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Wound-healing properties of nut oil from Pouteria lucuma.

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Author information

Abstract

BACKGROUND: Cell migration, angiogenesis, inflammation, and extracellular matrix remodeling are key events in wound healing. Natural products, including fatty acids (FAs), can accelerate wound healing by modulating the aforementioned events.

AIMS: This study aims to evaluate the effect of lucuma (*Pouteria lucuma* O Kezte) nut oil (LNO) on fibroblasts migration, angiogenesis, inflammation, bacterial and fungal growth, and wound healing. Methods GC-MS analysis of FAs methyl esters (FAMES) was used for chemical characterization of LNO. In vitro studies were carried out with LNO investigating the induction of cell migration, cytoskeleton remodeling of human fibroblasts, inhibition of LPS-induced nitric oxide production in macrophages, and antibacterial and antifungal effects. Two in vivo studies were carried out to study LNO's effect on angiogenesis and wound healing: (i) tail fin regeneration in transgenic zebrafish larvae expressing enhanced green fluorescent protein (EGFP) in vascular endothelial cells was used to study vessel sprouting and wound healing and (ii) the closure of wounds was evaluated in CD-1 mice after topical applications of LNO-containing formulations.

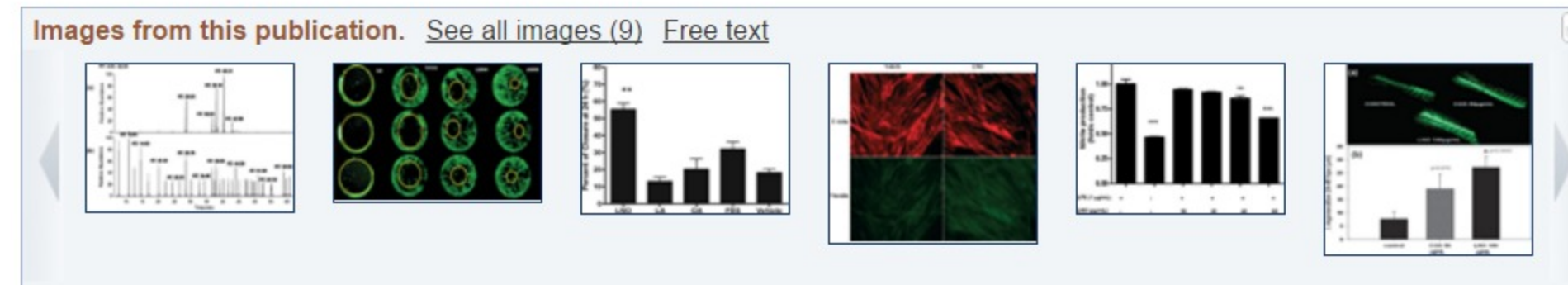
RESULTS: Lucuma nut oil is a mixture of FAs, 99.7% of which were characterized. Major components of LNO (w/w) are linoleic acid (38.9%), oleic acid (27.9%), palmitic acid (18.6%), stearic acid (8.9%), and γ linolenic acid (2.9%). In vitro studies showed that LNO significantly promoted migration and vinculin expression in human fibroblasts. LNO decreased LPS-induced nitric oxide production and did not display significant antibacterial or antifungal effects. LNO induced tail fin regeneration in transgenic zebrafish larvae 48 h after tail fin amputation and significantly accelerated cutaneous wound closure in CD-1 mice.

CONCLUSIONS: Natural FAs from *P. lucuma* nut promote skin regeneration and, thus, may have applications in medicine and skin care.

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