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Understanding the effects of different parameters of soxhlet extraction on bioactive compounds from aquilaria malaccensis leaf through GCMS-based profiling (Article) (Open Access)

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Abstract

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Bioactive compounds from plants have been shown to possess therapeutic values which are being used as medicine as well as ingredients for functional foods and nutraceuticals. While qualitative and quantitative studies on the bioactive compounds of plant extract are important to establish their claimed therapeutic properties; less is focused on effects and interrelationship of process (extraction) conditions used to obtain the desired bioactive compounds. As such, this study intended to determine the effects of different parameters on the extraction of Aquilaria malaccensis leaf extract (ALEX) bioactive compounds. Metabolite profiling of bioactive compounds of ALEX samples was conducted using gas chromatography-mass spectrometry (GCMS) with subsequent multivariate statistical analysis through principal component analysis (PCA) with the aid of MATLAB software. The GCMS analysis detected diverse potential bioactive compounds in ALEX samples with hydrocarbon, terpenes and esters being the primary groups. n-hexadecanoic acid and hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester were found to be present in most of the ALEX samples. PCA showed that same Soxhlet extraction parameters were able to cluster the samples together and separate samples extracted with different extraction parameters based on the relative abundance of the particular compounds. In conclusion, it is notable that the samples were significantly separated based on Soxhlet extraction time as compared to the solid to solvent ratio and the suggested best Soxhlet extraction parameters were 18 hrs and 1:70 solid to solvent ratio. The findings from this study will facilitate the extraction and purification of the desired bioactive compounds from agarwood leaf that can be further used in development of functional foods and nutraceuticals. © 2019 The Authors.

SciVal Topic Prominence

Topic: 2-(2-Phenylethyl)Chromone | Aquilarium Sinensis | Thymeleacea

Prominence percentile: 87.406

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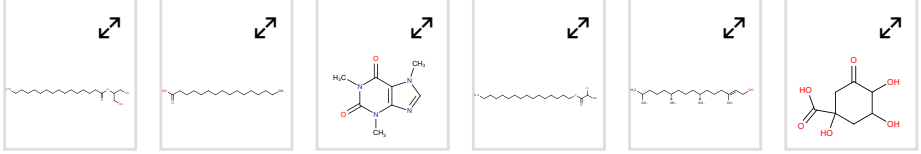

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Agarwood | Aquilaria malaccensis | Bioactive compounds | Gas chromatography-mass spectrometry | Principal component analysis

Indexed keywords

EMTREE drug terms: 1,19 eicosadiene | 1,4 eicosadiene | 16 hexadecanoyl hydrazide | 5 t butyl cycloheptene | bicyclo[3.1.1]heptane, 2,6,6 trimethyl | bicyclo[3.1.1]heptane, 2,6,6 trimethyl , (1 alpha 2beta 5alpha) | bioactive compound | butanoic acid, 3 methyl , 3,7 dimethyl 6 octenyl | ester | glycerol 1 palmitate | hydrocarbon | palmitic acid | phthalic acid bis(2 ethylhexyl) ester | phytol | plant extract | terpene | unclassified drug

EMTREE medical terms: Aquilaria | Aquilaria malaccensis | Article | biological activity | drug purification | ion chromatography | mass fragmentography | metabolic fingerprinting | metabolomics | particle size | phytochemistry | plant leaf | principal component analysis | retention time (chromatography) | Soxhlet extraction

Chemicals and CAS Registry Numbers:

palmitic acid, 57-10-3; phthalic acid bis(2 ethylhexyl) ester, 117-81-7; phytol, 150-86-7

Device tradename:

Agilent 7890A, Agilent

Manufacturers:

Drug manufacturer:

Merck, Germany;

Sigma Aldrich, United States

Device manufacturer:

Agilent

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International Islamic University Malaysia		IIUM

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