Purification and Screening of Selected Microbes for Biotransformation of Xanthorrizol from the Essential Oil of *Curcuma xanthorrhiza*

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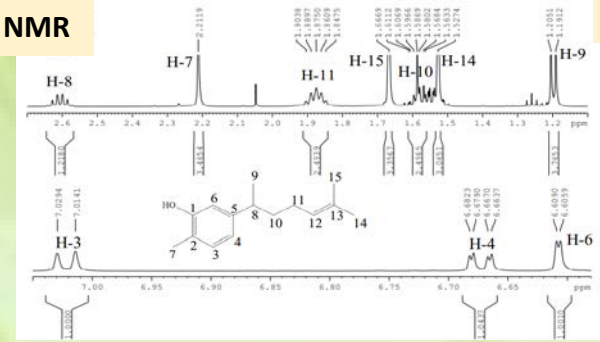
ABSTRACT

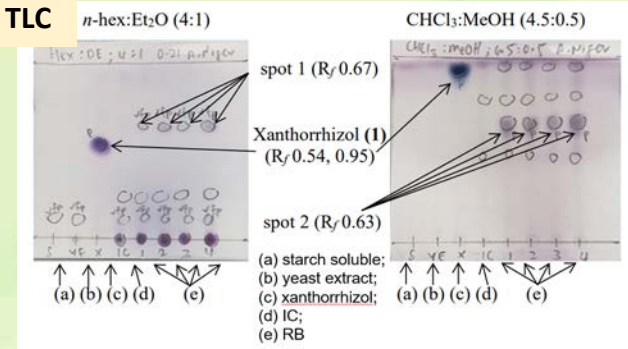
Xanthorrhizol, a bisabolene-type sesquiterpenoid is the most active and abundant component present in the essential oil of *Curcuma xanthorrhiza* (temulawak). It was reported to possess various pharmacological activities that includes antimicrobial, anti-inflammatory, antioxidant, antihyperglycemic, antihypertensive, antiplatelet, nephroprotective and hepatoprotective, estrogenic and antiestrogenic properties. To further evaluate its pharmacological potency based on the structure-activity relationship, abundance amount of xanthorrhizol need to be purified and subject to chemical synthesis to yield the xanthorrhizol analogues. Common approaches to synthesize the analogues is through the chemical reactions. Biotransformation utilizing microbes as biocatalysts served as one of the green alternatives replacing chemical synthesis method which able to yield potential xanthorrhizol analogues. In this study, xanthorrhizol will be purified from the crude essential oil utilizing chromatographic and two steps chemical synthesis techniques. The structure and purity of xanthorrhizol were determined through spectroscopic analysis. Selected microbes i.e *Streptomyces sp.* and *Aspergillus sp.* will be screened as potential biocatalysts for the biotransformation reaction. Thin layer chromatography (TLC) and Gas Chromatography-Mass Spectrometry (GC-MS) were used to monitor the presence of biotransformation product.

RESULTS & DISCUSSION

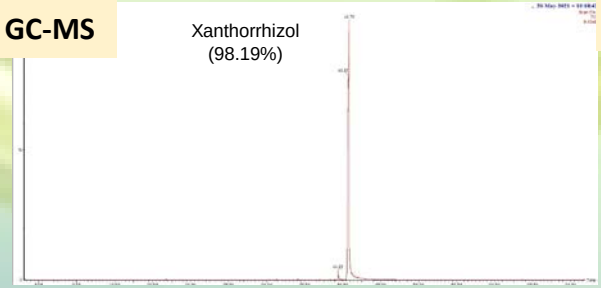
NMR



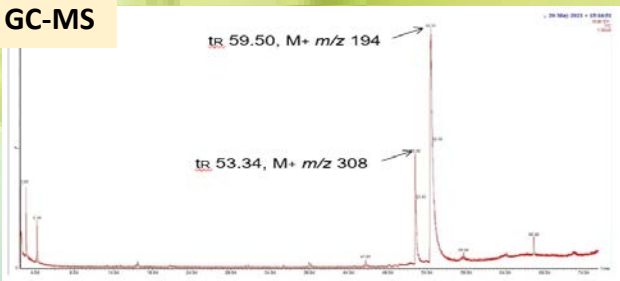
TLC



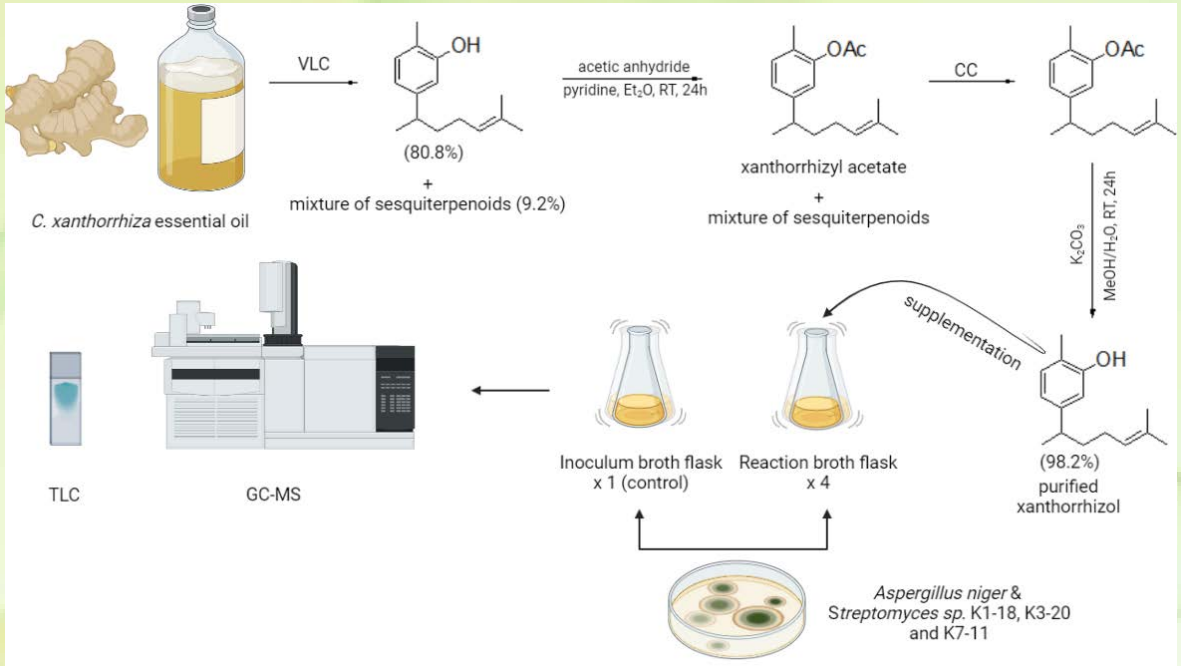
GC-MS



GC-MS



METHODOLOGY



CONCLUSION

- Xanthorrhizol was successfully isolated in a pure form (98% purity) through combination of chromatographic techniques (VLC and CC) followed by two steps synthesis method (acetylation and hydrolysis).
- Only A. niger able to catalyze the biotransformation of xanthorrhizol.
- Qualitative and quantitative analysis through TLC and GC-MS, respectively showed the presence of two biotransformation products.

ACKNOWLEDGEMENT

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