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## Lignocellulosic waste valorisation strategy through enzyme and biogas production

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### ABSTRACT

Lignocellulosic wastes are generally pre-treated to facilitate the hydrolysis stage during the anaerobic digestion process. A process consisting of solid substrate fermentation carried out by white rot fungi and anaerobic digestion was evaluated on corn stover to produce ligninolytic enzymes and biogas. The enzyme production was quantified every 3d for a month at 30 °C, and three fungal strains and two particle sizes of waste were compared. Of the main outcomes, *Pleurotus eryngii* produced the highest laccase enzyme activity compared with *Pleurotus ostreatus* and *Trametes versicolor*. Furthermore, this activity was improved by 16% when copper was used as an enzyme inducer. On the other hand, most of the conditions studied showed a decrease in maximum biogas production compared with untreated waste, the addition of copper decreased biogas production by 20%. Despite the above, *Pleurotus eryngii* showed promising results allowing a 19% increase of biogas production and high enzyme production values.

**Keywords:** anaerobic digestion, corn stover, laccase, particle size, white rot fungi.

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