

## SUMMARY

**DHIAS LUPITA SARI. 105040201111185. Diversity of non-symbiotic Nitrogen Fixing Microb on Robusta Coffee Plant at plantation of PTPN XII Bangelan Malang, Jawa Timur. Supervised by Yulia Nuraini and Budi Prasetya.**

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Coffee is one of the important plantation crops and export commodities which may include bringing a source of foreign exchange for the country. Today in organic fertilizers became the main stay in maintaining and enhancing agricultural productivity. From all types of organic fertilizers are used as agricultural inputs, the nitrogen fertilizer is the most widely and intensively used by farmers. To reduce dependence on inorganic nitrogen fertilizers, needed a new breakthrough in the field of agriculture. There are several approaches that can be done such as micro irrigation, organic farming, and bacterial utilization of plant root growth promoter (BPPT). Under the terms of which have been described above, it is need to explore and develop for non nitrogen fixing bacteria symbiotic in Malang Bangelan Gardens, which will be developed and used as a biological fertilizer. The purpose of this study selecting and searching for potential microbial N in organic robusta coffee crops and conventional and determining the effect of fertilization on microbial populations N fastening according to the depth of the coffee plants and conventional organic. The hypothesis is soil microbial fastening non-symbiotic N can be isolated from coffee crops with conventional and organic treatments. The second hypothesis kopi plant maintenance treatment with organic fertilizers more microbial population of the coffee plant maintenance treatment with inorganic fertilizer. The experiment was conducted at the Laboratory of Microbiology, State University of Malang. Soil sampling conducted in coffee crops Bangelan PTPN XII, Malang. This study began in March 2014 until July 2014. The tools used in the field of soil sampling is ground drill, ruler, and plastic. While current tools used in the analysis is erlenmeyer, test tubes, petri dishes, laminar air flow, micro pipettes, tips, oven, autoclave, and incubators. The medium used for the isolation of microbes include LG media for isolation of bacteria *Azotobacter sp* and Nitrogen Fixation Bacteria selection media (NFB). Soil sample used consisted of 2 different locations, namely 1. Coffee Crop organic with fertilizer treatment; 2. Coffee plants with inorganic treatment. At each location, soil samples were taken 2 consists of 3 different depths, namely: a. depth of 0-10 cm, b. depth of 10-20 cm, c. depth of 20-30 cm. One plot of land contained decision point 5 with a depth of 0-10 cm, 10-20 cm depth, and the depth of 20-30 cm and then 5 points with a depth of 0-10 composited and taken 200 grams as well as the next depth. The research method used is then followed by a survey method in laboratory experiments. Implementation of the study consisted of a series of activities, namely: 1) preparation tools and materials, 2) Isolation of bacteria, 3) calculation of the number of microbes, 4) the selection of microbes, 5) test the purity of the isolates, 6) nitrogen fixation test, 7) characterization. The population of non-symbiotic N fastening bacteria present in most samples of PO (Organic Treatment) at a depth of 0-10 cm is  $128.5 \times 10^3$  CfU/ g of soil, and the

smallest population of  $34.5 \times 10^3$  Cfu/ g of soil found in soil samples PNO (non-organic) at a depth of 20-30 cm. The results of the isolation of non-symbiotic bacteria N fastening at get 10 isolates with isolates code PNO1, PNO2, PNO3, PNO4, PNO5, PO1, PO2, PO3, PO4, PO5. Of the 10 isolates had colony color, form diverse cell. The result of nitrogen fixation in getting isolates have enormous potential to tie up nitrogen is isolate with code PO4 with 0.55 cm thick pellicle formation.

