

**Characterisation of Carbamate Degrading Aerobic Bacteria Isolated from
Soils of Selected Horticultural Farms in
Rift Valley and Central Kenya**

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ABSTRACT

The use of pesticides is very critical in protecting the farmers' investment in seeds, fertilizer and labour since they provide a sure cover from damage by pests. The use of pesticides is therefore inevitable and the environmental pollution due to pesticides and their residues will continue to be a challenge. In this study, bacterial strains capable of degrading methomyl (S-methyl-N-[(methylcarbamoyl) oxy]-thioacetimidate) and carbofuran (2, 3-dihydro-2, 2-dimethyl-7-benzofuranyl methylcarbamate) were isolated from soils sampled from horticultural farms with history of pesticide usage in Rift Valley and Central Kenya. High Pressure Liquid Chromatography (HPLC) was used to monitor biodegradation of both methomyl and carbofuran using reference standards and acetonitrile and water as mobile phases. Complete degradation of carbofuran was observed after 90 days while that of methomyl was observed after 40 days of incubation in mineral salt medium supplemented with either carbofuran or methomyl as the sole carbon source. Partial 16S rDNA sequence analysis indicated that the Carbofuran and Methomyl-degrading strains were closely related to members of the genera *Vagococcus*, *Paracoccus*, *Pseudomonas*, *Providencia*, *Alcaligenes*, *Bacillus* and *Flavobacterium*. The morphological and biochemical characteristics of the isolates also confirmed the phylogenetic signature. The biodegradation capability of the strains isolated in this study make them candidates for application in bioremediation trials in pesticide contaminated soils.