



The effect of terpene concentrations on the skin penetration of diclofenac sodium

A. Nokhodchi^a  , K. Sharabiani^b, M.R. Rashidi^b, T. Ghafourian^{a, b}

Show more 

 Outline |  Share  Cite

<https://doi.org/10.1016/j.ijpharm.2006.10.041>

[Get rights and content](#)

Abstract

Terpenes and sesquiterpenes have been suggested as promising non-toxic, non-irritating transdermal penetration enhancers. This investigation aimed to study the effect of terpene concentration on the transdermal absorption of diclofenac sodium from ethanol:glycerin:phosphate buffer solution (60:10:30). Therefore, enhancing effects of various terpenes (menthone, limonenoxide, carvone, nerolidol and farnsol) with different concentrations (0.25, 0.5, 1, 1.5 and 2.5%, v/v) on the permeation of diclofenac sodium were evaluated using Franz diffusion cells fitted with rat skin. Furthermore, solubility of diclofenac sodium in the vehicle in presence of different concentrations of terpenes was determined. The results showed that despite the negligible effect of terpenes on the drug solubility, there was a profound skin penetration enhancement effect, although the terpene enhancers varied in their ability to enhance the flux of diclofenac sodium. The results showed that at the highest concentration of terpene (2.5%, v/v) the rank order of enhancement effect for diclofenac sodium was nerolidol > farnesol > carvone > methone > limonenoxide, whereas at the low concentration of 0.25% the rank order was farnesol > carvone > nerolidol > menthone > limonenoxide. No direct relationship existed between terpene concentration and the permeation rate. The most outstanding penetration enhancer was nerolidol, providing an almost 198-fold increase in permeability coefficient of diclofenac sodium, followed by farnesol with a 78-fold increase.

Keywords

Terpenes; Diclofenac sodium; Skin permeation; Enhancer; log *P*

Recommended articles

Cited by (89)

Evidence-Based Nutrition and Clinical Evidence of Bioactive Foods in Human Health and Disease

2021, Evidence-Based Nutrition and Clinical Evidence of Bioactive Foods in Human Health and Disease

Transdermal Drug Delivery: Concepts and Application

2020, Transdermal Drug Delivery: Concepts and Application

Toxicological and pharmacologic effects of farnesol (C₁₅H₂₆O): A descriptive systematic review

2019, Food and Chemical Toxicology

Show abstract 

In vitro antileishmanial and cytotoxic activities of nerolidol are associated with changes in plasma membrane dynamics

2019, Biochimica et Biophysica Acta - Biomembranes

Show abstract 

Nanodrug delivery systems for transdermal drug delivery

2019, Nanomaterials for Drug Delivery and Therapy

Show abstract 

α -Bisabolol improves 5-aminolevulinic acid retention in buccal tissues: Potential application in the photodynamic therapy of oral cancer

2017, Journal of Photochemistry and Photobiology B: Biology

Citation Excerpt :

...To improve the effectiveness of 5-ALA in the PDT for the treatment of localized tumors such as oral cancers, it is essential to increase its retention in buccal tissue and reduce its transmucosal permeation. Hydrophilic terpenes effectively enhance the permeation of hydrophilic drugs by increasing their solubility in the vehicle and thereby promoting drug permeation in different tissues [27,38–39]. The lipophilic terpene α -Bis has improved the permeability of hydrophilic drugs in skin models, even when used at concentrations as low as 5% (w/w) [25]...

[Show abstract](#) ✓

 [View all citing articles on Scopus](#)

[View full text](#)

Copyright © 2006 Elsevier B.V. All rights reserved.



Copyright © 2022 Elsevier B.V. or its licensors or contributors.
ScienceDirect® is a registered trademark of Elsevier B.V.

 RELX™