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ANALYSIS OF TURMERIC (CURCUMA LONGA LINN) ESSENTIAL OIL FROM DIFFERENT GROWING LOCATIONS USING FTIR/GC-MS SPECTROSCOPY COUPLED TO CHEMOMETRICS AND ITS WOUND HEALING ACTIVITIES (2024) *International Journal of Applied Pharmaceutics*, 16 (Special Issue 1), pp. 152-159. Cited 1 time.

DOI: 10.22159/ijap.2024.v16s1.33

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Abstract

Objective: This study aims to determine the wound-healing activity of turmeric essential oil (TEO) collected from seven growing locations in West Sumatra, classify it based on fingerprint patterns of IR spectra combined with chemometrics, and identify their metabolite profiling using GC-MS spectroscopy. Methods: Fresh turmeric rhizome was extracted by the hydrodistillation method. TEO classification was carried out by PCA (Principal Component Analysis), and PLS-DA (Partial Least Squares-Discriminant Analysis) was used for predicting characteristic functional groups and metabolites (VIP>1) in TEO. Wound healing activity was performed using in vitro fibroblast cell proliferation and migration assay. Data analysis was performed using one-way ANOVA with a 95% confidence level. Results: PCA analysis based FTIR spectra was able to determine highland and lowland-originated TEO. The metabolites responsible for TEO classification were α -Phellandrene and D-limonene. The result showed that TEO originating from both lowlands and highlands enhanced fibroblast cell proliferation and fibroblast cell migration. Conclusion: The combination of IR spectral fingerprint patterns and chemometric analysis could classify TEO based on the height location of growth. The results showed that the altitude of the growing location had no significant effect on the wound-healing activity of TEO from West Sumatra ($p>0.05$). © 2024 The Authors.

Author Keywords

Chemometrics; Essential oil; FTIR; GC-MS; Turmeric; Wound healing

Index Keywords

alpha phellandrene, beta farnesene, caryophyllene, cineole, curcumin, dimethyl sulfoxide, essential oil, limonene, terpinolene, turmeric; Article, cell migration assay, cell proliferation, chemometric analysis, chemometrics, Curcuma longa, fibroblast, Fourier transform infrared spectroscopy, hydrodistillation, in vitro study, infrared spectroscopy, mass fragmentography, metabolic fingerprinting, nonhuman, partial least squares regression, physical chemistry, principal component analysis, refraction index, rhizome, wound healing, wound healing assay

Chemicals/CAS

alpha phellandrene, 99-83-2; beta farnesene, 18794-84-8; caryophyllene, 87-44-5; cineole, 470-82-6, 55962-72-6; curcumin, 458-37-7; dimethyl sulfoxide, 67-68-5; limonene, 138-86-3, 5989-27-5; terpinolene, 586-62-9; turmeric, 8024-37-1

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Publisher: Innovare Academics Sciences Pvt. Ltd

ISSN: 09757058

Language of Original Document: English

Abbreviated Source Title: Int. J. Appl. Pharm.

2-s2.0-85191002281

Document Type: Article

Publication Stage: Final

Source: Scopus

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