THE EFFECT OF pH AND TEMPERATURE TO WATER HYACINTH IN REMOVING HEAVY METALS IN WATER

SITI ZULAIKHA BINTI MUHAMAD SUKOR

BACHELOR OF SCIENCE (Hons.) BIOLOGY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA

JULY 2019

ACKNOWLEDGEMENTS

Firstly, all praises due to Allah SWT which without His blessing, this final year project report may not be able to be completed. Secondly, I would like to take this opportunity to thank everyone who have helped and guide me in finishing this research project and I would like to express my heartfelt gratitude and appreciation to my supervisor and the coordinator for this code, Mr. Ajimi Jawan who had guided me throughout the duration of this research study. I appreciate the valuable time, guidance and advices he had given to me upon completion of this research project.

Moreover, I would also like to thank the lecturers who have guided me directly or indirectly with the new insights and ideas on the path of completing this study. Besides, I deeply appreciate the moral support, understanding and endless love in which my family have given throughout the process, especially my father and my mother whose have been greatly helped me throughout this research project journey and not forget my siblings whose have been a great helper which keep supporting me and gives a good word for me to keep struggling positively in finishing this report. Special thanks to my younger sister, Nurul Aina binti Muhamad Sukor for the positive words and vibes from her.

Lastly, the cooperation and support received from all the members who contributed to this research was important in making this project successful. I personally thank my friends who are Elsyazana, Fatin Nadhirah, Nurul Syazwani, Nur Nadhirah binti Ranizam, Ain Suhana, Nurul Afifah binti Nasir, also my coursemates, Adibah Hannisa binti Ahmad Suhaimey, Salsyanney Nasir, Hazmeen binti Osman, Iqmal Sapawi, Mohd Musawwir, all my friends and to all lab assistant at KOMSAT that have contributed together in helping me completing this research. The suggestions, ideas that been given by them enhanced me throughout this project.

Siti Zulaikha binti Muhamad Sukor

TABLE OF CONTENTS

ABSTRACT

THE EFFECT OF pH AND TEMPERATURE TO WATER HYACINTH IN REMOVING HEAVY METALS IN WATER

Water hyacinth is a plant that are easy to get with low cost and proved effective by recent researchers. This study used phytoremediation process which water hyacinth plant tested to remove heavy metals element in water. Analyzing of heavy metals concentration were using machine Atomic Absorption Spectrophotometer Brand Agilent 240 AA. The purposes of this study are evaluation of percentage removal of Pb and Mn by water hyacinth in water, to analyze the affinity of water hyacinth towards absorption of Pb and Mn, further to assess the effect of pH and temperature with removal of Pb and Mn. The result showed a significant difference between three different pH with percentage removal of both heavy metals Pb ($p= 0.024$) while Mn ($p= 0.001$). Water hyacinth plant have higher percentage removal of heavy metals for both heavy metals. Besides that, result showed that there is a significant difference ($p= 0.009$) which indicates that water hyacinth has more tendency to remove heavy metal Pb compared to heavy metal Mn with average difference in concentration Pb is 4.07 ppm which higher than Mn which is 0.54 ppm. From correlation test, it is found that only pH has significantly reducing the difference in concentration for Pb and Mn with $r_s= 0.837$, $p= 0.038$ and $r_s= 0.956$, $p= 0.003$ respectively. When pH level increase, the difference in concentration for Pb and Mn also increase. This showed that removing of heavy metals in water is more effective when heavy metals solution reacts with higher pH. Temperature does not affect in this study ($p= 0.326$) for Pb, ($p= 1.000$) for Mn. For recommendation, further study on others heavy metals should be done to compare the results to improve the study.