

UNIVERSITI TEKNOLOGI MARA

**INFLUENCE OF SOAKING FOR EXTRACTION
OF ESSENTIAL OIL FROM AGARWOOD
(*AQUILARIA MALACCENSIS*)**

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution for any degree or qualification.

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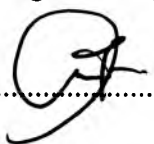
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ABSTRACT

Nowadays, high demands in agarwood oil makes Malaysian are actively involved in agarwood plantation and production of agarwood oil. Most of previous publications focused only on the extraction of chemical compounds from agarwood but there is still lacking in the pre-treatment part. Pre-treatment like soaking could break the parenchyma cells, hence facilitate the oil glands to rupture. Therefore, the main goal of this research is to investigate the effect of soaking to the agarwood structure, volatilization temperature of essential oil and chemical components extracted using various techniques and solvents. Furthermore, the effect of temperature and extraction time on agarwood oil yield produced from pressurized steam distillation also studied using RSM. The investigations on agarwood chips and oil were carried out using TGA, SEM and GC-MS. In this research agarwood was soaked in three different solvent such as sulphuric acid, lactic acid and water. Works done in this research identified, agarwood soaked in lactic acid showed the volatilization temperature of agarwood oil at temperature ranges of 110 to 200 °C and produces the biggest rupture. This sample also revealed the highest numbers of compounds in the immersion solvent. Furthermore, this research proved that different agarwood oil components were obtained via different extraction and pre-treatment techniques. Most components extracted using hexane is group terpene hydrocarbon, meanwhile oxygenated hydrocarbon components were observed in agarwood oils extracted via ethanol and methanol. In investigation of PSD, the highest yield was obtained by agarwood soaked in lactic acid at 103 °C for 11 hours, then followed by agarwood soaked in sulphuric acid and water at 118 °C for 4 hours and 110 °C for 11 hours respectively. Non-soaked agarwood recorded the lowest oil yield when the sample exposed to 107 °C for 12 hours of extraction process.

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