

Biological delignification of shredded oil palm empty fruit bunch using mycelia culture of *Ganoderma lucidum* as a potential ruminant feedstuff

ABSTRACT

Livestock production in Malaysia is still inadequate to meet the demand especially ruminant products. Efforts were made to increase the availability of local feed by having a better utilization of agro-industrial by-products which can increase the production of ruminant products. The extraction of palm oil produced abundant of empty fruit bunch (EFB), which considered as waste and has raised environmental concerns. It is a lignocellulosic raw material which consist high cellulose, hemicellulose and lignin. Researchers has reported that white-rot fungi have the ability for delignification by extracellular enzymes Thus, this study evaluated the cell wall constituents (cellulose, hemicellulose and lignin), the morphological surface changes, and in-vitro dry matter digestibility (IVDMD) of oil palm EFB fibres treated with mycelia culture of *Ganoderma lucidum*. Shredded EFB fibres were obtained and prepared as sterilized substrate in polypropylene bags, inoculated with mycelial culture of *G. lucidum* and incubated for 4, 8 and 12 weeks of incubation period. Result showed that there was significant reduction on EFB fibres fibre composition after treated with *G. lucidum* until reach the lowest at 12 weeks of incubation where 27.77% to 22.08% for cellulose, 19.30% to 14.15% for hemicellulose, while 12.69% to 7.49% for lignin content. The SEM images showed that silica bodies were removed from the strand surface and left only exposed pores at the bottom after treatment with *G. lucidum*. The IVDMD of treated EFB fibres were increased as incubation period increased where the highest at week 12 of incubation with 81.88%. These results suggested that the *G. lucidum* was effective in delignification of EFB fibres after 12 weeks of incubation and have the potential to be utilized as ruminant feedstuff. Utilization of biomass generated from palm oil mill not only will solve our environmental problem but also convert low quality biomass into valuable local feed for ruminants.