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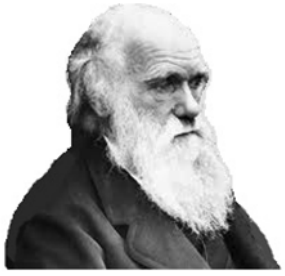

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Potential of *Moringa oleifera* as nutrient–agent for biofertilizer production

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ABSTRACT

The results of this research reveal *Moringa oleifera* to be an effective nutrient-agent for biofertilizer production. Herein, plant analysis data indicate Moringa to be a good nutrient carrier of elements that can enhance effective and productive cultivation of crops, while in-turn maintaining soil fertility status.

***Keywords*:** Biofertilizer, Maize germination, Nutrient agent, Crop Production, Biotechnology

1. INTRODUCTION

Biofertilizer have been view by several researchers to be living or latent cells of strains of microorganisms, which is immobilized on a carrier, by their interactions in the root zone, enabling crops to take up nutrients. Advantages of biofertilizer over mineral fertilizer include eco-friendliness including amenability especially to smallholder farmers. International Federation of Organic Agriculture Movement (IFOAM, 2005) concluded that biofertilizer can be apply for organic farming.

The quality of material is an important factor in determining the potential of any input in a biofertilizer program. Research experiment of Somasegaram and Hoben (1994) point-out: availability in adequate amounts and being inexpensive, non-toxicity to inoculant bacteria strain and plants, good moisture absorption capacity and amenability o processing and

sterilization. Numerous types of materials including agricultural bye-products has been reported by researcher as nutrient agent material for biofertilzer production. Plant material such as *Moringa oleifera* are available in reasonable quantity in many developing countries. *Moringa oleifera,* known with common name as drum stick is native to parts of Africa and Asia, the multipurpose tree native to the foothills of the Himalayas in northwest India. The tree has been found useful in herbal medicine, nutritional including it utilization in the area of biotechnology. Moringa has the potential to improve nutrition, boost food security, foster rural development and support sustainable soil nutrient.

Research findings of presented Moringa been used to increase soil fertility. Moringa leaves have been reported as the most nutritious part of the plant. Vitamins, Manganese including protein have been investigated to be among the nutritional value of Moringa leaves. Moringa tree can easily be seen in various location in Africa including Nigeria, especially where the weather condition is conducive the tree.

Being abundant, with little economic value in many developing countries, *Moringa oleifera* meet some basic requirements to be used as a nutrient-agent for biofertilizer production. This study was conducted to confirm the potential of *Moringa oleifera* as a nutrient-agent for biofertilizer production.

2. MATERIALS AND METHODS

Study Location

The study was carried out in Obubra, location of the Faculty of Agriculture and Forestry, Cross River University of Technology (CRUTECH), Nigeria. Obubra is on latitude 6º 06' N and longitude 8º 18' E in the rainforest zone of Nigeria. The study was conducted in 2013 and 2014. Obubra is characterized by a mean annual rainfall distribution at 2250 mm – 2500 mm with annual temperature range at 25-27 °C. Plant analysis of Moringa leaves was carried out in the biochemistry laboratory at CRUTECH.

Carrier Materials

Fresh Moringa leaves were obtained from different location within Obubra Communities. The leaves were grinded lightly, then sterilized by autoclaving. Curing was carried out at room temperature or 7 days to allow microbes to act on the material.

Chemical Composition Analysis of Carrier Material

Analysis of Moringa leaves was done using procedures for plant analysis as described by Ryan et al. (2001)

Carrier Materials

Biofertilizer produced after curing was dried at 40 °C to moisture content of 18% then store at room temperature for the entire duration of this study. Viability of the biofertilizer was tested by germinating maize seed (Ikom Local White) after 5 days in a medium containing the biofertilizer and laboratory soil (tested to be too low to support crop germination).

3. RESULTS AND DISCUSSION

The result of the experiment shows *Moringa oleifera* been active, effective, and productive as a nutrient-agent in biofertilizer production. Nitrogen (N), Phosphorus (P) including Sodium (Na) content of the material seems sufficient for the material to be used as a biofertlizer material in the field of soil fertility management and crop production. Organic Carbon (Org. C) and Carbon-Nitrogen ratio (C:N) of the material also presented the material as adequate for soil fertility improvement.

Table 1. Nutrient Composition of *Moringa oleifera* Leaves in Obubra.

***Moringa oleifera* Leaves**	**N (%)**	**P (%)**	**K (%)**	**Ca (%)**	**Mg (%)**	**Na (%)**	**Org. C (%)**	**C:N**
	4.02	1.17	1.80	12.3	0.10	1.16	11.1	2.8

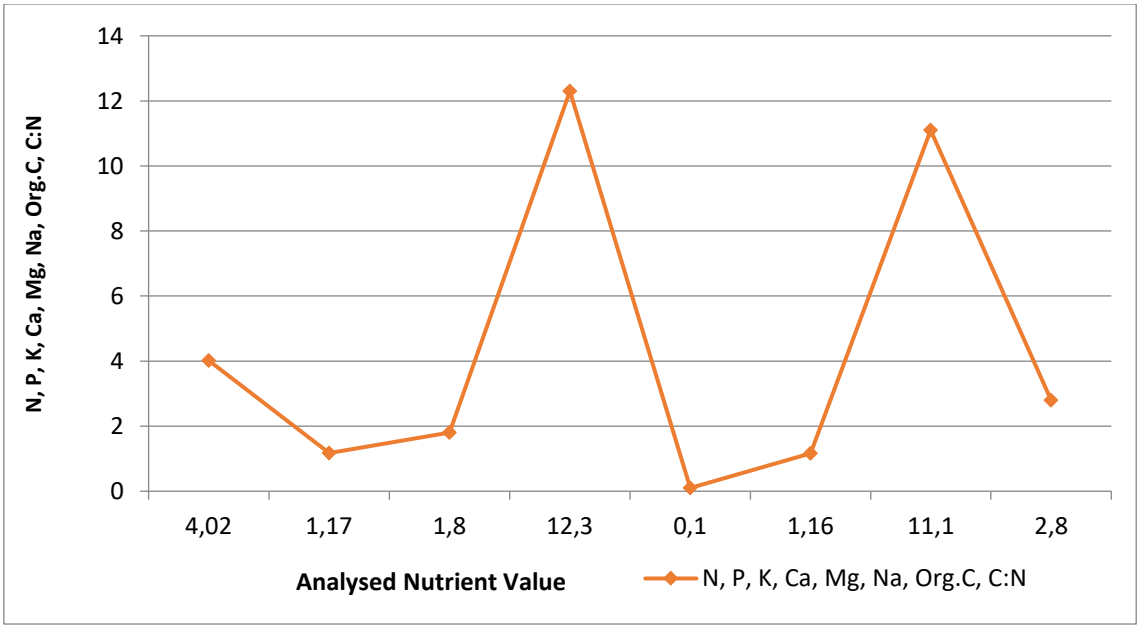

Figure 1. Nutrient Analysis of Moringa oleifera Leaves in Obubra, Nigeria

The ability of the material to aid the crop germination proves the produce biofertilizer to be effective, presenting that the material can be use efficiently as a biofertilizer material, this finding agress with the experimental findings where their various experiment present Moringa as effective when used to seek for soil fertility improvement and increase crop growth.

The effectiveness of Moringa leaves as a potential nutrient-agent for biofertilizer production as represented in (Figure 1) indicated that as a measure to increase soil fertility and increase crop growth/production, *Moringa olieifera* leaves can be utilized in production of biofertilizer.

4. CONCLUSION

Result of the experiment proves *Moringa oleifera* as been effective nutrient-agent for biofertilizer production, hence, increasing crop growth, while improving soil fertility status.

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