

## Comparative Analysis of Biodegradation on Polythene and Plastics Buried in Fadama Soil Amended With Organic and Inorganic Fertilizer

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**Abstract :** The aim of this research is to compare the analysis of biodegradation on polythene and plastics buried in fadama soil amended with Organic and Inorganic fertilizer. Physico- chemical properties of the samples were determined. Bacteria and Fungi implicated in the biodegradation were identified and enumerated. Physico- chemical properties before the analysis indicated pH range of the samples from 4.28 - 5.80 , While the percentage Organic carbon and Organic matter was highest in cow dung samples with 3.89% and 6.69% respectively. The total Nitrogen percentage was recorded to be highest in Chicken dropping (0.68), while the availability of Phosphorus (P), Sodium (Na), Pottasium (K), and Magnesium (mg) was recorded to be highest in F - soil (Control), with values to be 37ppm, 1.63 Cmolkg-1, 0.35 Cmolkg-1 and 1.18 Cmolkg-1 respectively, except for calcium which was recorded to be highest in Cow dung (5.80 Cmolkg-1). However, physico - chemical properties of the samples after analysis indicated pH range of 4.6 - 5.80, Percentage Organic carbon and Organic matter was highest in Fadama soil mixed with fertilizer, having 0.7% and 1.2% respectively. Total Percentage Nitrogen content was found to be highest (0.56) in Fadama soil mixed with poultry dropping. Availability of Sodium (Na), Pottasium (K), and Calcium (Ca) was recorded to be highest in Fadama Soil mixed with Cow dung with values to be 0.64 Cmolkg-1, 2.07 Cmolkg-1 and 3.36 Cmolkg-1 respectively. The percentage weight loss of polythene and plastic bags after nine months in fadama soil mixed with poultry dropping was 11.9% for polythene and 6.0% for plastics. Weight loss in fadama soil mixed with cow dung was 18.1% for polythene and 4.7% for plastics. Weight loss of polythene and plastic in fadama soil mixed with fertilizer (NPK) was 7.4% for polythene and 3.3% for plastics. While, the percentage weight loss of polythene and plastics after nine months of burial in fadama soil (control) was 3.5% and 0.0% respectively. The bacteria species isolated from Fadama soil, organic and inorganic fertilizers before amendments include: *S. aureus*, *Micrococcus* sp, *Streptococcus. pyogenes*, *Psuedomonas aeruginosa* *Bacillus subtilis* and *Bacillus cereus*. The fungi species include: *Aspergillus niger*, *Aspergillus fumigatus*, *Aspergillus flavus*, *Fusarium* sp, *Mucor* sp *Penicillium* sp and *Candida* sp. The bacteria species isolated and characterized after nine months of seeding include: *S. aureus*, *Micrococcus* sp, *S. pyogenes*, *P. aeruginosa* and *B. subtilis*. The fungi species are: *A. niger* *A. flavus*, *A. fumigatus*, *Mucor* sp, *Penicillium* sp and *Fusarium* sp. The result of this study indicated that plastic materials can be degraded in the fadama soil irrespective of whether the soil is amended or not. The Period of composting also has a significant impact on the rate at which polythene and plastics are degraded.

**Keywords :** Fadama, fertilizer, plastic and polythene, biodegradation

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