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Comparative Studies on the Impact of Bio-Fertilizer Produced From Agro-Wastes Using Thermo-Tolerant Actinomycetes on the Growth Performance of Maize (*Zea-Mays*) and Okro (*Abelmoschus Esculentus*)

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Abstract

The negative effect of chemical fertilizer in the soil has made it imperative for this research to compare the efficacy of using Biofertilizer produced from Agro-wastes as an alternative to chemical fertilizer. Bio-fertilizer was produced in this work by composting mixtures of sawdust plus chicken litter, sawdust plus sewage sludge and sawdust only respectively, using microbial inoculums as the accelerator. Pilot scale study was performed with containers made of polyethylene (PET) as the composter. Actinomycetes were isolated from Soil mixed with Agro waste compost. Characterization of organisms showed that there were six genera of Actinomycetes isolated. Starch Casein Agar was used as the isolation media. Turning over of the compost piles was done twice every week for aeration. Parameters such as N, C, Organic Matter content, temperature etc of the composts were evaluated every 5days interval till the end of composting and the results demonstrated that Organic matter and Carbon content decreased significantly with time in all the compost, nitrogen content of compost A and B increased with time, but nitrogen content of compost C decreased. The highest temperature recorded was 62.1°C after 20days of composting of substrate B. The end product of composting was further evaluated for effectiveness as organic fertilizer in the field studies. The two plants tested in the field were Okro (*Abelmoschus esculentus*) and Maize (*Zea mays*). Results obtained from the experiments showed that Biofertilizer enhanced the growth of Okro and maize and hence has the tendency to replace chemical fertilizer in future with amplified investigations.

Key Words: Actinomycetes, Isolation, Okro, Maize, Composting, Biofertilizer, Chemical fertilizer

1.0 Introduction

In Nigeria, over-dependency on oil as a major source of revenue has shifted everyone's attention away from Agricultural Practice, The current population of Nigeria is 188.9 million as of 2017 based on the latest United Nations Estimate which is equivalent to 2.48% of the total world

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