Digestive Enzymes from Gut of *Nasutitermes corniger* Workers: Detection, Characterization and Modulation by Termicidal Lectins

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*Nasutitermes corniger* is a termite pest that causes damage to several buildings. Lectins from *Myracrodruon urundeuva* bark (MuBL), heartwood (MuHL) and leaf (MuLL) were able to kill these termites. Digestive enzymes have several biotechnological applications and can be targets for insect control. This work evaluated the presence of cellulases (endoglucanase, exoglucanase and β-glucosidase), hemicellulases (β-xylosidase, α-L-arabinofuranosidase and β-xylanase), α-amylase and proteases in gut extracts from *N. corniger* workers. Enzyme activities were also evaluated after incubation of gut extracts at different temperatures (30–100°C) as well as with protease inhibitors (pepstatin A, E-64, EDTA and PMSF, 8 mM) and termicidal lectins from *M. urundeuva*. The high values detected for endoglucanase (4.6±0.3 U/mg) and β-xylanase (0.96±0.17 U/mg) activities evidenced the adaptability of *N. corniger* workers to digest lignocellulosic materials. Activities of exoglucanase (140±10 mU/mg), β-glucosidase (10±0.0 mU/mg), β-xylosidase (5.8±1.0 mU/mg), α-L-arabinofuranosidase (0.72±0.2 mU/mg), α-amylase (24.7±2.5 U/mg) and protease (215±12.2 U/mg) were also detected. Exoglucanase, β-xylanase, α-L-arabinofuranosidase and protease activities were resistant to heating at 100, 100, 90 and 90 °C, respectively. The other enzyme activities were abolished after heating between 40 and 70 °C. Effect of protease inhibitors revealed that serine proteases were the main proteases at worker gut extract. Enzyme activities were stimulated, inhibited or not affected by *M. urundeuva* lectins. Also, MuBL, MuHL and MuLL differed among them regarding effects on enzyme activities. In conclusion, *N. corniger* worker gut possesses an enzymatic apparatus with biotechnological potential and termicidal activity of *M. urundeuva* lectins may be linked to modulation of digestive enzymes.

Keywords: *Nasutitermes corniger*, cellulase, hemicellulase, amylase, protease, lectins, *Myracrodruon urundeuva*.

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