ABSTRACT

RUT NORMASARI. Characterization of endo-β-1,4-glucanase gene in termites Coptotermes curvignathus. Supervised by RIKA RAFFIUDIN and IMAN RUSMANA.

Termites are social insects that have a distinct task in form of caste within their colony. Workers play an important role in finding and degrading the cellulose food, due to the existence of endo-β-1,4-glucanase enzyme. Hence, this study was aimed to characterize Coptotermes curvignathus endoglucanase gene. Primers were designed based on the Coptotermes formosanus (CfEG) cDNA and Nasutitermes takasagoensis (NtEG) genomic DNA. These introns of C. curvignathus all showed GT/AG rule. Exon two up to five of C. curvignathus endoglucanase were aligned with exon three up to six from NtEG; while the intron two to four of C. curvignathus endoglucanase were at the same position with that of intron three up to five on NtEG. Exon two up to five of C. curvignathus endoglucanase resulted 564 bp and BLASTN analysis revealed that C. curvignathus endoglucanase homologous to CfEG. Putative amino acid obtained from C. curvignathus endoglucanase showed its high homology with CfEG. Analysis based on Pfam revealed that C. curvignathus endoglucanase was member of Glycosyl Hydrolase Family 9 (GHF 9) family and six-hairpin glycosidase superfamily. Motifs found in endoglucanase C. curvignathus were one consensus signature of GHF 9, nucleophile, co-nucleophile, salt bridge, and N-terminal. Based on DNA and amino acid homology between CfEG and endoglukanase C. curvignathus it was expected that endoglukanase C. curvignathus has similar high cellulase activity as shown in CfEG. This will be an essential database for finding an effective cellulase enzyme for further applications.

Keywords: C. curvignathus, endoglucanase, GHF 9