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Lignocellulolytic activity of soil fungi isolated from different scenarios of conservation agriculture

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n the experiment there are four scenarios as Business-as-usual (T₁) (rice-wheat, rice-puddling, wheat-conventional till); Integrated crop and resource management (T₂) (rice-wheat-mungbean, rice-puddling, wheat-zero till, mungbean-zero till); Conservation Agriculture (CA)-based systems (T,) (rice-wheat-mungbean, rice- zero till, wheat-zero till, mungbean-zero till), Futuristic and diversified systems based on principles of CA (T₄) (Maize-wheat-mungbean, other practices are same as treatment three except rice is replaced by maize). In scenario T₁, T₂ and T₃ crop residue was left over in the field. We isolated fungi from soil of these scenarios and screen them for their lignocellulolytic activity. These could be used to finally enhance degradation of huge amount of cellulosic biomass deposited during every season, leading to improvement of soil health and reduction in environmental problems. The presence of endoglucanase (EC 3.2.1.4) was tested on the CMC agar media by staining with Gram's iodine. Degradation of cellulose was visualized as a clearing zone around the fungal colony. Cellulolytic fungal species were selected on the basis of the diameter of the hydrolysis zone surrounding the colonies. The diameter of the clearing zone around the colony shows degree of endoglucanase activity. The clear zone diameter/ colony diameter ratio was calculated and expressed as Index of Relative Enzyme Activity (I_{CMC}). Screening for presence of polyphenol oxidase (EC 1.10.3.1) was tested on tannic acid media. Formation of a dark brown pigment surrounding the point of inoculation was used as an indicator of polyphenol oxidase (PPO) activity on tannic acid media. Isolates which showing zones were further selected for lignocellulolytic enzyme production in rice-wheat straw powder amended broth. Some fungi give very good activity in liquid media.

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