ISOLATION AND SCREENING OF OIL-DEGRADING BACTERIA FROM OIL-CONTAMINATED SOILS

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JULY 2020

ACKNOWLEDGEMENTS

I feel thankful to the Almighty for the blessing that was given to me throughout this final year project. Although the beginning of 2020 is not a good start due to Covid-19 outbreak, I still able to complete this task with the help and support from many parties. Therefore, I would like to express my gratitude for those who were directly and indirectly involved during the processes.

First and foremost, my appreciation goes to my supervisor, Dr. Lo Chor Wai because of her willingness to support and guide me along this project. Without a guidance, advices and support from her, I will not be able to complete my research successfully. Her willingness to give her time so generously has been very much appreciated I am particularly grateful for the assistance given by our final year project coordinator Mr. Ajimi Jawan because he never wearies to give us information, guidance and advices.

Besides, I would like to thank our laboratory assistance, Mrs. Dayang Nursyafiqah, and Mr. Hanafi for assisting me in providing the necessary equipment throughout this project. I am also grateful for the encouragement from my classmate's member Ericka, Azierah, Nur Syahfitriani, Verniun, Morini and Hanie for being involved directly and indirectly during the processes. Finally, my appreciation goes to my beloved parents and family for all the support motivation and encouragement throughout this research. Without them I wouldn't be able to complete this final year project successfully. Thank you.

(Sudyla Philip)

TABLE OF CONTENT

ABSTRACT

ISOLATION AND SCREENING OF OIL-DEGRADING BACTERIA FROM OIL-CONTAMINATED SOILS

Bioremediation is a process which uses microorganisms or plants to remove toxic hydrocarbons, heavy metals, and other volatile organic compounds. This study focus on the isolation of oil-degrading from two soil samples taken from a car workshop and a parking lot which is located at the University Condominium Apartment, Jalan Menggatal, Kampung Dambai, Sabah. A total of eight isolates were obtained from both samples and were subjected to phenotypic and biochemical characterization using Gram-staining, endospores staining and catalase test. All of these isolates have undergone biochemical test for classification purposes which were Gram-staining, endospores staining and catalase staining. There were three Gram positive bacteria and five Gram-negative bacteria and all isolates produced catalase enzyme. However, no sporulation detected in all isolates. The colony colours that were found among these isolates were milky white, milky yellowish, pink, yellowish, light brown, white and greenish. Under microscopic examination, the isolates were cocci, coccobacilli and bacilli. Four isolates were selected for their degradation ability (Sample 1: S1-3 and S1-4; Sample 2: S2-2 and S2-3). S2-2 was found to degrade diesel oil more compared to the other isolates by 2.6%. The characteristics of S2-2 were light brown colour colony, had bacilli shape, Gram- positive bacteria, no spore and had catalase enzyme. The nearest suggested family of oil-degrading bacteria according to these characteristics was Pseudomonadaceae from Eubacteriales order. Further analyses such as molecular identification using 16S rRNA gene, GC-MS to measure the oil degradation and optical density (OD) measurement to measure the growth of bacteria cultures are recommended.