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MYCELIAL GROWTH AND ENZYMATIC ACTIVITIES OF WHITE-ROT FUNGI ON ANAEROBIC DIGESTATES FROM INDUSTRIAL BIOGAS PLANTS

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Abstract

Solid digestate (SD) represents an environmental problem due to the continuous increase of biogas production. In the present study four white-rot fungal strains were screened for their ability to grow on two different SD samples, obtained from industrial biogas plants, using wheat straw (WS) as a control medium. Results show that i) the feedstock used in the biogas plant influences the time required for the colonization of the corresponding SD and ii) different fungal strains have different capabilities to colonize the same digestate. In particular, *Pleurotus ostreatus* SMR 684 reached the maximum proliferation on corn silage digestate (CSD) in the shortest time (12 days). Subsequently, *P. ostreatus* was grown on WS and CSD for 42 days with measurement of lignocellulolytic activities and lignocellulose components (lignin, cellulose and hemicellulose). Enzymatic activities reached a maximum around the 24th day of incubation. Ligninolytic activities showed similar trends on CSD and on WS, while some differences were observed in the levels of cellulolytic and hemicellulolytic activities. Lignin was reduced by 12% on CSD, this suggesting that the fungal treatment can increase polysaccharides accessibility in view of a further utilization of SD for biorefinery purposes.

Key words: biogas, biorefinery, solid digestate, white-rot fungi

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