

**Asrie Isnia Karina, 2016. Isolasi dan Identifikasi Bakteri Penambat Nitrogen, Pelarut Fosfat, Dan Bakteri Pendegradasi Selulosa Pada Tanah Bekas Tanaman Bawang Merah (*Allium Cepa*) yang Diberi Biofertilizer. Skripsi ini dibawah bimbingan Prof. Dr. Ir. Tini Surtiningsih, DEA dan Dr. Sucipto Hariyanto, DEA. Program Studi Biologi. Departemen Biologi. Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya.**

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### **ABSTRAK**

Penelitian ini bertujuan untuk mengetahui jumlah total populasi bakteri (TPC) serta genus bakteri penambat nitrogen, pelarut fosfat dan bakteri pendegradasi selulosa pada tanah bekas tanaman bawang merah (*Allium cepa*) setelah pemberian *biofertilizer*. Bakteri penambat nitrogen diisolasi dengan menggunakan media NFB (*Nitrogen Fixing Bacteria*) semi-solid dengan metode MPN (*Most Probable Number*). Bakteri pelarut fosfat diisolasi dengan menggunakan media Pikovskaya dengan metode *pour plate*. Bakteri pendegradasi selulosa diisolasi dengan menggunakan media CMC (*Carboxyl Methyl Cellulase*) dengan metode *pour plate*. Hasil menunjukkan adanya keberadaan bakteri penambat nitrogen dengan perubahan warna pada media NFB semi-solid dan terbentuknya cincin putih dengan jumlah bakteri 2400/100mL. Adanya keberadaan bakteri pelarut fosfat ditunjukkan adanya zona halo disekitar koloni pada media *Pikovskaya* dengan jumlah bakteri  $1,27 \times 10^5$  cfu/mL. Adanya keberadaan bakteri pendegradasi selulosa ditunjukkan dengan adanya zona halo disekitar koloni pada media CMC dengan jumlah bakteri  $2,19 \times 10^5$  cfu/mL. Dan total jumlah bakteri keseluruhan dalam tanah yang diisolasi dengan media NA (*Natrium Agar*) yaitu sebesar  $3,06 \times 10^{17}$  cfu/mL. Didapatkan 3 isolat murni bakteri penambat nitrogen, 2 isolat murni bakteri pelarut fosfat dan 2 isolat murni bakteri pendegradasi selulosa yang teridentifikasi hingga tingkat genus. Isolat bakteri yang teridentifikasi sebagai bakteri penambat nitrogen yaitu genus *Azotobacter*, *Azospirillum* dan *Rhizobium*, isolat bakteri pelarut fosfat yaitu *Bacillus* dan *Pseudomonas* dan isolat bakteri pendegradasi selulosa yaitu *Saccharomyces* dan *Cellulomonas*.

**Kata kunci** : jumlah total bakteri (TPC), bakteri penambat nitrogen, bakteri pelarut fosfat, bakteri pendegradasi selulosa

**Asrie Isnia Karina, 2016. Isolation and Identification of Nitrogen Fixing Bacteria, Phosphate Dissolving Bacteria, and Cellulose Degrading Bacteria on Used Soil by *Allium Cepa* L. After Giving of Biofertilizer. This thesis is under the guidance of Prof. Dr. Ir. Tini Surtiningsih, DEA and Dr. Sucipto Hariyanto, DEA. Biology Course. Department of Biology. Faculty of Science and Technology, Airlangga University, Surabaya.**

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### **ABSTRACT**

The purpose of the research to know the amount of total population of bacteria (TPC) as well as the genus of nitrogen fixing bacteria, phosphate dissolving bacteria and cellulose degrading of bacteria on the soil of the former plants of onion (*Allium cepa*) after the giving of biological fertilizer. Bacteria isolated of nitrogen fixing bacteria using NFB media (Nitrogen Fixing Bacteria) semi-solid and using MPN (Most Probable Number) method. The phosphate dissolving bacteria was isolated by using media Pikovskaya with pour plate. The cellulose degrading bacteria isolated by using CMC (Carboxyl Methyl Cellulase) with pour plate method. The results indicate the presence of Nitrogen fixing bacteria with changing the colors of NFB media semi-solid and the formation of a white ring with the number of bacteria 2400/100 mL. The existence of phosphate dissolving bacteria indicated the presence halo zone around the colonies zone media Pikovskaya with number of  $1,27 \times 10^5$  cfu/mL bacteria. The presence of cellulose degrading bacteria existence demonstrated by the existence of a halo zone around the colonies on CMC media with  $2,19 \times 10^5$  cfu/mL bacteria. And the total number of bacteria overall in the soil was isolated with the media NA (Natrium Agar) are  $3,06 \times 10^{17}$  cfu/mL. Obtained 3 isolates pure nitrogen fixation bacteria, 2 bacteria isolates pure phosphate dissolving bacteria and 2 isolates of bacterial cellulose degradation which is identified to the genus level. The bacterial that identified as nitrogen fixing bacteria, are the genus *Azotobacter*, *Azospirillum* and *Rhizobium*. Isolates of phosphate dissolving bacteria are *Bacillus* and *Pseudomonas*. Isolates of cellulose degradation bacteria namely *Saccharomyces* and *Cellulomonas*.

**Keywords :** “Total Plate Count” (TPC), genus of Nitrogen Fixing Bacteria, Phosphate dissolving bacteria, and cellulose degrading bacteria