# Physicochemical property changes and enzymatic hydrolysis enhancement of oil palm empty fruit bunches treated with superheated steam


## ABSTRACT

The effect of superheated steam treatment on oil palm empty fruit bunches (OPEFB) was investigated in terms of physicochemical property changes and enzymatic hydrolysis enhancement. The experimental treatment was carried out at different temperatures (140-210°C) and durations (20-90 min). Results showed that as the superheated steam temperature and time increased, the size distribution also changed, resulting in more small particles. Analysis on the surface texture, color, and mechanical properties of the treated OPEFB also showed that significant changes resulted due to the superheated steam treatment. In support to this, Fourier Transform Infrared (FTIR) spectroscopy and thermogravimetric (TG) analyses showed that solubilization and removal of the hemicelluloses component also took place. As a result of this phenomenon, higher total sugar and glucose yield was achieved once the treated OPEFB was subjected to enzymatic hydrolysis. This suggests that superheated steam treatment could enhance OPEFB structure degradation for the preparation of a suitable substrate in order to produce a higher glucose yield in the enzymatic hydrolysis process.



**Keyword:** Superheated steam; Oil palm empty fruit bunch; Physicochemical properties