

**Isolation and Characterization of Bacteria from the Intestinal Tracts  
and Nests of Soil-Feeding and Fungus-Cultivating Termites**

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## ABSTRACT

The intestinal tract of soil feeding and fungus cultivating termites harbour a dense community of prokaryotes. Majority of the termite gut microbiota have not been cultured. Termite nests and guts may provide novel bacteria with biotechnological potential. The study focused at isolating and characterizing bacteria from parent soils nests and guts of soil feeding and fungus cultivating termites, to assign the possible roles of the bacteria to nutritional physiology of termites and to assess the ability of the isolates to produce bioactive substances. *Cubitermes ugandensis* Fuller were collected from Kakamega rainforest in Western province Kenya and *Macrotermes michaelseni* Sjöstedt were collected from Juja in Central Province of Kenya. A total of two hundred and eighty six isolates were obtained. There was no significant effect of the pH ( $F=4.164$ ) and different media ( $F=0.871$ ) on the isolation of bacteria from termites. The isolates were screened for the ability to produce enzymes and antibiotics. Fifty isolates with ability to produce bioactive compounds were obtained and were characterized further. A combination of biochemical and morphological characteristics, distinguishing 16s rRNA gene sequences and phylogenetic analyses based on 16s rRNA genes provided strong evidence that isolates belong to the domain Bacteria and class Firmicutes and shared sequence similarity of 86-97% with known members of classes Clostridia, Enterococci, Bacilli and Carnobacteria. Based on results obtained from this study, it can be speculated that the isolates play digestive roles in termites especially protein and carbohydrate hydrolysis.