

Evaluation of antibacterial susceptibility pattern of cellulolytic bacteria isolated from *Coptotermes curvignathus* gut to heavy metals, disinfectants and common antibiotics for termite control

Essam A. Makky^{ab}; Chan Cai Wen^a; Muna Jalal Ali^c

^a Faculty of Industrial Sciences & Technology Universiti Malaysia PahangGambang, Kuantan, Malaysia

^b Center of Excellence for Advanced Research in Fluid Flow (CARIFF)Universiti Malaysia Pahang, Gambang, KuantanMalaysia

^c Department of Pathological Analyses, Al-Haweeja Technical InstituteFoundation of Technical Education, Kirkuk, Iraq

ABSTRACT

The study aimed to isolate cellulolytic bacteria from the gut of subterranean termite (*Coptotermes acinaciformis*) and carry out antibacterial studies for termite control. The cellulase enzyme activity was determined by qualitative and quantitative techniques. The antibiotics and their combinations on isolated bacteria as well as heavy metals and disinfectants were performed by using disc diffusion method. The effective antibacterial agents were used as termiticide. Antibacterial study revealed that the isolates were 100% sensitive to rifampicin, tetracycline, gentamycin and neomycin antibiotics, cadmium and mercury as heavy metals and lactic acid, formalin and hydrogen peroxide as disinfectants. In addition, 17 out of 36 antibiotic combinations showed synergistic effect, while eight combinations showed antagonistic effect on isolates. The heavy metals and disinfectants that showed 100% effectiveness as well as 22 antibiotic combinations that showed synergistic effect were used for termite control. Among the 27 selected antibacterial agents, mercury, lactic acid, formalin and hydrogen peroxide were found to be the most effective termiticide. Therefore, we conclude that these effective antibacterial agents possess a great potential to be a new application to control the termites.

KEYWORDS:

Termiticides; Antibacterial; *Coptotermes acinaciformis*; Disinfectant