THE EFFECT OF SLUDGE AS ARTIFICIAL SOIL FOR
AGRICULTURE

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Universiti Malaysia Terengganu (UMT)

THE USAGE OF SLUDGE AS ARTIFICIAL SOIL FOR AGRICULTURE

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JABATAN SAINS KEJURUTERAAN
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BORANG PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

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LIST OF ABBREVIATION

Abbreviation	
Cd	Cadmium
Zn	Zinc
Cu	Copper
Ni	Nikel
Pb	Plumbum
Cr	Cromium
Hg	Merkuri
F	Florine
Ag	Argentum
Au	Aurium
Sn	Stanum
Si	Sikilon
Mg/l	Miligram per liter
ppm	Part per milion
$CaCO_3$	Calsium Carbonat
Kg	Kilogram
CO_2	Carbon Dioxide
HNO_3	Acid Nitric

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APPENDIX

A	Tomato data
B	Tomato growth result
C	AAS Result

ABSTRACT

The use of sewage sludge as an organic fertilizer has become a common practice. It is considered a viable alternative to landfill or incineration as disposal method. Composted organic used as substrates could be a feasible option, especially sewage sludge due its high production. Heavy metal contamination in sludge can pose long term environment problems. The objectives of this study are, to determine the advantages of using sludge as artificial soil for agriculture , to investigate the present and concentration of the heavy metals and in plant and to compare the tomato growth using commercial composed and sewage sludge. Sewage sludge was collected from Indah Water Terengganu. Tomato (*Lycopersicon escuertum*) was used for plant indicator. The length and weight of root and shoots were taken. The plants were then oven dried and the dry weight yield of shoots and roots were taken. Sample were digested and then analyzed for heavy metals using (*Perkin Elmer Analyst 800 atomic absorption spectrophotometer*). Tomato in sludge shows increase in length and dry weight of root, shoots and leaves compare to compost. Tomato in sludge produces more fruit and leaves than compost, high nutrient content in sludge affect the producing factor. Heavy metal content in sludge were used in research were low and not exceed the permission level. The highest Cu, Cd and Zn level were found at root with concentration 5.2662mg/l, 0.0759mg/l and 32.03mg/l. Concentration Cd in fruits is varies from 0.013 to 0.0113mg/l, in Cu from 1.2 to 1.9mg/l and Zn from 7.7 to 9.038mg/l.Sludge can be an important source of plant nutrient which is macro and micronutrient for agriculture. Heavy metal uptake were very low in plant therefore sludge can be used for agriculture.

ABSTRAK

Penggunaan enap cemar sebagai baja organik sudah menjadi kebiasaan. Ini adalah cara pelupusan yang berkesan berbanding dilupuskan ditapak pembuangan atau dibakar. Cara ini amat sesuai berikutan penghasilan enapan najis yang semakin tinggi. Bagi kesan jangka masa panjang,pencemaran logam-logam berat dalam enapcemar boleh menimbulkan pencemaran alam sekitar. Tujuan kajian ini adalah untuk mengkaji kehadiran dan kepekatan logam berat dalam enapcemar, mengkaji kelebihan mengunakan enapcemar sebagai tanah tiruan dan mengkaji perbezaan pertumbuhan pokok tomato dengan menggunakan enapcemar dan tanah untuk perkebunan. Enapcemar yang diambil dari Indah Water Konsurtium. Pokok tomato (*Lycopersicon escuertum*) digunakan sebagai tanaman penunjuk. Panjang dan berat diambil bagi setiap peringkat pertumbuhan. Berat kering batang dan akar diambil. Sampel dicerna dan dianalisa menggunakan (*Perkin Elmer Analyst 800 atomic absorption spectrophotometer*) (Perkin Elmer, Harare). Tomato yang ditanam menggunakan enapcemar menunjukan perbezaan ketara berbanding tanah untuk perkebunan dari segi panjang dan berat kering. Tomato yang ditanam dalam enapcemar menunjukan pertumbuhan pesat dari segi penghasilan buah dan mempunyai daun yang banyak. Kandungan logam berat dalam pokok tomato tidak melebihi paras yang ditetapkan. Kandungan Cu, Cd dan Zn paling tinggi didapati didalam akar ialah dengan kepekatan 5.2662mg/l, 0.0759mg/l dan 32.03mg/l. Enapcemar membekalkan nutrisi yang penting untuk tumbuhan. Kandungan logam berat dalam tidak melebihi paras bahaya oleh itu enapcemar boleh digunakan untuk pertanian.