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Isolation and characterization of mesophilic and thermophilic aerobic bacteria from compost

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The isolation and characterization of mesophilic and thermophilic aerobic bacteria from home made compost was conducted in Gwagwalada, Nigeria and the composting was done for a period of 90 days. Initial temperature of the heap after mixing was 30°C which was higher than the environmental temperature (25 °C). Within a week (15 days), the pile temperature reached 35 °C and then increased to 50 °C on 45th day, as composting proceeded and finally dropped and stabilized at 28 °C (near to ambient) by the 90th day. The thermophilic and mesophilic bacteria isolated during composting were significantly different ($P > 0.05$), *Bacillus cereus*, *Bacillus subtilis* and *Bacillus licheniformis* had the highest number of occurrences, which represented 23.33% each of the total isolates, followed by *Serratia marcescens* which represented 10%. *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Escherichia coli* represented 6.67% each being the least isolates. The quantities of the cellulase enzyme produced showed that *Bacillus subtilis* had the highest cellulase and xylanase activity which give 26.18 ± 0.10 and 24.10 ± 0.12 Enzyme Unit (EU) respectively followed by *Bacillus licheniformis* which produced 25.10 ± 0.20 EU and 22.50 ± 0.20 EU for cellulase and xylanase respectively, *Bacillus cereus* with 22.14 ± 0.11 EU and 20.02 ± 0.02 EU for cellulase and xylanase respectively, *Serratia marcescens* with 20.09 ± 0.14 EU and 18.20 ± 0.18 EU for cellulase and xylanase respectively, *Staphylococcus aureus* with 19.22 ± 0.21 EU and 17.40 ± 0.17 EU for cellulase and xylanase respectively, *Escherichia coli* 18.50 ± 0.50 EU and 16.33 ± 0.25 EU for cellulase and xylanase respectively and *Pseudomonas aeruginosa* 16.20 ± 0.21 EU and 14.11 ± 0.08 EU for cellulase and xylanase respectively being the least value. There was no significant difference between the cellulase and xylanase activities produced by isolated thermophilic and mesophilic bacteria from compost.

Biography

Dr. Salamatu Sangaljala Machunga-Mambula, Associate Professor of Medical Microbiology, University of Abuja, Faculty of Science, Microbiology Department. She received her undergraduate degree in Microbiology from The Ahmadu Bello University, Zaria, Nigeria; Masters degree in Medical Microbiology from the University of Lagos, Nigeria and obtained her Ph.D. degree in Medical Microbiology from Manchester University, UK. She did her postdoctoral training at Boston University School of Medicine, USA in the Department of Infectious Diseases where she studied innate immune responses to fungal infections, with numerous scientific publications on *Cryptococcus neoformans* and *Aspergillus fumigatus*. She became a faculty member at the Harvard Medical School in the Department of Radiation Oncology where she conducted numerous research projects on prostate cancer and heat shock protein that resulted in several publications in international journals. It was during her period at the Harvard Medical School due to her interest in the control of infectious diseases in Nigeria that she developed the concept for the Nigerian Center for Disease Control (NCDC) and had it copyrighted at the Nigerian Copyright Commission. Currently she is an Associate Professor of Medical Microbiology and the Pioneer Head of Department of Microbiology at Faculty of Science, University of Abuja. She was recently won the highly prestigious and highly competitive Africa Centre of Excellence and Food Safety; being one out of the ten awards given in the continent of Africa as a co-investigator. She also was awarded the University Research Grant as the Principal Investigator, funded by Tertiary Education Trust Fund to study Zika Virus in Nigeria. She is currently a Consultant to an environment company, Anelsta Ltd., Nigeria and a Technical Consultant to Integrate Systems, Macon Georgia, USA.

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