J Ethnopharmacol. 2016 Feb 17:179:22-6. doi: 10.1016/j.jep.2015.12.039. Epub 2015 Dec 22.

α-Pinene, linalool, and 1-octanol contribute to the topical anti-inflammatory and analgesic activities of frankincense by inhibiting COX-2

Xiao-Jun Li [1], Yan-Jing Yang [1], Yu-Sang Li [1], Wei Kevin Zhang [1], He-Bin Tang [2]

Affiliations

PMID: 26721216 DOI: 10.1016/j.jep.2015.12.039

Abstract

Ethnopharmacological relevance: Frankincense oil and water extracts (FOE, FWE) have long been used for external treatment of inflammation and pain. The present study was conducted to identify the active ingredients responsible for the anti-inflammatory and analgesic effects and to determine the underlying mechanisms.

Materials and methods: The compositions of FOE and FWE were identified and compared by GC-MS. The anti-inflammatory and analgesic activities of the two extracts and their possible active ingredients (α-pinene, linalool, and 1-octanol) were evaluated and compared in a xylene-induced ear edema model and a formalin-inflamed hind paw model. Inflammatory infiltrates and cyclooxygenase-2 (COX-2) expression in hind paw skin were investigated by histological staining.

Results: The contents of α-pinene, linalool, and 1-octanol in FOE were much higher than those in FWE. Mice treated with FOE exhibited greater and faster lessening of swelling and pain than mice treated with FWE. The combination of the three components had more potent pharmacological effects on hind paw inflammation and COX-2 overexpression than the three components used alone.

Conclusions: These findings suggest that topical application of FOE or its active ingredients (including α-pinene, linalool, and 1-octanol) exhibit significantly anti-inflammatory and analgesic effects through inhibiting nociceptive stimulus-induced inflammatory infiltrates and COX-2 overexpression.

Keywords: Analgesic; Anti-inflammatory; Cyclooxygenase-2; Frankincense; Oil extract.

Related information

MedGen
PubChem Compound (MeSH Keyword)

LinkOut - more resources

Full Text Sources
Elsevier Science

Other Literature Sources

The Lens - Patent Citations
scite Smart Citations

Research Materials
NCI CPTC Antibody Characterization Program

Miscellaneous
NCI CPTAC Assay Portal