

## **Improved cellulase production by *Botryosphaeria rhodina* from OPEFB at low level of moisture condition through statistical optimization.**

### **ABSTRACT**

The response surface method was applied in this study to improve cellulase production from oil palm empty fruit bunch (OPEFB) by *Botryosphaeria rhodina*. An experimental design based on a two-level factorial was employed to screen the significant environmental factors for cellulase production. The locally isolated fungus *Botryosphaeria rhodina* was cultivated on OPEFB under solid-state fermentation (SSF). From the analysis of variance (ANOVA), the initial moisture content, amount of substrate, and initial pH of nutrient supplied in the SSF system significantly influenced cellulase production. Then the optimization of the variables was done using the response surface method according to central composite design (CCD). *Botryosphaeria rhodina* exhibited its best performance with a high predicted value of FPase enzyme production (17.95U/g) when the initial moisture content was at 24.32%, initial pH of nutrient was 5.96, and 3.98g of substrate was present. The statistical optimization from actual experiment resulted in a significant increment of FPase production from 3.26 to 17.91U/g (5.49-fold). High cellulase production at low moisture content is a very rare condition for fungi cultured in solid-state fermentation.

**Keyword:** Cellulase; Optimization; Response surface methodology; Solid-state fermentation.