

**ISOLATION, CHARACTERIZATION AND IDENTIFICATION OF
POTENTIAL PESTICIDE DEGRADING BACTERIA FROM SOIL AND
INTESTINAL TRACT OF TERMITES FROM AROUND JUJA TOWN IN
THIKA DISTRICT**

HELLEN ADHIAMBO OGOT

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ABSTRACT

The agricultural revolution has led to increased use of chemical pesticides throughout the world. Residues of the applied pesticides persist in the environment (air, soil, ground and surface water) for variable periods. This poses serious threats to biotic environment and indeed can lead to acute and chronic effects on human life causing damage to health or even death. Studies have shown that there are some bacteria in the soil that are able to use some classes of biodegradable pesticides as a source of carbon and energy. Termites also harbour abundant gut microbiota that play an important role in their digestion and degradation of organic matter. Whereas microorganisms that are capable of degrading pesticides have been isolated none have been characterized and identified from termites. This study is aimed at isolating pesticide degrading bacteria from soil and intestinal tract of termites. The bacteria were isolated using MM7 media supplemented with pesticide as the sole source of carbon and energy. Six isolates were obtained out of which four were capable of degrading diazinon and two were able to degrade roundup (isopropylamine salt of glyphosate). The isolates were characterized using morphological, physiological, biochemical and molecular characteristics. 16s rRNA gene sequence analysis showed that diazinon degrading isolate DS₂ (from the soil) is closely related to *Achromobacter xylosoxidans* AF508101 (100%), isolate DT₂ from termite gut is closely related to *Klebsiella oxytoca* AB004754 (99.7%). Whereas isolates DS₃ and DS₅, both from the soil, are closely related to *Enterobacter sp.*, AY082447 (99%). Roundup degrading isolates GT₂, from termite guts and GS₁ from the soil are also related to *Enterobacter sp.*, AY082447. The results of this study highlight the potential of these bacterial isolates to be used in bioremediation.