

## CERTIFICATE OF ANALYSIS

Name of Customer : DR AHMAD BUKHARY  
Address : School of Biological Sciences, Universiti Sains Malaysia  
11800 USM Gelugor, Pulau Pinang.  
Tel. No. : 012-304 5007  
Sample Description : One (1) sample described as *INSECT FRASS FERTILIZER SPECIES HERMETIA ILLUCENS*  
Sample Ref. No : U0494/21

### ANALYSIS RESULTS

(As per sample)

Parameter, Unit	Result		Test Method / Equipment / Technique
Nitrogen, % (w/w)	3.03	3.05	Nitrogen: In-house method no. STP/Chem/A03 based on AOAC 20 <sup>th</sup> Edi. 981.10
Calcium, mg/kg	3407.72	3451.78	Microwave Digestion – AAS
Potassium, mg/kg	66129.03	66148.99	Microwave Digestion - AAS
Magnesium, mg/kg	2555.20	2501.83	Microwave Digestion – AAS
Phosphorus, mg/kg	11174.76	11302.29	Microwave Digestion – MP/AES

**Remarks:**

- a. Opened / balance samples will be discarded two weeks after issuance of Certificate of Analysis.

  
NOR AIN SYUHADA ZUHAIMI  
Laboratory Executive  
UNIPEQ SDN BHD (870956-D)

This report refers to the tested sample only. Sampling is not carried out by our organization. All analysis are carried out to the best of our knowledge and ability and our responsibility is limited to the correctness of the result. This report is issued on the understanding that it does relieve parties concerned from their contractual obligations. This report shall not be reproduced except in full without written approval of the laboratory.

Our Ref : ACL/MIS-OTH 210812/A

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
 School of Biological Sciences  
 G08 Building, Universiti Sains Malaysia  
 11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as Insect Frass Fertilizer Species  
 Hermetia Illucens

### Results of Analysis

Parameter	Unit	Method	Results
pH	-	In House based on APHA 4500 H <sup>+</sup> B	9.1
Total Organic Carbon	%w/w	MS678:Pt I to IV:1980	25.3
Total Organic Matter	%w/w	In House	79.7
Sulphur as S	mg/kg	ICP-OES	6,100
C/N Ratio	-	By Calculation	10.2

Note:

"<" denote "Less Than"



MOHD BADRULLAH BIN BUANG  
 BSc(Hons), LMIC  
 IKM Registered Chemist : L/2784/8241/18

### Certificate of Analysis

Lab Ref No.: **UL2107-A00635**

SN: **RS9895076130887385**

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Noor Azinah Maamin  
 Chemist & Food Analyst  
 IKM No. : M/1973/4360/03 Food Analyst No: MJMM 0622  
 AN1: RA2248254872938105

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 SCHOOL OF BIOLOGICAL SCIENCE  
 G08 BUILDING  
 UNIVERSITI SAINS MALAYSIA  
 11800 PULAU PINANG  
 MALAYSIA

Sample Marking: **INSECT FRASS FERTILIZER SPECIES HERMETIA ILLUCENS**  
 Sample Description: **FERTILIZER**

*Remarks:*

1. *Opened / balance samples will be discarded two weeks after issuance of Certificate of Analysis.*

Test Description	Unit	Result(s)	Test Method/Equipment/Technique
Total Ash	%w/w	22.9	In-house Method No: STP/Chem/A05 based on AOAC 20th Edition: 923.03

**- END OF REPORT -**

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Our Ref : ACL/MIS-OTH 220309

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
School of Biological Sciences  
G08 Building, Universiti Sains Malaysia  
11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as **Fertilizer**  
**Marking: Insect Frass Species Hermetia Illucens**

**Results of Analysis**

Parameter	Unit	Method	Results
Cation Exchange Capacity	meq/100g	MS 678: Pt. I to V :1980	32.9
Conductivity	μS/cm	MS 678: Part VI to IX :1980	7,940

Note:

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Our Ref : ACL/MIS-OTH 220288

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
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Sample description : Received one (1) samples labelled as **Insect Frass Fertilizer Species**  
**Hermetia Illucens**

**Results of Analysis**

Parameter	Unit	Method	Results
Ammonium	mg/kg	Ion Chromatography	4003.3
Nitrate	mg/kg	Ion Chromatography	0.1
Nitrite	mg/kg	Ion Chromatography	0.04

Note:

"ND" denotes "Not Detected"

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Our Ref : ACL/MIS-OTH 220348  
Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
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11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as **Fertilizer**  
**Marking: Insect Frass Species Hermetia Illucens**

**Results of Analysis**

Parameter	Unit	Method	Results
Crude Fiber	% w/w	MS 1414 (1997)	22.2

Note:

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Our Ref : ACL/MIS-OTH 220367

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
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11800 USM Pulau Pinang


Sample description : Received one (1) samples labelled as **Fertilizer**  
**Marking: Insect Frass Species Hermetia Illucens**

**Results of Analysis**

Parameter	Unit	Method	Results
Total Iron as Fe	mg/kg	ICP-OES	1,175.0

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Our Ref : ACL/MIS-OTH 220382

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
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Sample description : Received one (1) samples labelled as **Fertilizer Marking:**  
**Insect Frass Fertilizer Species Hermetia Illucens**

**Results of Analysis**

Parameter	Unit	Method	Results
Organic Nitrogen as N	mg/kg	APHA4500Norg-B, NH3-G	1,980
Ferric Iron	mg/kg	APHA3500Fe,3120	825

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