Lignocellulose, the main constituent of plant biomass, is currently targeted as a primary feedstock for the production of biofuels. However, the extant processes used for fuel conversion are a significant limiting factor for bioethanol industry. A pursuit of novel enzymes is an option to overcome a lack of efficiency of chemical hydrolysysis reaction. Termites, which are phylogenetically related to cockroaches, are important decomposers of lignocellulosic plant material. The capacity of termites and cockroaches to digest cellulose results from the association of endogenous and exogenous enzymes. Nevertheless, the study of cockroaches as potential sources of enzymes or microorganisms for lignocellulose depolymerization is mostly overlooked. This study shows cellulolytic activity in different tissues and gut contents of cockroaches under different diets. Adults cockroaches were individualized and received different diets. After a period of ten days they were dissected and their guts were segmented and used for cellulolytic or hemicellulolytic activity assays. Laminarinase activity found in the midgut content of cockroaches fed cane bagasse is on average 80% higher than animals fed Avicel®. Xylanolytic activity found in the midgut content of cockroaches fed xylan is on average 50% higher than animals fed cane bagasse and 75% higher than cockroaches fed Avicel®. Cellobiase activity found in the midgut tissue of cockroaches fed cotton is on average 35% higher than animals fed Avicel® and 74% higher than insects fed cane bagasse. Diets rich in cellulose and hemicellulose compounds seem to influenced the production of enzymes and probably causing changes in microbiota, especially in the midgut.

Word Keys: bioethanol, cellulase, cockroach, hemicellulase, sugar cane bagasse.

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