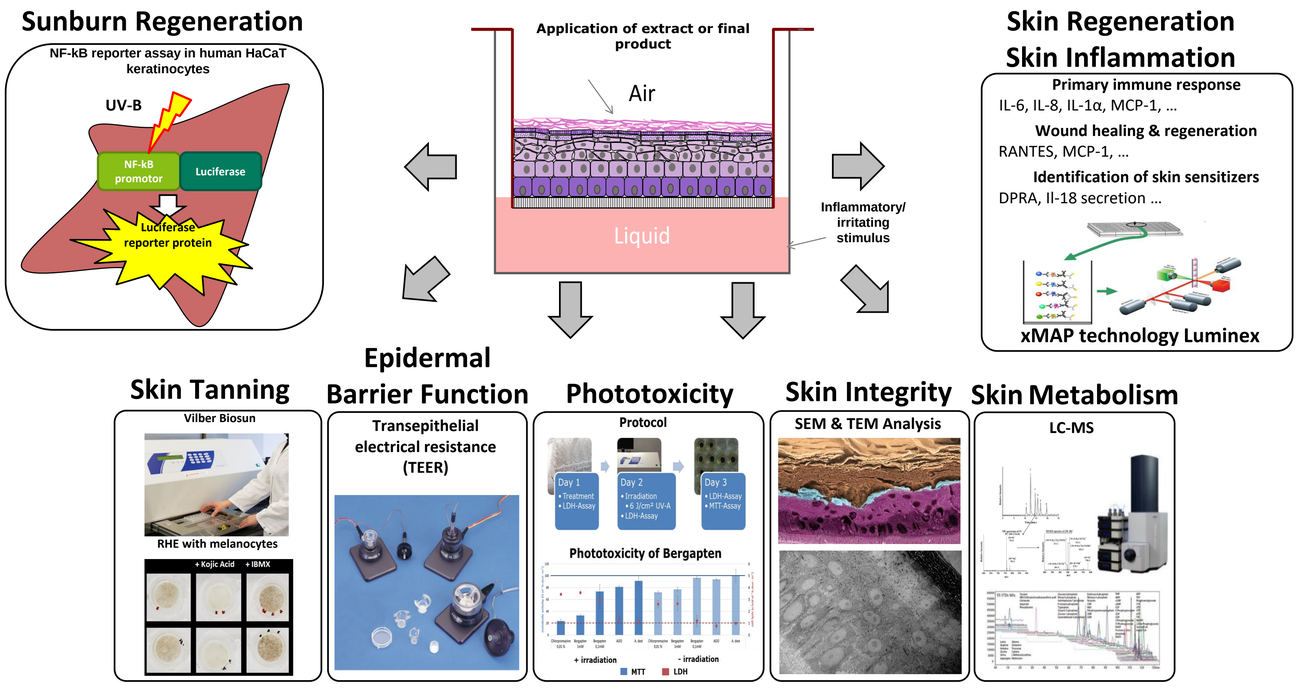
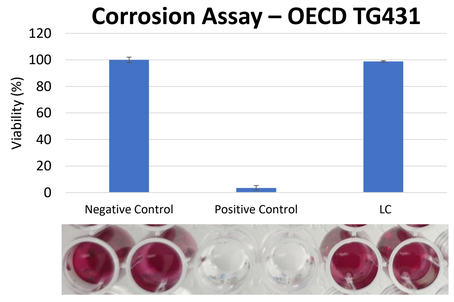
Dimocarpus Longan is a popular plant with highly nutritious fruits that has been used for thousands of years for consumption and in traditional Chinese medicine as a remedy for many diseases. However, the potential of important bioactive constituents has not been fully explored. The aim of this study was to evaluate the concentrate of the whole fruit for its potential anti-aging effects on human skin. Longan fruit concentrates were obtained by milling, pressing and heating/cooling cycles, followed by vacuum-distillation at elevated temperature.

Qualitative and quantitative phytochemical analyses were performed by high-performance liquid chromatography coupled with high-resolution mass spectrometry (UHPLC-hr-qTOF/MS). In addition, *in vitro* antioxidant assays, anti-enzyme assays, 2-dimensional HaCaT (aneuploid immortal keratinocyte cell) *in vitro* assays and tests in 3-dimensional reconstructed human epidermis (RHE) were performed. The comprehensive studies demonstrated a high antioxidant potential, a significant reduction in collagenase activity and dose-dependent skin whitening effects. Skin-soothing effects were demonstrated on both, 2D-HaCaT and 3D-RHE models. The *in vitro* skin irritation and corrosion assays performed according to OECD guidelines and the patch test performed according to ICDRG guidelines also confirmed skin tolerance.

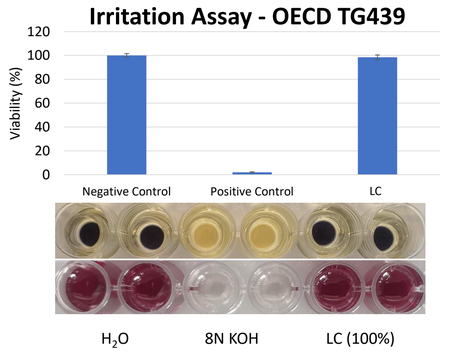


Safety Assessment

Corrosion Assay – OECD TG431



Irritation Assay - OECD TG439



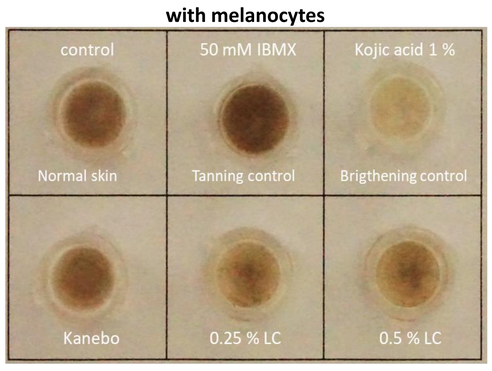
Patch Test – ICDRG Guidelines

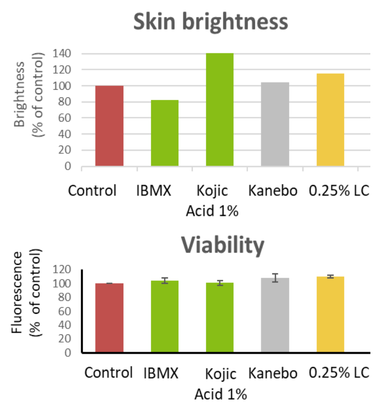
Skin corrosion and irritation tests enable the evaluation of potential harmful effects of products on the skin and are used for safety assessment according to OECD TG 439, OECD TG 439 and ICDRG guidelines, respectively.

Activity Assessment

Skin Brightening Assay

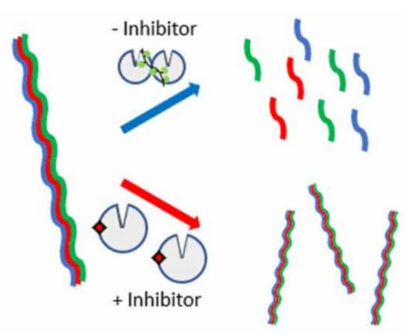
3D reconstructed human epidermis with melanocytes

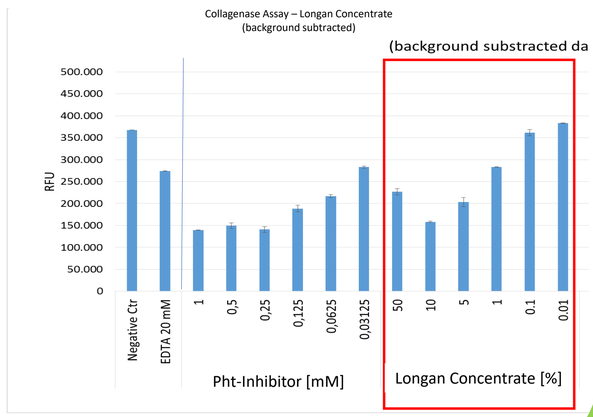




The skin brightening assay is a test for the whitening effect of products on skin by lowering the production of melanin, interfering with melanosomes or influencing melanogenesis.

Collagenase Inhibition

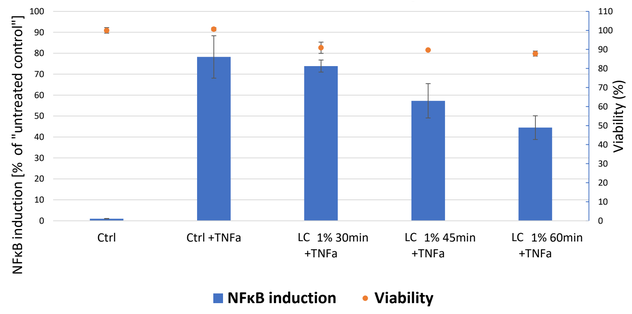




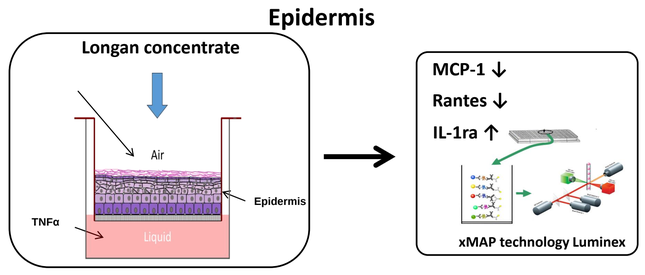
The collagenase inhibition assay shows possible reduced collagen degradation and thus serves to demonstrate anti-aging activities as high collagenase can lead to alteration in the collagen and elastin composition leading to wrinkles and sagging of tissue.

Skin Calming Potential

HaCaT Luciferase assay



3D Reconstructed Human Epidermis



TNF ∝ … activation
WFA … positive reference
MCP-1 (Cytokine) …. should go down ⬇ - skin calming effect
Rantes (Chemokine) … should go down ⬇ - skin calming effect
IL-1ra (Interleucin 1 receptor antagonist) … should go up ⬆ – skin calming effect

Anti-inflammatory effects of products can be evaluated by means of a skin calming assay. Furthermore, evaluation of changes in chemokine and cytokine expression allows a statement about immunomodulatory effects.

Summary: The analyses performed clearly show the highly potent anti-aging properties of the longan fruit concentrate. In combination with the safety assessment shown, these positive effects offer high potential in cosmetic formulations.

References

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