

RESEARCH PAPER

Lignocellulolytic activities of crude gut extracts of marine woodborers *Dicyathifer mannii* and *Sphaeroma terebrans*

C.M. Bosire^{1*}, Laila Abubakar², James Ochanda¹, J.O. Bosire³

¹Centre for Biotechnology & Bioinformatics, University of Nairobi, P.O Box 30197-00100, Nairobi, Kenya

²Department of Biochemistry, University of Nairobi, P.O Box 30197-00100, Nairobi, Kenya

³Kenya Marine & Fisheries Research Institute, P.O Box 81651-80100 Mombasa, Kenya

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Abstract

Marine woodborers have a close association with tropical mangrove plants whereby they voraciously consume lignocellulose and play a role in nutrient cycling. They represent a rich source of potential lignocellulolytic enzymes that can be harnessed for conversion of biomass into simple sugars and other monomers for a variety of uses. Ligninolytic enzymes find applications in bio bleaching of pulp and decolouration of textile dyes, whereas cellulolytic and hemicellulolytic enzymes find applications in animal feed, manufacture of bread, bioethanol production and xylitol production among other uses. In this study, we obtained crude gut extracts from two marine woodborers, *Dicyathifer mannii* (Wright, 1866) and *Sphaeroma terebrans* (Bate, 1866), from three sampling sites along the Kenyan coast. Lignocellulolytic activities of the gut extracts were investigated in an effort to seek the species with the most lignocellulolytic efficacious extracts. Ligninolytic activities investigated were lignin peroxidase (LiP), manganese-dependent peroxidase (MnP) and laccase (Lac) or monophenol oxidase. Cellulolytic enzymes investigated were glucanases endoglucanase (endo-1-4- β -D-glucanase), exoglucanase (1,4- β -D-glucan-cellobiohydrolase), and β -D-glucosidase or cellobiase (β -D-glucoside glucanohydrolase). Endo-1-4- β -xylanase was investigated in the hydrolysis of xylan, the chief type of hemicellulose. *D. mannii* crude extracts showed an appreciable LiP activity of up to 34.65 \pm 0.116 U/L and endoglucanase (CMCase) activity of up to 50.7 U/ml (1 U represents the amount of enzyme which catalyzed the transformation of 1 micromol of substrate min⁻¹). *D. mannii* is implicated as a source of these enzymes for industrial use.