

Optimisation of Cell Wall Lipids Extraction from Oil Palm using Mixture of Chloroform and Methanol via Response Surface Methodology

ABSTRACT

Understanding oil palm's cell wall lipid during pathogenic invasion, especially from *Ganoderma* fungus helps us to devise better strategies in managing Basal Stem Rot caused by the fungus effectively. However, as the lipids of plant's cell wall is a delicate subject, while acquiring them in ample amount with decent quality for research purpose is an excruciating work, therefore it is crucial to develop an optimised method for acquisition. In this study, the effects of solvent ratio, extraction time, extraction temperature and biomass to solvent ratio pertaining effective lipids extraction from oil palm roots cell wall were investigated, aided with Central Composite design (CCD) of Response Surface Methodology (RSM) analysis to obtain optimum oil palm cell wall lipid extraction conditions. Using the projection of RSM model and validation of empirical evaluation, the results revealed that the optimum cell wall lipids yield was obtained under the following extraction conditions: 10 mL of solvent mixture (chloroform: methanol (2:1, v/v)) per gram tissue for 120 min with gentle agitation at 30°C of extraction temperature. Ultimately, Fourier Transform Spectroscopy (FTIR) analysis was carried out to validate the successful and complete extraction were achieved using the optimised condition.