

Handling of Vegetable, Fruit, and Livestock Waste by Making Liquid Organic Fertilizer Based on Local Microorganisms

by Suhartini, Bernadetta Octavia, Anna Rackmawati

ABSTRACT

There are many negative impacts from the use of chemical fertilizers and chemical pesticides on the environment and soil, so the government has been promoting organic farming toward sustainable agricultural development. A large amount of vegetable and fruit waste in markets has prompted researchers to address the problem of waste originating from vegetable and fruit scraps produced by vegetable and fruit traders, along with livestock waste, which is always produced in households to be used as raw material. manufacture of Liquid Organic Fertilizer (POC). Therefore this study aims to 1. Determine the Quality of Liquid Organic Fertilizer (POC) from various wastes containing local Microorganisms (MOL) 2. Identify local Microorganisms that play a role in the fermentation of various kinds of vegetable, fruit, and livestock waste into Organic Fertilizer Liquid (POC). Identification of microbes is the initial step to obtaining local microorganisms which are expected to be used as starters if you want to make Liquid Organic fertilizers. Through the use of Liquid Organic Fertilizers from various types of waste, it is hoped that healthy plants will be obtained and free from chemical fertilizers to lead to organic and environmentally friendly farming. Besides that, it also inspires organic farmers to utilize materials available in their environment as natural fertilizers and pesticides

The research was carried out at the Compost Laboratory, Department of Biology Education, Faculty of Mathematics and Natural Sciences, Yogyakarta State University from May to September 2022. Making Liquid Organic Fertilizer (POC) from various kinds of Local Microorganism-based waste (MOL) in waste vegetables, fruits, and livestock manure. POC production is carried out by fermentation using a POC reactor which is made of a closed bucket and connected to a hose to an aqua bottle filled with water. There were 6 treatments, namely a fruit waste: Vegetables: livestock = 1: 1: 1, b. 2: 1: 1, c. 1 : 2: 1, d. 1: 1: 2, e. 2 : 2: 1 and f. 2: 1: 2. Each treatment with 3 replications so that there are 18 POC reactors. Fermentation is carried out for 24 days, then the chemical analysis is carried out, and the results are compared with the Liquid Fertilizer standard according to the Decree of the Minister of Agriculture Number 261 of 2019. POC quality tests include nutrient content such as total N, available P (P2O5), available K (K2O), pH, C-organic, and C/N ratio which was carried out at the Yogyakarta Agricultural Technology Study Center laboratory, while metagenome analysis determined the microbial genera present in POC was carried out at the Genetics Science Laboratory, Jakarta.

The results showed that 1. the quality of Liquid Organic Fertilizer (POC) from various fruit, vegetable, and livestock wastes based on physical and pH tests met the Liquid Organic Fertilizer standard, but the chemical tests for nutrients N, P, and K did not meet the POC standard according to the Ministerial Decree Agriculture Number 261 of 2019 concerning Minimum Technical Requirements for Organic Fertilizers, Biological Fertilizers, and Soil Improvers. 2. The results of metagenome analysis of local microorganisms that play a role in the fermentation of various kinds of vegetable, fruit, and livestock waste into Liquid Organic Fertilizer (POC) found OTUs bacteria 347 and OTUs fungi 307. There is also a diversity of Shannon bacteria, all stages have a high category while fungi have a medium category.

Kata Kunci: *Liquid Organic Fertilizer, vegetable, fruit and livestock waste, local microorganisms.*