ISOLATION OF CELLULOSE DEGRADING BACTERIA (CDB) FROM OIL PALM PLANTATION SOIL

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TABLE OF CONTENTS

ABSTRACT

ISOLATION OF CELLULOSE DEGRADING BACTERIA (CDB) FROM OIL PALM PLANTATION SOIL

Cellulose is one of the most abundant carbon sources and it easily found on earth. However, cellulose also have unique structure which is straight chain polymer and difficult to degrade. Fortunately, there are certain microorganisms have the capability to synthesis cellulase and able to degrade the complex nature of cellulose structure. This microorganism is known as Cellulose Degrading Bacteria (CDB). Therefore, the aims of this study were included to isolate the Cellulose Degrading Bacteria, to assess the cellulolytic potential and optimizing the growth condition of Cellulose Degrading Bacteria (CDB) by focusing on three types of parameters which are temperature, pH and incubation periods. A total of five isolates bacteria were obtained from soil sample. Out of the five isolated bacteria, only three isolated bacteria which are bacteria A, D and E were showed the presence of hydrolysis zone by Iodine test. Since the hydrolysis zone is small and not clearly seen, all five isolated bacteria were prescreening with DNS method to determine the cellulolytic potential. Only three out of five bacteria exhibit the cellulase activity ranged from 0.059 μmol/ml to 0.070 μmol/ml after four days incubation. The highest cellulase activity was recorded by Bacteria E with 0.070 μmol/ml. The Bacteria E was selected to enhance the production of cellulase. The results of this study revealed the optimization temperature, pH and incubation periods are 37° C, pH 6 and 5 days respectively. From optimization, the cellulase activity increase up to 0.250 μmol/ml. As a conclusion, Bacteria E has the potential bacteria which able to degrade the complex structure of cellulose.