

## Isolation and characterization of endoglucanases produced by microbes residing in the gut of *Coptotermes curvignathus* termite

### ABSTRACT

Bacteria and enzymes in the gut of termites play an important role to digest lignocellulosic material. *Coptotermes curvignathus* is one of the very few destructive species that can infest living plants. In this study, five bacteria isolated from *C. curvignathus* gut; four aerobic *Bacillus* spp. and an anaerobic uncultured bacterium were identified to produce endoglucanase with molecular size of 11 kDa which is significantly smaller than the endoglucanase produced by *Reticulitermes speratus*. Biolog reader identification showed that TG117 and N45/1 were *Bacillus cereus/thuringiensis*, TG111 was *Bacillus pseudomycooides* and TG005 was *Bacillus mycooides*. Endoglucanase produced by aerobic isolate NA45/1 showed promising potential as an industrial enzyme with significantly higher enzymic activity than the commercial cellulase from *Aspergillus Niger* (C1184 Sigma). Endoglucanase NA45/1 displayed enzymatic activity 0.3961 U at pH 9 and 45°C. The endoglucanase TG111 acted optimally at alkaline condition with 0.2294 U whereas endoglucanase TG117 functioned best at slightly acidic condition. This study showed that the termite gut has a wide range of endoglucanase enzymes with various optimum temperatures and pH.

**Keyword:** Endoglucanases; Microbes; *Coptotermes curvignathus*